Original Article

The Validity and Reliability of the Breastfeed Observation Aid in the Exclusive Breastfeeding Predictions at Six Weeks Postpartum

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Background: The World Health Organization has suggested that the health professional use the breastfeed observation aid for breastfeeding support. But there has not been any previous studies about the validity and reliability of the breastfeed observation aid in exclusive breastfeeding prediction.

Objective: To find the validity and reliability of the breastfeed observation aid and the cut-off point to predict exclusive breastfeeding at six weeks postpartum.

Materials and Methods: The breastfeed observation aid was translated to Thai. The validity was assessed by ten breastfeeding specialists. The reliability was tested by 130 singleton pregnant women who had delivered, without complications, at the HRH Princess Maha Chakri Sririndhorn Medical Center in the Nakhon Nayok province during the period of July 2014 to June 2015. The breastfeeding data at six-weeks postpartum were collected by follow-up done by telephone. The cut-off point of the breastfeed observation aid for the six-week breastfeeding prediction was calculated by the ROC curve.

Results: The exclusive breastfeeding rate at six weeks postpartum was 59.0%. The validity of the breastfeed observation aid was 93.2%. The intraclass correlation coefficient was 0.91(95% CI 0.88 - 0.94). The inter-rater reliability was 73.7%. The cut-off point to predict breastfeeding at six week was 15 points. The sensitivity and specificity of tests for six-week exclusive breastfeeding predictions were 90.3 and 74.0, respectively. The area below the curve was 0.61.

Conclusion: The breastfeed observation aid in the Thai version had good validity and reliability. It could be used to predict the exclusive breastfeeding rates at six weeks postpartum.

Keywords: Breastfeed observation aid, Validity, Reliability

Breastfeeding position is one of the important factors that help with appropiate latching and effective sucking[1,2]. If the infant has poor latching, the mother will have pain during infant feeding[3,4], the malificent effect is nipple and breast complications include cracked nipples, mastitis and abscesses. It is the reason the mother stops breastfeeding before the appropiate time[1,5,6]. Therefore, the health professional should observe the mother during infant infeeding with suggestions and aid for the mother to ensure good latching. The breastfeeding could continue without the obstacle of nipple and breast complications.

The breastfeed observation aid is a tool that has been used for good latching and effective sucking assessment. The World Health Organization has suggested that the health professional use the breastfeed observation aid for breastfeeding support. The breastfeed observation aid has the details for systematic assessment of the mother and infant during breastfeeding. In Thailand, most health professionals use LATCH scores for breastfeeding assessment[7-9]. There has not been any previous studies about the validity and reliability of the breastfeed observation aid in exclusive breastfeeding prediction. We are interested in studying the validity and reliability of the breastfeed observation aid and it's use in predicting breastfeeding duration.

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Materials and Methods
Design

The present study is a diagnostic test. The WHO breastfeed observation aid was translated to Thai. All of the aspects of the observed data were converted into points. The validity test was evaluated by ten breastfeeding specialists after the translation. The breastfeed observation aid was then used for breastfeeding assessment in the singleton postpartum women who delivered term infants without complications. Two nurses who had passed a breastfeed observation aid training program, which includes two hours of lecture and two hours of practice, were the breastfeed observation aid assessors. One pair of a mother and her infant was alternatively assessed in chronological order by two nurses. The nurses assessed the mothers and infants at 16-24 hours postpartum. The data of the breastfeed observation aid were compared with breastfeeding data which were routinely collected by the charge nurse at the postpartum ward. The intraclass correlation coefficient and the inter-rater reliability was analyzed. After discharge, telephone follow up was used to collect breastfeeding data at six weeks postpartum. The ROC curve and cut-off point for the breastfeeding prediction at six weeks postpartum were analyzed.

Setting

The study was performed in the Nakhon Nayok province, a rural area in the central part of Thailand. The data were collected during the period from July, 2014 to June, 2015 at the HRH Princess Maha Chakri Sririndhorn Medical Center which has a 'baby friendly' hospital policy. A routine practice in the postpartum ward is breastfeeding education. The one-hour course in breastfeeding includes latching and is taught on the first day postpartum. One nurse teaches a group of 3-5 mothers. The mothers were encouraged to stimulate their infants to feed 8-12 times per day. At the second day postpartum, the mothers and infants were discharged if they had no complications. Prior to discharge, the breastfeeding-recording notebook was given to the mother with an explanation of the "breastfeeding type" definition, postpartum symptoms and complications which might require further clinical counseling.

