Development and validation of the Malay version knowledge and attitude questionnaire on breastfeeding among postpartum mothers in the northeast region of Peninsular Malaysia

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ABSTRACT

Introduction: Knowledge and attitude are important modifiable factors influencing exclusive breastfeeding practice. A valid and reliable questionnaire is needed to assess the knowledge and attitude among mothers towards breastfeeding. This study aims to develop and validate a Malay version Knowledge and Attitude Breastfeeding Questionnaire (KA-BFQ) and to describe the breastfeeding knowledge and attitude among postpartum mothers in Hospital Universiti Sains Malaysia. **Materials and Methods:** A cross-sectional validation study was conducted from the 1st October 2014 to 31st December 2014 among postpartum mothers who delivered vaginally to healthy infants and were able to initiate breastfeeding while in the postnatal ward. The interviewer-guided KA-BFQ contains 47 items assessing knowledge and 23 items assessing attitude were given. The questions on knowledge were adapted from previous study while questions on attitude were developed in stages for content validity. Face validity, item level characteristics and analysis, exploratory factor analysis, internal consistency reliability, and descriptive analysis of respondents' knowledge and attitude were conducted. **Results:** A total of 150 postpartum mothers with mean age of 28.04 (SD 4.97) years participated in this study. Item analysis showed acceptable difficulty index with excellent discrimination index. Exploratory factor analysis constructed for knowledge domain leaving 41 items loaded from 0.19 to 0.82 and 11 items for attitude domain loaded from 0.53 to 0.86. Cronbach's alpha of the final questionnaire was 0.85 for knowledge and 0.79 for attitude. The mean total score was 29.34 (SD 6.23) for knowledge and 44.16 (SD 4.26) for attitude. **Conclusion:** The Malay version KA-BFQ is a valid and reliable tool to assess the breastfeeding knowledge and attitude among postpartum mothers.

Keywords: Breastfeeding, knowledge, attitude, validity, reliability, questionnaire study

INTRODUCTION

The World Health Organisation (WHO) recommends infants to be exclusively breastfed for the first six months of life and continue up to two years, with complimentary food introduced at the age of six months. [1, 2] Breastfeeding provides many benefits to the infant, mother and family, including infant's protection against diarrhoeal diseases, respiratory infection, overweight and obesity, and mother's protection against postpartum haemor-

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rhage and short birth spacing. [3]

In spite of the well-recognised importance of exclusive breastfeeding, the practice is not widespread, both globally and in Malaysia. Although exclusive breastfeeding rate among infants aged six months attending government health clinics in Malaysia had increased to 23.3% [4] in 2011 from 14.5% [5] in 2006 but the rate is still far below the standard recommendation. The knowledge and attitude are important modifiable factors that may improve exclusive breastfeeding practice. The knowledge about the benefits, technique of breastfeeding and problem with breastfeeding are very essential for successful breastfeeding practice while poor attitude contribute to the failure of breastfeeding. [6, 7]

Breastfeeding intervention programme among postpartum mothers may be carried out to contribute to the change of general knowledge and attitudes towards breastfeeding especially among postpartum mothers with poor knowledge and negative attitude in order to promote breastfeeding and to facilitate a longer duration of breastfeeding. For mothers with good knowledge and positive attitude, continuous support should be given to ensure good breastfeeding practices. [8] Identifying specific knowledge gap by using a questionnaire may facilitate a focused breastfeeding promotion strategy, in order to complement the existing program in our country. It may also become a valuable tool to monitor the effectiveness of such strategy, by using the questionnaire to assess the knowledge before and after the intervention.

In order to assess the knowledge and attitude, questionnaire can be used as an instrument since it is a systematic and standardised measurement for data collection. [9] There are some existing validated tools assessing knowledge, attitude, confidence, self-efficacy, or satisfaction towards breastfeeding such as the Modified Breastfeeding Evaluation Scale, the Breastfeeding Attrition Prediction Tool, and the Breastfeeding Self-Efficacy Scale. [10]

Validity of an instrument refers to the appropriateness, meaningfulness and usefulness of the specific inferences made from the test score. [11] Measurement validity shows how close the data reflect the true state of what is being measured. [12] Cronbach's alpha coefficient is a common way to indicate internal consistency reliability of a construct. The item analysis is considered satisfactory if the Cronbach's alpha value was 0.7 or above. [13]

It is important to have a valid and reliable questionnaire that is appropriate with the local culture to understand about breastfeeding in Malaysia. There are limited tools on this issue, particularly assessing the knowledge and attitude among postpartum mothers. This study aims to develop and validate a Malay version knowledge and attitude questionnaire on breastfeeding and to describe the breastfeeding knowledge and attitude among postpartum mothers in Hospital USM.

MATERIALS AND METHODS

A cross-sectional validation study was conducted from 1st October 2014 to 31st December 2014 among postpartum mothers who delivered vaginally to healthy infants and were able to initiate breastfeeding while in the Hospital USM postnatal ward. Mothers with infants admitted to neonatal ward were excluded. The Human Research Ethics Committee, USM approved the study protocol on 17th September 2014 (USM/JEPeM/140391).

The sample size estimation for knowledge and attitude domains was based on sample to variable ratio (N:p ratio) of 3:1. [14] Since there were 47 items in knowledge questionnaire, the sample size was 141 and 23 items in attitude domain, the sample size

was 46. The final sample size for the study was 155, the largest sample size for knowledge domain and in adding up 10% of the non-response rate. The sample size was calculated for each knowledge and attitude domains since exploratory factor analysis (EFA) was analysed separately. On every data collection day, a systematic sampling was used to select the respondents from the previous day admission list to the post-natal ward.

The Malay version Knowledge and Attitude Breastfeeding Questionnaire (KA-BFQ) consist of three parts; socio-demographic details, knowledge items and attitude items. A team comprised of public health physician, breastfeeding consultant, breastfeeding counselor, nutritionist and biostatistician were involved in the development of the Malay version KA-BFQ.

