Mal J Nutr 15(1): 11 - 18, 2009

Factors Associated with Non-exclusive Breastfeeding among 4-Week Post-partum Mothers in Klang District, Peninsular Malaysia

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ABSTRACT

This is a cross-sectional study which investigated the association between non-exclusive breastfeeding and maternal, paternal, obstetric and infant factors. Data on maternal, paternal, obstetric and infant factors were collected through face-to-face interview using a structured questionnaire from 498 mothers with four-week-old infants who attended government clinics in Klang district between 17 and 28 July 2006. The prevalence of non-exclusive breastfeeding at four weeks was 45.8%. Factors significantly associated with non-exclusive breastfeeding at four weeks included Indian ethnic mother (OR = 4.06), working mother (OR = 3.55), mother from high household income (OR = 1.90), mother who smokes (OR = 7.27), primiparous (OR = 1.97), infant not sharing a bed with mother (OR = 1.75) and infant born prematurely (OR = 7.69). Identification of risk factors should assist in targeting women who are at increased risk of non-exclusive breastfeeding.

INTRODUCTION

The benefits of breastfeeding for both infant and mother are numerous and well documented (Brown *et al*., 1989; Popkin *et al.*, 1990; WHA, 2001). The greatest protective effect against infectious diseases for infants was observed with exclusive breastfeeding (Raisler, Alexander & O'Campo, 1999; WHO, 2001). Introduction of complementary foods should be delayed until the infant is six months old for maximum protection (Kramer & Kakuma, 2002). Thus, it is important to encourage mothers to breastfeed exclusively for the first one month of life (of infant) to ensure continued breastfeeding (WHA, 2001).

Although the breastfeeding rate in Malaysia tends to be high, the rate of exclusive breastfeeding before four months appears to have dropped from 29.0% in 1997 to 19.3% in 2006 (IPH, 1998; IPH, 2008). Therefore, it is important to identify factors that may hinder the maintenance of exclusive breastfeeding for women in Malaysia in order to provide opportunities for targeted interventions and improved breastfeeding programmes.

This study investigates the association between non-exclusive breastfeeding at 4 weeks and maternal, paternal, obstetric and infant factors.

METHODOLOGY

This was a cross-sectional study carried out between 17 July and 28 July 2006 involving 498 mothers of 4-week-old infants in Klang district.

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This study involved all eight government health clinics and nineteen community clinics in Klang district. Universal sampling was used in this study where all mothers with 4-week-old infants attending the clinics during the study period were included in the study. Mothers were excluded from the study if they were less than 18 years old, had a child or an infant with congenital malformation, and if the infant was not accompanied by the mother at the clinic.

On obtaining consent from eligible mothers, data was collected through a face-to-face interview using a pre-coded structured questionnaire. The interview was conducted by designated and trained staff nurses in each health and community clinic in the district. Bahasa Malaysia was used as the medium of interview since it is the national language and commonly used amongst the interviewers and respondents. The questionnaire and the interviewing nurses used standard terminology to ensure mothers' understanding. Data on maternal factors (age, ethnicity, educational level, working status, body mass index, household income, smoking and sharing bed with infant), paternal factors (age, ethnicity, educational level, working status and smoking), obstetric factors (parity, attend breastfeeding class, number of antenatal visits and mode of delivery) and infant factors (sex, gestational age and birth weight) were collected.

In this study, exclusive breastfeeding was defined as the infant having received only breast milk from the mother (either directly from the breast or expressed) and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines. A combination of breast-and-formula feeding and formula-only feeding were considered as 'non-exclusive breastfeeding'.

All data in the questionnaire were coded and entered into Statistical Package for the Social Sciences (SPSS) version 11.0. Variables were described using frequency distribution for categorical variables and mean with standard deviation for continuous variables. Variables were examined for associations with non-exclusive breastfeeding using univariate and multivariate logistic regression analysis. Crude odds ratio and adjusted odds ratio and their 95% confidence interval (95% CI) were reported. Walds *p*-value was calculated and a value of less than 0.05 was considered significant.

RESULTS

The maternal age ranged between 18 and 42 years with a mean age of 28.3 ± 5.1 years. The mean monthly household income was RM2, 089 ± 1,064. The majority of mothers belonged to the Malay ethnic group (57.0%), had less than diploma level of education (81.1%) and were not working (56.6%). Almost 88% of the infants had normal birth weight with slightly more male infants (53.4%) (Table1).