Inclusion criteria

The postpartum women who had normal deliveries without complications (i.e. multiple pregnancies, preeclampsia, antepartum hemorrhage and preterm labor) and intended to breastfeed for at least six months were recruited. Their infants had birth weights of more than 2,500 grams and were without complications. The mothers had suffered no acute postpartum hemorrhages and no contraindications to breastfeeding. This includes mothers who were HIV positive.

Exclusion criteria

The mothers whose infants were diagnosed with galactosemia.

Sample size

Before the study, we had collected data from twenty cases of a pilot study and analyzed the sensitivity and specificity of the breastfeed observation aid. The sensitivity and specificity were 0.85 and 0.80, respectively. We set a value of 20% as an acceptable error of sensitivity. The rate of exclusive breastfeeding was 60% and the p-value was at 0.05. The calculated sample size was 113 cases. The subjects were calculated with additional 15% for data loss. The total samples collected were 130.

Breastfeed observation aid

The breastfeed observation aid was translated into a Thai version. A score adaptation was done. The parameters were assessed including the mothers' and babies' general appearance, the mothers' breast condition, the babies' position, babies' attachment and suckling. The breastfeeding observation scores are total of 22 points. The details of breastfeed observation aid score were shown in Table 1.

Breastfeeding definitions and outcomes

The outcomes of the present study were the rates of exclusive breastfeeding and breastfeeding. Exclusive breastfeeding was defined as no other food or drink, including water; only breast milk and milk expressed. The infant was able to receive drops and syrups of vitamins, minerals and medicines and other ORS. Breastfeeding was defined as receiving breast milk either directly from the breast or milk expressed, but no food-based fluid, formula milk or other food.

The exclusive breastfeeding rates at six weeks postpartum were collected by follow-up via the telephone. The mother was taught to record breastfeeding and any fluids or foods which were given to the infant on a breastfeeding notebook given to the mother prior to discharge. Exclusive breastfeeding and breastfeeding results were answered by the mother

consistent with established definitions.

Ethical considerations

The present study was approved by The Ethics Committee of the Srinakharinwirot University, Faculty of Medicine.

Statistical analysis

Demographic data were reported in means and percentages. We analyzed the validity by a breastfeeding specialist's assessment of the breastfeed observation aid. The reliability was calculated as an intraclass correlation coefficient. The inter-rater reliability was calculated by Kappa. A cut-off point and ROC curve have been used to predict the exclusive breastfeeding or breastfeeding rates at six weeks postpartum. The correlation between the breastfeed observation aid scores at more than the cut-off point and exclusive breastfeeding or breastfeeding rates were analyzed by Chi-square, relative risk and a 95% confidence interval. A p-value of less than 0.05 was considered statistically significant. Statistical analysis

was performed using SPSS software (version 23.0, SPSS Incorporated).

Results

The numbers of postpartum women enrolled in our research project were 130. There was no mother whose infant was diagnosed with galactosemia. The mean maternal age was 28.6±6.1years. The percentage of primipara was 41.5. The mean gestational age was 38.3±0.9 weeks. The percentage of vaginal deliveries was 61.5. The mean blood loss was 345.5±235.6 milliliters. The mean body mass index was 25.2±4.1 kg/m². The mean nipple length was 1.1±0.3 centimeters. The mean birth weight was 3,098.9±347.3 grams. The percentage of infants with moderate to severe tongue-tie was 15.3. The details of the demographic data were shown in Table 2.