The items of knowledge were adapted from a Malay version breastfeeding knowledge questionnaire validated among female university staff, containing 47 items with factor loading range of 0.2 to 0.88 and Cronbach's alpha of 0.77. [15] There were 10 sub-domains with three options of "true", "unsure" and "false". The sub-domains were covering the breastfeeding knowledge on advantages of breastfeeding to baby and mother, colostrums, effective feeding, breast milk expression, duration of feeding, complementary feeding, problem with breastfeeding, breast engorgement and practical aspect of breastfeeding. A correct answer scored as "1", whereas an incorrect or unsure answer scored as "0". Items with reverse statements (23 items) were scored accordingly.

The items on attitude were developed in stages. The first stage involved searching the literature that is most suitable for our population of study followed by series of discussions with the team members to discuss the items and verified its content validity. The preliminary questionnaire assessing attitude contained 23 items distributed over three sub-domains which were cognitive, affective and behavioural aspects of attitude. Respondents answered using five-point Likert-scales from "strongly agree", "agree", "unsure", "disagree" to "strongly disagree". The score of attitude was recorded from 1 to 5, however for items with negatively arranged responses, the scores were reversed. Therefore, all items with higher scores reflected a more positive response to attitude towards breastfeeding. The scores for each item on the knowledge and attitude domains were summed to create an overall score for each domain, respectively.

The data was collected in the postnatal ward via interviewer-guided by a single interviewer. Written informed consent was taken prior to data collection. A standardized interview was conducted for each respondent to ensure that the differences in the answers given were not contributed by the conduct of the interview. However, the interview could be flexible and adapted as it progresses but the content of the questionnaire was fixed. This was applicable in this study because the target population was postpartum mothers who might have babies with them during interview sessions. The interview session took about 30 to 40 minutes for each respondent.

A pretest was conducted for face validity to determine the degree of clarity and comprehension of each item to the measured domains. Fifteen postpartum mothers from Hospital USM postnatal ward were conveniently selected to answer the Malay version KA-BFQ for face validity. Respondents answered using five-point Likert-scales from "the sentence is very vague", "the sentence is vague", "the sentence is acceptably clear", "the sentence is clear" to "the sentence is very clear" for determining the clarity of the items, with scoring of 1 to 5. A five-point Likert-scales from "the sentence is very difficult to be understood", "the sentence is difficult to be un-

derstood", "the sentence is very acceptably to be understood", "the sentence is easy to be understood" to "the sentence is very easy to be understood" is used for determining the comprehension of the items, with similar scoring as those used in determining the clarity. Face Validity Index (FVI) was calculated in which FVI-Clarity (mean sum of score of clarity of all items divided by maximum scores of items) added with FVI-Comprehension (mean sum of score of comprehension of all items divided by maximum scores of items) divided by two. The FVI of 0.8 was recommended. [16, 17]

Item level characteristics of each item in each domain were assessed in term of descriptive statistics. The knowledge data was then estimated by item analysis to explore the quality of items. In the item analysis, difficulty index and discrimination index were determined. The difficulty index was the ratio of correct response to the total number of respondents. An item was considered difficult when the difficulty index value was <0.3 and considered easy when the index was >0.7 and the value of 0.3 to 0.7 was acceptable. [18] The item discrimination was a numerical indicator of how poorer respondents answered the items as compared to how the better respondent answered. Items with a discrimination index of 0.25 to 0.35 were considered good and those with indices more than 0.35 were excellent. [19]

In determining the construct validity, EFA was done separately for knowledge and attitude domain. For extraction method, the principal component method was used. The Keiser-Meyer-Olkin (KMO) was computed to test the partial correlation among items to ensure the sampling adequacy and to test whether the variables in the samples were adequate to correlate. [20] When the items shared common factors, KMO would be higher and vice versa. It was worthwhile to run factor analysis only when there were common factors among the items. The KMO of >0.7 was middling to factor the items. [21] Item selection was based on communalities, correlation and factor loading values. For removing items in this study, items with communalities <0.3 (30%) and items with factor loading of <0.5 were removed because the factor loadings were ideally >0.5 as recommended by Hair Jr *et al*. [22-25] However, some items were retained in the questionnaire for content validity even though the items do not meet any criteria above.

The reliability of the Malay version KABFQ was examined for both domains by assessing the internal consistency. Cronbach's alpha was used to determine the internal consistency reliability in this study. Cronbach's alpha of 0.7 or higher was an acceptable value to achieve a good internal consistency.[26] The values were computed for each domain produced in the final factor analysis. In addition to the validity and reliability analysis, a descriptive analysis of the respondents' knowledge and attitude was also conducted. The mean scores of knowledge and attitude were calculated separately by adding all the individual respondents' scores and divided by total number of respondents. The statistical analyses were conducted using IBM SPSS version 22.0.

RESULTS

Socio-demographic characteristics: There were 175 respondents who fulfilled the inclusion criteria. Ten respondents were discharged early, ten respondents refused to participate and five respondents refused to complete the interview. Finally, 150 respondents were included in the study analyses (the response rate was 85.7%). The mean age of respondents was 28.04 (SD 4.97, range 16-40) years with the majority were Malay, Muslim and married. Half of them were housewife and they attained tertiary education (Table 1).

Face validity: The FVI was 0.83 for know-

Table 1: Demographics of participants.

Variables	Frequency (%)
Race	
Malay	149 (99.3)
Non-Malay	1 (0.7)
Religion	
Muslim	149 (99.3)
Buddha	1 (0.7)
Marital status	
Married	148 (98.7)
Unmarried	2 (1.3)
Educational level	
None/ Primary school	7 (4.7)
Secondary school	65 (43.3)
Tertiary education	78 (52.0)
Occupation	
Housewife	84 (56.0)
Self-employed	5 (3.3)
Government sector	45 (30.0)
Private sector	16 (10.7)

ledge domain and 0.98 for attitude domain (Table 2). None of the respondents had any difficulties in understanding the items in the questionnaire and they agreed that the issues covered in the questionnaire were culturally accepted.

