KNOWLEDGE AND ATTITUDE OF MATERNAL DIET AND ALLERGY AMONG BREASTFEEDING PEER COUNSELLORS IN PAHANG

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ABSTRACT

The incidence of allergic diseases among children appears to have rapid increased over the last few decades. Surprisingly, the allergic diseases also occurs among exclusively breastfed infants despite the protective effect of the breastmilk is well known. There is a great interest in identifying the prevention of allergy diseases among breastfed infants. The environmental factors including maternal diet was found to influence allergic development among breastfed infants. Breastfeeding Peer Counsellors (BPC) plays an important role among breastfeeding mothers to promote breastfeeding and healthy maternal diet towards allergy prevention among breastfed infants as early as during pregnancy and breastfeeding. This study aimed to identify the level of knowledge and attitude before and after intervention regarding maternal diet and allergy among BPC in Pahang. Thus, a cross-sectional survey was conducted using validated self-administered knowledge and attitude questionnaire to 72 BPC (20-60 years) in eleven district of Pahang.

The data were collected using convenient sampling method. The research results showed that BPC had good level of knowledge on maternal diet and allergy 37 (51.4%). Most of the BPC also had positive attitude towards maternal diet and allergy 32 (44.4%). However, there were no significant association between socio-demographic factors and knowledge and attitude regarding maternal diet and allergy with p-value >0.001. The result also shows a significant moderate-good correlation between knowledge and attitude (r= 0.668) and significant difference (p-value =0.001) between knowledge and attitude among BPC. The good knowledge and attitude of BPC indicated that the BPC can be one of the medium to promote good maternal diet towards allergy prevention. These findings also provides some implications that the enhancement of knowledge and attitude on maternal diet and allergy among BPC can be done in order to prevent allergy among breastfed infants.

INTRODUCTION

Breast milk is the optimal natural source of nutrients that provide many health benefits to the infants. Exclusive breastfeeding was recommended as part of the nutritional benefits for both mother and infant. One of the benefits of breastfeeding is to protect the breastfed infants from allergies such as asthma and eczema besides providing many essential nutrients. Despite the increase in breastfeeding practice had been addressed, the prevalence of allergy among breastfed infants is on the rise. The current evidence found that there are many allergies incidence among exclusively breastfed infants (Rajani *et al.*, 2020). This driving force on the demand of the explanation behind the allergy prevalent among breastfed infant. The prevention of allergy become the main purpose in order to reduce the health burden among breastfed infants.

One of the factors that found to contribute to the allergy among breastfed infants is the maternal dietary intake. The birth cohort study of 970 children found that breastfed children were associated with increased risk of food sensitization with also depend on the genetic variants (Martin-Munoz *et al.*, 2016). Food protein-induced allergic proctocolitis occurs nearly 60% of cases among exclusively breastfed infants with more than 20% of breastfed infant had dermatitis (Rajani *et al.*, 2020). Maternal dietary intake that consist of allergen can affect the infant's immune system which lead to the allergic reaction among breastfed infants. Improper maternal dietary intake is one of the important determinants that contribute to the allergic prevalent among exclusively breastfed infants. Thus, the risk of allergy among exclusively breastfed infants may be reduced via modulation of maternal diet.

In related to breastfeeding practice, breastfeeding peer counsellors (BPC) had been established to support the mothers in many ways with regards to the breastfeeding. Chapman *et al.* (2010) stated that initiatives of having BPC are effective to promote

breastfeeding and related maternal-child health programs. BPC can give positive impact to the mothers to share and support the mothers with the knowledge regarding the allergy prevention besides promoting breastfeeding. This can be one of the effective methods in the intervention among BPC that can be done to prevent the allergy among infants by educating the mothers. Having good knowledge and attitude among BPC can help the mothers to reduce the allergy prevalence among exclusively breastfed infants. Therefore, the aimed of this research is to identify the level of knowledge among BPC regarding the maternal diet and allergy.

MATERIALS AND METHODS

This research study is a cross-sectional study. This study was conducted among BPC in Pahang from eleven districts. A self-administered questionnaire was given before and after the intervention to the participants after obtaining their informed consents. A total of 80 BPC participated in this study. Most of the participants had completed the survey (n = 72, 90% response rate) for final analysis. Then, the collected data was analyzed using SPSS version 12.0 software. The participants were given a token as appreciation for participating in this study.