From the demographic data of the mothers and infants, the cesarean section rate in the present study was high (38.5%)[10]. The mother's body mass index has been categorized into an overweight group (24.9 kg/m²). The mean nipple length, within normal limits,

Table 1. Breastfeed observation aid score

| Parameter				Score		Score
General	Mother	-Mother looks healthy		1	-Mother looks ill or depressed	0
		-Mother relaxed and comfortable		1	-Mother looks tense and uncomfortable	0
		-Signs of bonding between mother and baby		1	-No mother/baby eye contact	0
	Baby	-Baby looks healthy		1	-Baby looks sleepy or ill	0
		-Baby calm and relaxed		1	-Baby is restless or crying	0
		-Baby reaches or roots for breast if hungry		1	-Baby does not reach or root	0
Breast		-Breast looks healthy		1	-Breast looks red, swollen or sore	0
		-No pain or discomfort		1	-Breast or nipple painful	0
		-Breast well supported with fingers away from nipple		1	-Breasts held with fingers on areola	0
		-Nipple protractile		1	-Nipple flat, not protractile	0
Baby's position		-Baby's head and body in line		1	-Baby's head and neck twisted to feed	0
		-Baby held close to mother's body		1	-Baby not held close	0
		-Baby's whole body supported		1	-Baby supported by head and neck only	0
		-Baby approaches breast, nose to nipple		1	-Baby approaches breast, lower lip/chin to nipple	0
Baby's attachment		-More areola seen above baby's top lip		1	-More areola seen below bottom lip	0
		-Baby's mouth open wide		1	-Baby's mouth not open wide	0
		-Lower lip turned outwards		1	-Lips pointing forward or turned in	0
		-Baby's chin touches breast		1	-Baby's chin not touching breast	0
Suckling		-Slow, deep sucks with pauses		1	-Rapid shallow sucks	0
		-Cheeks round when suckling		1	-Cheeks pulled in when suckling	0
		-Baby releases breast when finished		1	-Mother takes baby off the breast	0
		-Mother notices signs of oxytocin reflex		1	-No signs of oxytocin reflex noticed	0
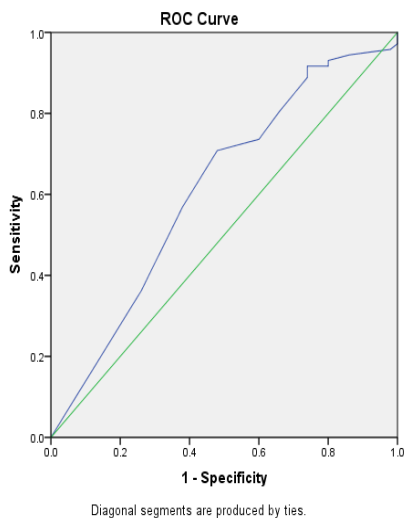
Figure 1. ROC curve of exclusive breastfeeding prediction at six weeks postpartum.
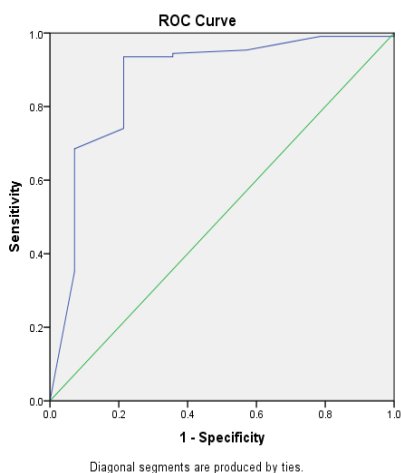

Figure 2. ROC curve of breastfeeding prediction at six weeks postpartum.

was 1.1±0.3 centimeters[11]. The incidence of moderate to severe tongue-tie was high (15.3%) and frenotomies were done in this group prior to discharge[12].

At six weeks postpartum, one hundred and twenty two cases completed the follow-up. The percentage of mothers with exclusive breastfeeding was 59.0 (72 cases). The percentage of mothers who had breastfed was 88.5 (108 cases).

The validity of the breastfeed observation aid was 93.2. The intraclass correlation coefficient was 0.91 (95% CI 0.88-0.94). The inter-rater reliability was 73.7. The cut-off point of the breastfeed observation aid's

score was 15 points as taken from the ROC curve. The sensitivity and specificity of exclusive breastfeeding prediction at six weeks postpartum were 90.3% and 74.0%, respectively. The area under curve was 0.61. The sensitivity and specificity of breastfeeding prediction at six weeks postpartum were 90.7% and 18.8%, respectively. The area under curve was 0.88. The ROC curves were shown in Figure 1 and 2.