Item level descriptive statistics and item analysis of knowledge domain: All respondents answered all the items in the questionnaire. Difficulty index was only applicable for knowledge domain. Among 47 items, one item had a difficulty index of <0.3. Half (55.0%) of the questions were easy questions, difficulty index >0.7 whereas others were acceptable. Majority of the items showed excellent discrimination (Table 3).

Item level descriptive statistics of attitude domain: For attitude domain, the item with the highest mean score (4.54, SD 0.95) was "Exclusive breastfeeding is easier than formula feeding". The mean scores of the attitude domain ranged from 3.14 to 4.57 (Table 4).

Table 2: Face validity of Malay version KA-BFQ (n=15).

	FVI-Clarity	FVI-Comprehension	FVI-Total
Knowledge	0.93	0.73	0.83
Attitude	0.98	0.98	0.98

FVI: Face validity index

Exploratory factor analysis (EFA) and reliability analysis: For knowledge domain, the initial solution showed Kaiser-Meyer-Olkin (KMO) of 0.64 and Bartlett's test of Sphericity was significant (p<0.001) with 17 components were suggested by eigenvalues. Based on sub-domains in previous study, the components were reduced to 10. Six items were removed sequentially due to factor loading of <0.5. Ten items were kept although their factor loading were <0.5 for content validity. Finally, only 41 items remain in final analysis loaded from 0.19 to 0.82.

In the EFA of attitude domain, the initial solution showed KMO of 0.79 and Bartlett's test of Sphericity was significant (p<0.001) with six components were suggested by eigenvalues. However, a fixed three components was used because attitude domain questionnaire was developed by categorizing into three sub-domains: cognitive, affective and behavioural. Three items were removed sequentially due to low communalities (<0.3) while nine items were removed sequentially due to factor loading of <0.5. Finally, only 11 items remain in final analysis loaded from 0.53 to 0.86.

Cronbach's alpha of the final questionnaire was 0.85 for knowledge and 0.79 for attitude. Tables 5 and 6 showed construct validity and internal consistency reliability for knowledge and attitude domain. By using the final questionnaire, the mean total score for knowledge was 29.34 (SD 6.23) while for attitude was 44.16 (SD 4.26).

DISCUSSION

Many infants were given exclusive breastfeeding for a short duration after delivery. A prospective cohort study conducted in Kelantan showed the percentage of exclusive breastfeeding at one month after delivery was only

Table 3: Item level descriptive analysis and item analysis of difficulty index and discrimination index of each item in knowledge domain in the Malay version KA-BFQ (n=150).

Items	n (%)			Correct Response Value	Difficulty Index	Discrimination Index
	True	False	Unsure	Frequency (%)		
Advantages to baby						
K_Q1	123 (82.0)	4 (2.7)	23 (15.3)	123 (82.0)	0.82	0.52
K_Q7*	3 (2.0)	141 (94.0)	6 (4.0)	141 (94.0)	0.94	0.48
K_Q12	145 (96.7)	2 (1.3)	3 (2.0)	145 (96.7)	0.97	0.47
K_Q16*	6 (4.0)	137 (91.3)	7 (4.7)	137 (91.3)	0.91	0.46
K_Q19	111 (74.0)	18 (12.0)	21 (14.0)	111 (74.0)	0.74	0.52
K_Q35*	2 (1.3)	140 (93.3)	8 (5.4)	140 (93.3)	0.93	0.49
Advantages to mother						
K_Q4	140 (93.3)	7 (4.7)	3 (2.0)	140 (93.3)	0.93	0.45
K_Q8	114 (76.0)	15 (10.0)	21 (14.0)	114 (76.0)	0.76	0.62
K_Q13	129 (86.0)	4 (2.7)	17 (11.3)	129 (86.0)	0.86	0.50
K_Q10	118 (78.7)	12 (8.0)	20 (13.3)	118 (78.7)	0.79	0.55
K_Q15*	11 (7.3)	131 (87.3)	8 (5.4)	131 (87.3)	0.87	0.58
K_Q25*	7 (4.7)	119 (79.3)	24 (16.0)	119 (79.3)	0.79	0.54
Colostrum						
K_Q2*	12 (8.0)	94 (62.7)	44 (29.3)	94 (62.7)	0.63	0.57
K_Q9	116 (77.3)	3 (2.0)	31 (20.7)	116 (77.3)	0.77	0.57
K_Q14*	9 (6.0)	103 (68.7)	38 (25.3)	103 (68.7)	0.69	0.61
K_Q20*	18 (12.0)	83 (55.3)	49 (32.7)	83 (55.3)	0.55	0.51
Effective feeding						
K_Q5	149 (99.3)	1 (0.7)	0 (0.0)	149 (99.3)	0.99	0.39
K_Q17	149 (99.3)	1 (0.7)	0 (0.0)	149 (99.3)	0.99	0.41
K_Q18	146 (97.3)	0 (0.0)	4 (2.7)	146 (97.3)	0.97	0.45
Breast milk expression						
K_Q6	86 (57.3)	3 (2.0)	61 (40.7)	86 (57.3)	0.57	0.40
K_Q11*	13 (8.7)	110 (73.3)	27 (18.0)	110 (73.3)	0.73	0.53
K_Q21*	10 (6.7)	133 (88.7)	7 (4.6)	133 (88.7)	0.89	0.50
K_Q23	50 (33.3)	29 (19.3)	71 (47.4)	50 (33.3)	0.33	0.40
K_Q27*	30 (20.0)	76 (50.7)	44 (29.3)	76 (50.7)	0.51	0.55
K_Q31	63 (42.0)	14 (9.3)	73 (48.7)	63 (42.0)	0.42	0.45
K_Q33*	19 (12.7)	69 (46.0)	62 (41.3)	69 (46.0)	0.46	0.44
K_Q39*	20 (13.3)	86 (57.3)	44 (29.4)	86 (57.3)	0.57	0.36
Duration of feeding						
K_Q22	131 (87.3)	7 (4.7)	12 (8.0)	131 (87.3)	0.87	0.50
K_Q29	94 (62.7)	49 (32.7)	7 (4.6)	94 (62.7)	0.63	0.45
K_Q30	83 (55.3)	26 (17.3)	41 (27.4)	83 (55.3)	0.55	0.33
K_Q36	89 (59.3)	18 (12.0)	43 (28.7)	89 (59.3)	0.59	0.59
Complementary feeding						
K_Q26*	65 (43.3)	64 (42.7)	21 (14.0)	64 (42.7)	0.43	0.32
K_Q32	135 (90.0)	5 (3.3)	10 (6.7)	135 (90.0)	0.90	0.48
Problem with breastfeeding						
K_Q3*	30 (20.0)	95 (63.3)	25 (16.7)	95 (63.3)	0.63	0.44
K_Q24*	26 (17.3)	103 (68.7)	21 (14.0)	103 (68.7)	0.69	0.52
K_Q28*	40 (26.7)	75 (50.0)	35 (23.3)	75 (50.0)	0.50	0.35
K_Q37*	8 (5.3)	135 (90.0)	7 (4.7)	135 (90.0)	0.90	0.54
K_Q47*	20 (13.3)	118 (78.7)	12 (8.0)	118 (78.7)	0.79	0.51
Breast engorgement						
K_Q34	46 (30.7)	48 (32.0)	56 (37.3)	46 (30.7)	0.31	0.28
K_Q40	56 (37.3)	12 (8.0)	82 (54.7)	56 (37.3)	0.37	0.11
Practical aspect of breastfeeding						
K_Q38*	26 (17.3)	95 (63.3)	29 (19.4)	95 (63.3)	0.63	0.39
K_Q41	121 (80.7)	9 (6.0)	20 (13.3)	121 (80.7)	0.81	0.52
K_Q42	120 (80.0)	13 (8.7)	17 (11.3)	120 (80.0)	0.80	0.51
K_Q43*	23 (15.3)	104 (69.3)	23 (15.4)	104 (69.4)	0.69	0.53
K_Q44*	136 (90.7)	3 (2.0)	11(7.3)	3 (2.0)	0.02	0.01
K_Q45	118 (78.7)	6 (4.0)	26 (17.3)	118 (78.7)	0.79	0.51
K_Q46*	22 (14.7)	117 (78.0)	11 (7.3)	117 (78.0)	0.78	0.56