Study Area

Eleven district of Pahang were involved in this study. This includes Kuantan, Temerloh, Bentong, Bera, Cameron Highlands, Jerantut, Kuala Lipis, Maran, Pekan, Raub and Rompin.

Study Population

The subject selected are from Breastfeeding Peer Counsellors (BPC) in Pahang that named as Kumpulan Sokongan Penyusuan Susu Ibu Pahang (KUSSIP) that come from all districts in Pahang.

Study Design

Throughout this study, cross-sectional study design to assess the association between elements of knowledge and attitude in pre- and post-intervention among BPC.

Sampling Method

Convenience sampling method was used in this study as participants were the population members who were conveniently available to participate. The participants were

chosen based on the basis of accessibility of Pahang BPC population that meet the inclusion criteria. The inclusion criteria for the population were among BPC group in Pahang and aged 20 to 60 years old.

Sample Size Calculation

In this study, Single Proportion Formula was used as there no comparison is to be made. (Bronner, Barber, Vogelhut and Resnik, 2001)

$Z \frac{\alpha}{2}$ = 1.96 (for 95% CI)
Δ = precision = 0.05
p = proportion in population

$$n = \left[\frac{1.96}{0.05}\right]^2 0.95(1 - 0.95)$$
$$= 72.99$$
$$\sim 73$$

Additional of 10% respondents are included in the study unavailability and refusal to participate.

10% of respondent = 73 + 10%
$$= 73 + 7.3$$
$$= 80.3$$
$$\sim 80$$

Pilot Study

A pilot study, validity and reliability test of the questionnaire were done to ensure the questions is suitable, reliable and valid to the participants. The pilot study was conducted on 9 participants among BPC. The results from the pilot study shown that all the participants understood all the questions and the questions are reliable and valid to be used by the participants after the reliable and validity assessment had been done.

Instruments

In this study, questionnaire was used as an instrument. The questionnaire consists of three parts including the socio-demographic data, knowledge on maternal diet and allergy, and attitude on maternal diet and allergy.

Data Collection

In December 2018, the study was started by distributing the survey questionnaires to about 80 BPC in Pahang. However, the data collected was only from 72 participants due to some participants did not completed the survey. The data then had been analyzed using SPSS statistics version 12.0.

Outcome Measure

The scoring method was used to categorize the knowledge and attitude based on the recommendation of Technical Working Group on Research of Ministry of Health for nutrition knowledge and attitude (Lim *et al.*, 2018). The categorized of knowledge were 0-50% for poor, 51-74% for moderate and >75% for good knowledge while for attitude were 0-50% for negative, 51-74% for moderate and >75% for positive attitude.

Statistical Analysis

The data were analyzed using SPSS Statistical Package Social Science (SPSS 12.0). Descriptive statistic was used in this data analysis. The independent t-test and ANOVA were used to investigate the relationship between the socio-demographic data and the scores of knowledge and attitude. For the categories where the normality assumptions were met, the Pearson Correlation test was used. Correlation test was used in order to study the relationship between the knowledge and attitude scores. Confidence level 95% and 0.05 was set for alpha.

Ethical Consideration

This study was approved by KAHS Postgraduate and Research Committee (KPGRC), and IIUM Ethics Committee (IREC). The informed consent were given to the participants that participate voluntarily and all the information is kept confidential.

RESULTS

The socio-demographic data of the participants were analyzed and evaluated by using descriptive statistics. The participants were categorized according to; age, ethnicity, marital status, education level, occupations and monthly household income.

Socio-Demographic Data

Table 3.1 shows the number of participants according to age, ethnicity, marital status, education level and occupations. Most of the respondents were between 30 to 39 years old (n=34, 47.2%). The mean age of the respondents in this study was 41 years old (range: 32-49). The respondents in this study were all female with majority of the participants were married (95.8%) and Malay (98.6%) except for one respondent was Chinese. Nearly half of the participants in this study had either STPM or Diploma 32 respondent with 44.4% as their previous educations, followed by SPM 23 (31.9%) and degree 13 (18.1%). The least education level was Postgraduate with 4 respondents that account for 5.6%. The respondents in this research mostly from healthcare sectors with 29 (40.3%) respondents and more than half of the women in this study had high range of monthly income more than 3500 MYR with frequency of 43 and percentage of 59.7%. Only 2 respondent reported to have income below than 1999 MYR with 2.8%.