We categorized the mother in two groups by the cut-off point of the breastfeed observation aid. When breastfeeding data were compared between the two groups, the mothers with the breastfeed observation aid who scored 15 or more had an exclusive breastfeeding rate 1.8 times more than the mothers with a breastfeed observation aid score of less than 15 (95%CI 1.1-2.4). The mothers with breastfeed observation aid score of 15 or more had breastfeeding rates 2.4 times more than the mothers with breastfeed observation aid scores less than 15 (95%CI 1.4-3.9).

Discussion

The validity and reliability of the breastfeed observation aid were high (the validity = 93.2% and an intraclass correlation coefficient = 0.91). Clinical application was possible. In addition, the correlation between two assessors was in agreement, substantially (73.7%). When the breastfeed observation aid was used for breastfeeding prediction; the cut-off point was 15. The accuracy of the breastfeeding prediction was greater than the accuracy of exclusive breastfeeding

Table 2. The demographic data of mother and infant

Mother and infant's data	Mean and percentage
age (years)	28.6±6.1
para n (%)	
-primipara	54(41.5)
-multipara	76(58.5)
gestational age (weeks)	38.3±0.9
route of delivery n (%)	
-normal delivery	78(60.0)
-vacuum delivery	2(1.5)
-cesarean section	50(38.5)
blood loss (milliliters)	345.5±235.6
body mass index (kg/m²)	25.2±4.1
nipple length (centimeters)	1.1±0.3
birth weight (grams)	3098.9±347.3
tongue-tie n (%)	
-mild	22(16.9)
-moderate	15(11.5)
-severe	5(3.8)

prediction (88% vs. 61%). The sensitivity of the breastfeeding and exclusive breastfeeding predictions were similarly high (90.7% vs. 90.3%) but the specificity of exclusive breastfeeding prediction was more than in the specificity of breastfeeding prediction (74.0% vs.18.8%). Therefore the breastfeed observation aid could be use as a screening tool for exclusive breastfeeding prediction at six weeks postpartum as the sensitivity and specificity were high and statistical significant differences between the breastfeeding observation scores of 15 or more and less than 15. If the mother and infant have a breastfeed observation aid score less than 15, the health professionals should give close support and follow-up. Breastfeeding prediction at six weeks postpartum could be done by LATCH scores according to the study of Kumar et al [13]. The cut-off point of LATCH scores more than 8 had a 75% sensitivity and 63.2 specificity. When the breastfeed observation aid has been used for breastfeeding prediction in comparison to LATCH scores, the breastfeed observation aid had sensitivity and specificity greater than those seen in the LATCH scores. In addition, the breastfeed observation aid could be used for exclusive breastfeeding predictions but LATCH scores could only be used for overall breastfeeding predictions. The exclusive breastfeeding is of interest and is campaigned globally. The exclusive breastfeeding prediction characteristic of the breastfeed observation aid is likely beneficial.

The strength of the present study was that the breastfeeding data at six weeks postpartum were recorded in a breastfeeding notebook. The breastfeeding definition in the notebook was explained by a nurse prior to the mother's discharge. This decreased data error and recall bias. However, the small sample size was a limitation in the present study.

Conclusion

The breastfeed observation aid in the Thai version has shown a high validity and reliability. The score adaptation of the breastfeed observation aid can predict the exclusive breastfeeding rates at six weeks postpartum. The sensitivity was 90% and the specificity was 74% at the cut-off score of 15.

What is already known on this topic?

The World Health Organization has suggested that the health professional use the breastfeed observation aid for breastfeeding support. But there has not been any previous studies about the validity and reliability of the breastfeed observation aid in exclusive breastfeeding prediction.

What this study adds?

The validity of the breastfeed observation aid was 93.2%. The intraclass correlation coefficient was 0.91 (95% CI 0.88-0.94). The inter-rater reliability was 73.7%. The sensitivity and specificity of tests for six weeks exclusive breastfeeding predictions were 90.3 and 74.0, respectively. The cut-off point was 15 points.

Potential conflicts of interest

The authors declare no conflicts of interest.

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