* Reverse-scored

54.4% that was far below the recommended exclusive breastfeeding duration. [27] In Kuching, among mothers who were not practicing exclusive breastfeeding until six months, 20.5% of them only practiced for less than one month after delivery. [28]

Good knowledge and attitude are needed towards successful breastfeeding. Mothers need to know the skills and advantages of breastfeeding so that they can continue to feed their infants and keep up their milk supply. Poor attitude and practice contributed to the failure of breastfeeding that can be influenced by the people around the mother and culture. [6, 7]

A questionnaire is one of the epidemiology's most valuable tool. In addition to the breastfeeding education received antenatally, it is important for postpartum mothers to have the knowledge of breastfeeding and positive attitude in order to achieve exclusive breastfeeding to their infants. Thus, the Malay version KA-BFQ was developed and validated as a baseline for planning the health education for postpartum mothers. The aim of validation of a questionnaire was to assess its ease of comprehension, relevance to intended topics, effectiveness in providing useful information and the degree to which the questions are interpreted and understood by different individuals.[29] The Malay version KA-BFQ used

Table 4: Item level descriptive analysis of each item in attitude domain in the Malay version KA-BFQ (n=150).

Items	Mean (SD)	n (%)				
		Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Cognitive						
A_Q1	4.54 (0.61)	87 (58.0)	60 (40.0)	0 (0.0)	3 (2.0)	0 (0.0)
A_Q3*	3.79 (0.86)	4 (2.7)	13 (8.7)	12 (8.0)	103 (68.6)	18 (12.0)
A_Q6	3.99 (0.89)	41 (27.3)	83 (55.3)	11 (7.4)	14 (9.3)	1 (0.7)
A_Q7*	3.26 (0.91)	0 (0.0)	41 (27.3)	35 (23.4)	68 (45.3)	6 (4.0)
A_Q8	3.42 (0.94)	13 (8.7)	71 (47.3)	33 (22.0)	32 (21.3)	1 (0.7)
A_Q11*	4.08 (0.63)	1 (0.7)	5 (3.3)	3 (2.0)	113 (75.3)	28 (18.7)
A_Q19	4.40(0.54)	63 (42.0)	85 (56.6)	1 (0.7)	1 (0.7)	0 (0.0)
A_Q18*	3.65 (0.78)	1 (0.6)	12 (8.0)	39 (26.0)	85 (56.7)	13 (8.7)
Affective						
A_Q2	4.29 (0.73)	60 (40.0)	79 (52.6)	6 (4.0)	4 (2.7)	1 (0.7)
A_Q4*	3.65 (0.83)	2 (1.3)	20 (13.4)	14 (9.3)	106 (70.7)	8 (5.3)
A_Q10*	4.13 (0.61)	0 (0.0)	4 (2.7)	7 (4.7)	104 (69.3)	35 (23.3)
A_Q12*	4.22 (0.49)	0 (0.0)	1 (0.7)	2 (1.3)	110 (73.3)	37 (24.7)
A_Q13*	4.31 (0.53)	0 (0.0)	1 (0.7)	2 (1.3)	96 (64.0)	51 (34.0)
A_Q14*	3.57 (0.95)	0 (0.0)	28 (18.7)	29 (19.3)	72 (48.0)	21 (14.0)
A_Q15*	4.03 (0.61)	0 (0.0)	7 (4.7)	5 (3.3)	115 (76.7)	23 (15.3)
A_Q16	4.42 (0.63)	71 (47.3)	74 (49.4)	2 (1.3)	3 (2.0)	0 (0.0)
Behavioural						
A_Q5*	3.65 (0.85)	0 (0.0)	29 (19.4)	3 (2.0)	110 (73.3)	8 (5.3)
A_Q9	4.13 (0.51)	28 (18.7)	115 (76.7)	5 (3.3)	2 (1.3)	0 (0.0)
A_Q17	3.66 (1.06)	29 (19.3)	78 (52.0)	7 (4.7)	35 (23.3)	1 (0.7)
A_Q20*	3.66 (0.85)	0 (0.0)	26 (17.3)	10 (6.7)	103 (68.7)	11 (7.3)
A_Q21*	3.88 (0.67)	0 (0.0)	13 (8.6)	4 (2.7)	121 (80.7)	12 (8.0)
A_Q22*	3.92 (0.65)	0 (0.0)	12 (8.0)	2 (1.3)	122 (81.4)	14 (9.3)
A_Q23	3.14 (0.96)	5 (3.3)	64 (42.7)	29 (19.3)	51 (34.0)	1 (0.7)