In this study, 45.8% of the infants were not breastfed exclusively at four weeks. Of 20 variables examined for potential association with non-exclusive breast-feeding at four weeks, eight independent variables reached statistical significance ($p < 0.05$) as shown in Table 2. For the categories within each variable, the number and row percentages of mothers who reported non-exclusive breastfeeding are given along with their respective univariate odds ratio (95% CI) indicating likelihood of non-exclusive breastfeeding. Variables examined but not significantly associated with non-exclusive breastfeeding included maternal age, education, body mass index; paternal age, ethnicity, education level, working status, smoking status; attend breastfeeding class, total number of antenatal visits, mode of delivery and infant sex.

Variables examined for individual associations with non-exclusive breast-feeding were likely to be interrelated. A

Table 1. Socio-demographic characteristics of respondents (n = 498)

Characteristics	*n*	*%*
Maternal age (years)		
< 30	322	64.7
≥ 30	176	35.3
Maternal ethnicity		
Malay	284	57.0
Chinese	82	16.5
Indian	110	22.1
Others	22	4.4
Maternal education level		
Less than Diploma	404	81.1
Diploma or higher	94	18.9
Maternal working status		
Not Working	282	56.6
Working	216	43.4
Household income (RM/ month)		
< 3,000	390	78.3
≥ 3,000	108	21.7
Infant birth weight (g)		
≥ 2,500	436	87.6
< 2,500	62	12.4
Infant gestational age (completed weeks)		
≥ 36	476	95.6
< 36	22	4.4
Infant sex		
Male	266	53.4
Female	232	46.6

multivariate logistic regression analysis was done to control for confounding effects and to enable identification of important variables to provide a more accurate explanation of the data. Table 3 shows the final model for non-exclusive breastfeeding at four weeks based on the 'Backward Log-Likelihood Ratio' method. Interaction test was performed among the variables in the final model and this showed no interactions. Factors significantly associated with non-exclusive breastfeeding at four weeks included Indian ethnic mother (adjusted OR=4.06, 95%CI: 2.41 , 6.84), working mother (adjusted OR= 3.55, 95% CI: 2.25 , 5.60), mother from household income of > RM3000 (adjusted OR=1.90, 95% CI: 1.04 , 3.45), mothers who smoke (adjusted OR=7.27, 95% CI: 1.26 , 55.53), primiparous mother (adjusted OR=1.97, 95% CI: 1.28, 3.05), infant not sharing bed with mother (adjusted OR=1.75, 95% CI: 1.02 , 3.01) and infant born prematurely (adjusted OR=7.69, 95% CI: 1.53, 38.67).

An ROC Curve was performed on the multivariate final model. The model had an area under the curve of 0.79 (95% CI: 0.74, 0.88). This means that the final model discriminates well between the stated variables (Park, Goo & Jo, 2004).

DISCUSSION

On the assumption that the more important associations between the variables examined and non-exclusive breastfeeding at four

Table 2. Numbers and odds ratio of not breastfeeding exclusively (at 4 weeks post-partum) by variables attaining significance in univariate logistic regression (n = 498)

Characteristics	*Not breastfeeding exclusively (n = 228)*			
	n	*% ***	*Unadjusted OR*	95% CI
Maternal factors				
Ethnicity				
Malay	102	35.9	1	-
Chinese	56	68.3	3.84	2.27, 6.49†
Indian	68	61.8	2.89	1.83, 4.55†
Others	2	9.1	0.18	0.04 , 0.78*
Working status				
Not working	92	32.6	1	-
Working	136	63.0	3.51	2.42 , 5.09†
Household income (RM/month)				
< 3,000	158	40.5	1	-
≥ 3,000	70	64.8	2.70	1.74 , 4.22†
Smoking				
No	208	43.7	1	-
Yes	20	90.9	12.79	2.97 , 55.10†
Parity				
Multiparous				
Primiparous	122106	39.655.8	11.92	-1.33 , 2.77†
Bed-sharing practice				
Yes	156	41.3	1	-
No	72	60.0	2.13	1.40 , 3.24†
Infant factors				
Gestational Age (weeks)				
≥ 36	208	43.7	1	-
< 36	20	90.9	12.79	2.97 , 55.10†
Birth weight (g)				
≥ 2,500	190	43.6	1	-
< 2,500	38	61.3	2.05	1.19 , 3.54*

* $p < 0.05$; † $p < 0.001$; OR = Odds Ratio ; CI = Confidence Interval
** Row percentage

weeks are those identified by multiple regression analyses, the discussion will focus on these findings.