* Reverse-scored

true-false format for measuring the knowledge of postpartum mothers on breast-feeding and "unsure" option was available in purpose to minimise the perceived threat of the questions and to decrease the tendency of guessing among them. [30] The Likert scale was used for items in the attitude domain. The advantages of using Likert scale is to allow for degrees of opinion. [31]

A face validation in this study showed that the items measured in each domain were clear and comprehensive. Face validity was an inferior form of validity. It made the weakest of all possible arguments for interpretive meaning. [32] In addition, the respondents had the opportunity to ask any kind of uncertainty and appropriate correction was made to produce the final questionnaire.

Item analysis is a process which examines respondent responses to individual test items in order to assess the quality of those items and of the questionnaire as a whole. The Malay version KA-BFQ is a moderately difficult and excellently discriminate questionnaire.

The basis in factor analysis was the determination of the number and nature of factors that were responsible for correlations among items. [33] With regards to the factor analysis procedure, items which possess similar characteristics will be grouped together under one component. EFA for knowledge domain of the Malay version KA-BFQ showed similar results with previous study conducted among female staff working at the USM Health Campus. [15] It suggested that the questionnaires were valid and reliable in

Table 5: Construct validity and internal consistency reliability for knowledge domain (n=150).

Items	Factor loading	Components	Cronbach's Alpha	Overall Cronbach's Alpha
K_Q1	0.607	Advantages to baby	0.24	**0.85**
K_Q7*	0.622			
K_Q12	0.185			
K_Q16*	0.228			
K_Q19	0.680	Advantages to mother	0.64	
K_Q4	0.504			
K_Q8	0.750			
K_Q10	0.634			
K_Q13	0.634			
K_Q15*	0.541			
K_Q25*	0.576	Colostrum	0.77	
K_Q2*	0.766			
K_Q9	0.763			
K_Q14*	0.819			
K_Q20*	0.724			
K_Q5	0.459	Effective feeding	0.03	
K_Q17	0.459			
K_Q18	0.772			
K_Q6	0.385	Breast milk expression	0.65	
K_Q11*	0.604			
K_Q23	0.632			
K_Q27*	0.688			
K_Q31	0.596	Duration of feeding	0.33	
K_Q33*	0.687			
K_Q22	0.706			
K_Q29	0.545			
K_Q36	0.706			
K_Q26*	0.713	Complementary feeding	0.03	
K_Q32	0.713			
K_Q3*	0.679	Problem with breastfeeding	0.47	
K_Q24*	0.679			
K_Q28*	0.400			
K_Q37*	0.663			
K_Q47*	0.633	Breast engorgement	0.26	
K_Q34	0.765			
K_Q40	0.765			
K_Q41	0.711	Practical aspect of breastfeeding	0.46	
K_Q42	0.424			
K_Q43*	0.544			
K_Q45	0.571			
K_Q46*	0.549			

* Reverse-scored

these two groups of population. Factor loadings for attitude domain ranged from 0.54 to 0.86 with Cronbach's alpha of 0.79. A value

Table 6: Construct validity and internal consistency reliability for attitude domain (n=150).

Items	Factor loading	Components	Cronbach's Alpha	Overall Cronbach's Alpha
A_Q1	0.768	Cognitive	0.52	0.79
A_Q8	0.694			
A_Q19	0.543			
A_Q10*	0.537			
A_Q12*	0.835	Affective	0.76	
A_Q13*	0.864			
A_Q15*	0.594			
A_Q5*	0.532	Behavioural	0.70	
A_Q20*	0.714			
A_Q21*	0.779			
A_Q22*	0.738			

* Reverse-scored

of more than 0.6 would be acceptable in EFA.[34]

By using this valid and reliable questionnaire, the respondents' mean total knowledge and attitude scores were above the median scores for knowledge and attitude towards breastfeeding. It indicated that they had good knowledge and positive attitude towards breastfeeding.

In conclusion, our Malay version KA-BFQ is a valid and reliable measurement tool to assess the breastfeeding knowledge and attitude among postpartum mothers in Hospital USM and could be used among other postpartum mothers with similar cultural background. In this study, the respondents had good knowledge and positive attitude towards breastfeeding. In future study, the knowledge and attitude scores may be analysed to determine their influences on exclusive breastfeeding initiation and maintenance, by including other possible factors such as working status, family income and breast milk expression practice.

REFERENCES

1: World Health Organization. Global Strategy for Infant and Young Child Feeding. 2003; Retrieved 02/15/2015 from http:// www.who.int/nutrition/ publications/ gs_infant_ feeding_text_eng.pdf.

2: National Coordinating Committee on Food and Nutrition. Malaysian Dietary Guidelines. Kuala Lumpur: Ministry of Health; 2010: 169-172.

3: Zaharah S, Lisa HA, Liamputtong P. Evolution, early experience and human development: From research to practice and policy; Infant Feeding Practices: Rates, Risks of Not Breastfeeding, and Factors Influencing Breastfeeding. Oxford University Press; 2012: 277-298.

4: Ministry of Health Malaysia. Annual Report 2011. Kuala Lumpur: Ministry of Health Malaysia; 2011: 115-116.

5: Fatimah S, Siti SHN, Tahir A, Hussain IMI, Ahmad FY. Breastfeeding in Malaysia: Results of the Third National Health and Morbidity Survey (NHMS III) 2006. Malaysian J Nutrition. 2010; 16:195-206.

6: Tan AE, Choong WK, Leong PY, Ng WM, Yong SL. Knowledge, attitudes and sources of information on breastfeeding among pregnant mothers. Med Health. 2008; 3:30-7.

7: Tan K. Knowledge, attitude and practice on breastfeeding in Klang, Malaysia. Int Med J. 2009; 8:17-21.

8: Mohammed ES, Ghazawy ER, Hassan EE. Knowledge, attitude, and practices of breastfeeding and weaning among mothers of children up to 2 years old in a rural area in el-minia governorate, Egypt. J Fam Med Prim Care; 2014: 3,136.

9: McDonald JA, Burnett N, Coronado VG, Johnson RL. In Reproductive Health Epidemiology Series. Vol 4. U.S. Department of Health and Human Services, Atlanta, Georgia, U.S.A; 2003: 1-69.

10: Chambers JA, Alder E, Hoddinott P, McInnes R. A systematic review of measures assessing mothers' knowledge, attitudes, confidence and satisfaction towards breastfeeding. Breastfeeding Review. 2007; 15:17-23.

11: Testa MA, Simonson DC. Assessment of quality -of-life outcomes. New Engl J Med. 1996; 334:835-40.

12: Fletcher RH, Fletcher SW, Wagner EH. Clinical epidemiology: the essentials. 3rd ed. Maryland: Williams & Wilkins; 1996.

13: Jackson CJ, Furnham A. Designing and Analysing Questionaires and Surveys: A Manual for Health Professionals and Administrators. Wiley; 2000.

14: Williams B, Brown T, Onsman. Exploratory factor analysis: A five-step guide for novices. Australasian J Paramed; 2012: 8, 1

15: Alina T, Zaharah S. Reliability and validity of a Malay-version questionnaire assessing knowledge of breastfeeding. Malaysian J Med Sci. 2010; 17:32-9.

16: Davis LL. Instrument review: Getting the most from a panel of experts. Applied Nursing Res. 1992; 5:194-7.

17: Pelet JE, Khan J, Papadopoulou P. Towards a scale for perceptions of mobile interaction: Establishing content and face validity. Procedia-Social Behavioural Sci. 2012.

18: Compton MT, Hankerson-Dyson D, Broussard B. Development, item analysis and initial reliability and validity of a multiple-choice knowledge of mental illnesses test for a lay samples. Psychiatry Research. 2011; 189:141-8.

19: Legg SM. Handbook on Testing and Grading. Gainesville, Florida; 1991.

20: Hinton PR, Brownlow C, Mcmurray I, Cozens B. SPSS Explained. Routledge, New York. 2004

21: Kline, Rex B. Principles and Practice of Structural Equation Modeling. New York: Guilford Press. 2011

22: Hair Jr JF, Black WC, Babin BJ, Anderson RE, Tatham RL. Multivariate data analysis. 7th ed. Pearson-Prentice Hall, Upper Saddle River, NJ; 2009.

23: Bahia K, Nantel J. DA reliable and valid measurement scale for the perceived service quality of banks. Int J Bank Marketing. 2000; 18:84-91

24: Muilenburg LY, Berge ZL. Student barrier to online learning: A factor analystic study. Dist Edu. 2005; 26:29-4.

25: Chen CF, Tsai DC. How destination image and evaluative factors affect behavioural intentions? Tourism Management. 2007; 1115-22.

26: Portney L, Watkins M. Statistical measures of validity. Foundations of clinical research: Applications to practice. 3rd ed. Upper Saddle River, NJ, Pearson/Prentice Hall**;** 2009: 644-653.

27: Alina T, Manan WA, Isa B. Factors predicting early discontinuation of exclusive breastfeeding among women in Kelantan, Malaysia. Health Environ J. 2013; 4:42-54.

28: Noor Hafizan MS, Zainab T, Rosnah S. Sociodemographic factors associated with duration of exclusive breastfeeding practice among mothers in east Malaysia. J Nurs Health Sci. 2014; 3:52-6

29: Kaliyaperumal K. Guideline for conducting a knowledge, attitude and practice (KAP) study. AECS Illumination. 2004; 4:7-9.

30: Muijtjens A, J. van Mameren R, Hoogenboom J, C van der Vleuten. The effect of don't know option

on test scores: number-right and formula scoring compared. Med Edu. 1999; 33:267-75.

31: MacLeod A, Kumas-Tan Z, Beagan B, Loppie C, Frank B. Measures of cultural competence: examining hidden assumptions. Acad Med. 2007; 82:548-57.

32: Downing SM. Face validity of assessments: faith-based interpretations or evidence-based science? Med Edu. 2006; 40:7-8.

33: Brown TA. Confirmatory factor analysis for applied researched. New York: The Guilford Press; 2006.