This study showed that women of the Indian ethnic group were four times more likely not to breastfeed exclusively at four weeks compared to Malay women but this failed to show a significant association among Chinese women. A national report (MOH, 2007; IPH, 1998; IPH, 2008) and local studies on breastfeeding (Haaga, 1986; Manan, 1995; Chan & Asirvatham, 2001; Siah & Yadav, 2002; MOH, 2007) show that breastfeeding exclusively was least common among Chinese women. The inconsistency in the finding may reflect the increased and improved knowledge and practice of breastfeeding among the Chinese community in Malaysia through breast-feeding education and promotion in health clinics and hospitals.

Table 3. Adjusted odds ratio of not breastfeeding exclusively (at 4 weeks post-partum) for variables attaining significance in a multiple logistic regression (n = 498)

Characteristics	*Adjusted OR*	*95% CI*
Ethnicity		
Malay	1	-
Chinese	1.75	0.89 , 3.46
Indian	4.06	2.41 , 6.84†
Others	0.12	0.02 , 0.65*
Working status		
Not working	1	-
Working	3.55	2.25 , 5.60†
Household income (RM / month)		
< 3,000	1	-
≥ 3,000	1.90	1.04 , 3.45*
Smoking		
No	1	-
Yes	7.27	1.26 , 55.53*
Parity		
Multiparous	1	-
Primiparous	1.97	1.28 , 3.05*
Bed-sharing practice		
Yes	1	-
No	1.75	1.02 , 3.01*
Gestational age (weeks)		
≥ 36	1	-
< 36	7.69	1.53 , 38.67*

* $p < 0.05$; † $p < 0.001$; OR = Odds Ratio ; CI = Confidence Interval

Mothers who have a job were 3.5 times more likely not to exclusively breastfeed compared to non-working mothers. A similar finding was demonstrated by Chen (1981) and Ong, Yap & Foo (2001). The relationship between employment and breastfeeding is complex, and findings can differ depending on how and when employment status is measured. Most studies find a negative association between employment and breastfeeding, particularly the relationship between return to employment and shortened duration of breastfeeding (Bick, MacArthur & Lancashire, 1998; Lindberg, 1996) although timing and intensity of return to employment are facets that complicate this negative association (Lindberg, 1996).

Women from high household income were twice more likely not to exclusively breastfeed at four weeks compared to women from lower household incomes. This finding is supported by studies in developing countries (Haaga, 1986; Manan, 1995) but the reverse is true in developed countries (Forster, McLachlan & Lumley, 2006). In Malaysia, women from high household income families tend to employ maids to care for the needs of the family including the infant. It is postulated that this may have an impact on exclusive breastfeeding because the infant would be cared for and nursed by the maid with infant formula milk.

This study showed that mothers who smoke were seven times more likely not to exclusively breastfeed at four weeks

compared to non-smoking mothers. The negative association between maternal smoking and breastfeeding at four weeks has been reported by Ford & Labbok (1990) and Amir & Donath (2002). Liston (1998) suggested that some smoking women may decide against breastfeeding in order to reduce risk to their infants while Amir (2001) postulated that physiological and psychological factors played a role in shorter duration of exclusive breastfeeding among smokers compared to non smokers.

Primiparous women were twice more likely not to exclusively breastfeed at four weeks compared to multiparous women. This finding was in accordance with studies conducted in Kuala Lumpur (Chen, 1978) and Hong Kong (Leung, Tam & Hung, 2003). Mothers with their first child were less knowledgeable and skilful in breastfeeding. This caused low self-confidence among new mothers in wanting to breastfeed their infants (Aidam *et al.*, 2005; Butler *et al.*, 2004). In Eastern societies, it is common for mother-in-laws to accompany mothers during the confinement period especially after the first delivery. They are likely to influence the mother with their anti-breastfeeding ideas and thoughts (WHA, 2001).

Infants who do not sleep with their mothers at night were also twice as likely not to be exclusively breastfed compared to those who share the bed with their mothers. Despite indications that mothers may bed share for the purpose of breastfeeding, it is unclear whether bed-sharing is causally related to breastfeeding (McCoy *et al.*, 2004).

CONCLUSION

Several factors were identified to be independently, negatively, associated with exclusive breastfeeding at four weeks. Some of the factors (for example maternal smoking and working status) support previous studies while others were more specific to the community in Klang district and require further investigation within the Malaysia context. Health care providers should be alerted to circumstances that may lead to unsuccessful exclusive breastfeeding. As not all risk factors are modifiable, it is important to emphasise those that are, such as smoking and bed-sharing practice. Furthermore, mothers should be encouraged to lead healthier lifestyles and be educated on ways to reduce possible harm to their infants for greater success of exclusive breastfeeding among women in Malaysia.

ACKNOWLEDGEMENTS

The author gratefully acknowledges the assistance given by all the mothers in the study, the District Health Officer, Klang District Health Office and all the nurses. This study would not have been possible without their assistance.

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