34: Garson G. Factor Analysis, from Statnotes: Topics in Multivariate Analysis, 2011. Retrieved 02/15/2015 from http://www2. chass. ncsu. edu/ garson/pa765/statnote. htm

Items of knowledge domain

	Advantages to baby
K_Q1	Penyusuan susu ibu boleh mengurangkan kadar risiko bagi bayi untuk mendapat jangkitan paru-paru *Breastfeeding reduces the risk of lung infection among babies*
K_Q7*	Penyusuan susu ibu menyebabkan bayi mudah mengalami cirit-birit *Baby who received breastfeeding is more prone to get diarrhoea*
K_Q12	Penyusuan susu ibu dapat meningkatkan kecerdasan otak bayi *Breastfeeding increases the baby's intelligence*
K_Q16*	Susu formula lebih melindungi bayi dari alahan jika dibandingkan dengan susu ibu *Formula milk provides baby with more protection from allergy compared to breast milk*
K_Q19	Penyusuan susu ibu mengurangkan kejadian penderaan *Breastfeeding helps to reduce the incidence of child abuse*
K_Q35*	Penyusuan susu ibu menyebabkan pembentukan gigi bayi tidak sempurna *Breastfeeding causes poor development of baby's teeth*
	Advantages to mother
K_Q4	Memberi susu ibu dengan kerap dapat mengelakkan bengkak payudara *Frequent breastfeeding may prevent breast engorgement*
K_Q8	Penyusuan susu ibu secara ekslusif boleh menjarakkan kehamilan *Exclusive breastfeeding is beneficial in spacing birth*
K_Q13	Penyusuan susu ibu boleh membantu pengecutan rahim ibu *Breastfeeding helps to stimulate uterine contraction*
K_Q10	Ibu yang menyusu lebih cepat kembali kepada berat badan asal sebelum mengandung *Mothers who practised breastfeeding may achieve pre-pregnancy weight faster*
K_Q15*	Ibu yang menyusu berisiko untuk mendapat kanser payudara *Mother who practised breastfeeding has risk of getting breast cancer*
K_Q25*	Penyusuan susu ibu menggalakkan proses pereputan tulang *Breastfeeding may not protect against osteoporosis*
	Colostrum
K_Q2*	Kolostrum boleh menyebabkan bayi susah membuang air besar *Colostrum causes constipation among babies*
K_Q9	Kolostrum ialah susu awal ibu yang bersifat pekat, melekit dan berwarna jernih kekuningan *Colostrum is the mother's early milk, which is thick, sticky, and yellowish in colour*
K_Q14*	Kolostrum sukar dihadam dan patut dibuang *Colostrum is difficult to digest and needs to be discarded*
K_Q20*	Kolostrum tidak boleh melindungi bayi dari jaundis *Colostrum is not able to protect babies from jaundice*
	Effective feeding
K_Q5	Bayi tidur dengan lena jika mendapat susu ibu yang mencukupi *Babies sleep well after they receive adequate breastfeeding*
K_Q17	Berat badan bayi akan meningkat secara sihat sekiranya mendapat penyusuan yang sempurna *Babies will gain weight if they receive effective feeding*
K_Q18	Posisi penyusuan yang betul membantu keberkesanan penyusuan bayi *Correct positioning helps to achieve effective breastfeeding*
	Breast milk expression
K_Q6	Pemerahan susu ibu boleh dilakukan setiap 3 jam jika bayi tidak bersama ibu *Breast milk expression may be done every 3 hours if baby away from mother*
K_Q11*	Susu perahan boleh dipanaskan di atas api *Expressed breast milk may be warmed on a fire*
K_Q21*	Perahan susu hanya perlu pada sebelah payudara sahaja *It is necessary to express breast milk from one side of the breast*
K_Q23	Susu perahan boleh disimpan sehingga 3 ke 5 hari dalam peti sejuk bahagian bawah *Expressed breast milk may be stored for 3 to 5 days in a lower part of a refrigerator*
K_Q27*	Perahan susu ibu yang telah digunakan boleh disimpan semula *The leftover expressed breast milk that has been used may be stored again*
K_Q31	Susu perahan boleh disimpan sehingga 3 bulan di bahagian sejuk beku dalam peti sejuk 2 pintu *Expressed breast milk may be stored for 3 months in a freezer of a 2-door refrigerator*
K_Q33*	Susu perahan boleh dipanaskan dalam ketuhar gelombang mikro *Expressed breast milk may be warmed in a microwave*
K_Q39*	Susu perahan boleh dicampur dengan susu perahan sebelumnya *Expressed breast milk may be mixed with the previous expressed milk*
	Duration of feeding
K_Q22	Penyusuan susu ibu perlu diteruskan sehingga 2 tahun walaupun bayi telah mendapat makanan pelengkap *Breastfeeding should be continued up to 2 years even though the baby has received complementary food*
K_Q29	Penyusuan susu ibu perlu diberi mengikut kehendak bayi *Breastfeeding should be given on demand*
K_Q30	Bayi hendaklah dibenarkan menyusu sekurang-kurangnya 10-20 minit pada setiap kali penyusuan *Baby should be allowed to breastfeed for at least 10–20 minutes for each feeding*
K_Q36	Penyusuan susu ibu patut dimulakan dalam tempoh 30 minit selepas bayi dilahirkan *Breastfeeding should be initiated within 30 minutes after delivery*
	Complementary feeding
K_Q26*	Ibu boleh mencampurkan penyusuan susu ibu dan susu formula apabila bayi mula mengambil makanan pelengkap *Mothers may mix breastfeeding and formula feeding once baby starts taking complementary food*
K_Q32	Makanan pelengkap hendaklah dimulakan apabila bayi berumur 6 bulan *Complementary feeding should be introduced at 6 months of age*
	Problem with breastfeeding
K_Q3*	Ibu yang mempunyai puting susu tenggelam tidak boleh menyusukan bayi mereka *Mothers with inverted nipples cannot breastfeed their babies*
K_Q24*	Penghasilan susu ibu dipengaruhi oleh saiz payudara *Breast milk production is influenced by breast size*
K_Q28*	Penyusuan susu ibu perlu dihentikan jika ibu mempunyai puting susu merekah *Breastfeeding must be discontinued if mother has cracked nipple*
K_Q37*	Penyusuan susu ibu perlu dihentikan jika bayi mengalami jaundis *Breastfeeding must be discontinued if baby has jaundice*
K_Q47*	Penyusuan susu ibu perlu dihentikan jika ibu mengalami bengkak susu *Breastfeeding must be discontinued if mother has breast engorgement*
	Breast engorgement
K_Q34	Bengkak payudara boleh diatasi dengan demahan sejuk *Breast engorgement may be reduced with cold packs*
K_Q40	Daun kubis boleh membantu mengurangkan bengkak payudara *The use of cabbage may help to reduce breast engorgement*
	Practical aspect of breastfeeding
K_Q38*	*Oral trush* (keputihan pada lidah) kerap berlaku pada bayi yang menyusu susu ibu *Oral thrush frequently happens to babies who breastfeed*
K_Q41	Penyusuan secara ekslusif perlu dilakukan sehingga bayi berumur 6 bulan *Exclusive breastfeeding must be practiced until the infant is 6 months old*
K_Q42	Kaedah urutan pada payudara dapat mengurangkan bengkak payudara *Massage may reduce breast engorgement*
K_Q43*	Pemberian air masak adalah digalakkan setiap kali selepas penyusuan susu ibu *Giving water to baby is encouraged after every breastfeeding*
K_Q44*	Bayi sendawa selepas menyusu menunjukkan bayi kenyang *Belching after feeding shows that the baby is full*
K_Q45	Bayi yang menyusu dengan cukup akan kencing dengan lebih kerap *Babies who get enough feeding will pass urine more frequently*
K_Q46*	Bayi juga boleh diberi susu formula sepanjang penyusuan semasa 6 bulan pertama *Babies may also be given formula milk in the first 6 months*

Items of attitude domain

	Cognitive
A_Q1	Penyusuan susu ibu secara ekslusif adalah lebih mudah daripada memberi susu formula kepada bayi *Exclusive breastfeeding is easier than formula feeding*
A_Q3*	Susu formula akan menjadikan bayi sihat *Formula milk will make the infant healthy*
A_Q6	Penyusuan susu ibu secara ekslusif mencegah masalah berat badan berlebihan kepada ibu selepas bersalin *Exclusive breastfeeding prevent mothers of getting overweight after delivery*
A_Q7*	Penyusuan susu ibu secara ekslusif menyebabkan payudara menjadi kendur *Exclusive breastfeeding causes breast sagging*
A_Q8	Penyusuan susu ibu secara ekslusif adalah pilihan yang terbaik bagi ibu-ibu yang bekerja *Exclusive breastfeeding is a better choice for working mothers*
A_Q11*	Khasiat dalam susu ibu boleh diperolehi daripada susu formula *Breast milk contains less nutrients*
A_Q19	Penyusuan susu ibu secara ekslusif dapat menjimatkan perbelanjaan keluarga *Exclusive breastfeeding can save on family expenses*
A_Q18*	Susu formula mencegah masalah berat badan berlebihan kepada bayi apabila dewasa kelak *Formula milk prevent infants of getting overweight in adulthood*
	Affect
A_Q2	Penyusuan susu ibu secara ekslusif tidak mendatangkan kesan negatif kepada hubungan suami isteri *Exclusive breastfeeding does not cause negative effects on the relationship of husband and wife*
A_Q4*	Penyusuan susu ibu secara ekslusif memakan masa *Exclusive breastfeeding takes time*
A_Q10*	Penyusuan susu ibu secara ekslusif akan menyebabkan hubungan ayah dan bayi menjadi renggang *Exclusive breastfeeding will cause the relationship between father and baby to be estranged*
A_Q12*	Penyusuan susu ibu secara ekslusif adalah sesuatu yang memalukan ibu *Exclusive breastfeeding embarrassed mothers*
A_Q13*	Penyusuan susu ibu secara ekslusif adalah sesuatu yang ketinggalan zaman *Exclusive breastfeeding is outdated*
A_Q14*	Ibu yang memberi susu formula menunjukkan status sosial yang lebih tinggi *Formula-feeding mothers showed higher socialstatus*
A_Q15*	Penyusuan susu ibu secara ekslusif menyebabkan ibu berasa tertekan *Exclusive breastfeeding cause the mother to feel depressed*
A_Q16	Penyusuan susu ibu secara ekslusif adalah tanggungjawab seorang ibu *Exclusive breastfeeding is the responsibility of a mother*
	Behavioural
A_Q5*	Penyusuan susu ibu secara ekslusif menyebabkan ibu mempunyai masalah untuk menyusu di tempat awam *Motherswho breastfeed exclusively has problem in breastfeeding in public*
A_Q9	Ibu perlu berjumpa dengan doktor atau jururawat jika mempunyai masalah penyusuan *Mothers need to see doctors or nurses if having any breastfeeding difficulties*
A_Q17	Ibu yang menyusukan bayi secara ekslusif tidak mempunyai masalah dalam menguruskan keluarga *Mothers who breastfeed exclusively has no problem in managing the family*
A_Q20*	Penyusuan susu ibu secara ekslusif menyebabkan tidur ibu terganggu *Exclusive breastfeeding causes sleep disturbance for mothers*
A_Q21*	Penyusuan susu ibu secara ekslusif mengganggu tugas harian ibu *Exclusive breastfeeding disturbs mothers' daily activities*
A_Q22*	Penyusuan susu ibu secara ekslusif memenatkan ibu *Exclusive breastfeeding causes tiredness*
A_Q23	Penyusuan susu ibu secara ekslusif memudahkan ibu untuk melakukan aktiviti luar *Exclusive breastfeeding made easy for mother to do outdoor activities*