Table 3.1 Socio-demographic Data of Respondents

Characteristics	Total (n=72)	Percentage	Mean± SD
	N	%	
Age			
≤29	5	6.9	
30-39	34	47.2	40.611±8.677
≥40	33	45.8	
Ethnicity			
Malay	71	98.6	
Chinese	1	1.4	
Marital status			
Single	3	4.2	
Married	69	95.8	
Education level			
SPM	23	31.9	
STPM/Diploma	32	44.4	
Degree	13	18.1	
Post Graduate	4	5.6	
Occupations			
Housewife	5	6.9	
Business	4	5.6	
Healthcare	29	40.3	
Clerk	15	20.8	
Others	19	26.4	
Monthly income (MYR)[a]			
≤1999	2	2.8	
2000-3499	27	37.5	4537.28± 2244.50
≥3500	43	59.7	

[a]Classification based on Malaysia Economic Planning Unit 2015

Scores of Knowledge and Attitude

Based on Table 3.2, shows the highest score of knowledge and attitude on maternal diet and allergy 51.4% good level of knowledge and 44.4% of positive attitude. While followed by second higher percentage, moderate knowledge and attitude which was 34.7% and 40.3% respectively. In addition, poor level of knowledge was recorded 13.9% and 15.3% of negative attitude in the pre-intervention.

Table 3.2 Category of Knowledge and Attitude Scores on Maternal Diet and Allergy

Category	Frequency (n)	Percentage (%)	Mean ± SD
Knowledge level			
Poor	10	13.9	
Moderate	25	34.7	13.93 ±3.77
Good	37	51.4	
Attitude level			
Negative	11	15.3	
Moderate	29	40.3	13.60 ±3.21
Positive	32	44.4	

Knowledge and Attitude on Maternal Diet and Allergy

Table 3.3 demonstrated the distribution of knowledge on maternal diet and allergy among BPC in Pahang for pre-intervention. For knowledge on maternal diet, knowledge on benefits of fruits and vegetable intake to the mothers shows all correct answer 72 (100%) from participants. A few top knowledge scores on maternal diet were on maternal diet can influence the nutrient content in the breast milk 67(93%), definition of healthy and balanced diet 60 (83.3%), fermented food give benefits to the mothers 57 (79.2%), supplements intake for mother need advice from healthcare provider 56 (77.8%), galactogogues or milk enhancement can be taken by mother during breastfeeding 49 (68%) and food that contains vitamin A and C can boost the immunity 44 (61.1%). For knowledge on allergy, the top three answer were on risk of food allergy due to uncertainty food 60 (83.3%), risk of allergy among children 58 (80.6%) and definition of anaphylaxis due to food allergy 57 (79.2%).

The distributions on attitude on maternal diet and allergy were demonstrates in table 3.4. Based on table 3.4, the top scores on attitude includes were on the importance of healthy and balanced diet for mothers, maternal diet influenced the nutrient in the breast milk, understand that mothers should take good nutrients as recommended and know the importance of eating according to the right meal time with result 69 (95.8%), 68 (94.4%), and 66 (91.7%) respectively. The attitude towards the recommended of fruits and vegetables intake 15 (20.8%) shows the least results.

Table 3.3 Distribution of Knowledge on Maternal Diet and Allergy

Statement	Correct Frequency		Wrong Frequency		Not sure Frequency	
Knowledge on maternal diet	N	(%)	N	(%)	N	(%)
1. Maternal diet can influence the nutrient content in the breast milk	67	93.0	1	1.4	4	5.6
2. Definition of healthy and balanced diet	60	83.3	10	13.9	2	2.8
3. Benefits of fruits and vegetables intake to the mothers	72	100	0	0	0	0
4. Daily recommended intake of vegetables	36	50.0	36	50	0	0
5. Daily recommended intake of fruits	31	43.1	41	56.9	0	0
6. Food that contains vitamin C helps to prevent allergy	30	41.7	36	50.0	6	8.3
7. Food that contains vitamin A and C can boost the immunity	44	61.1	22	30.6	6	8.3
8. Fermented food give benefits to the mothers	57	79.2	6	8.3	9	12.5
9. Supplements intake for mother need advice from healthcare provider	56	77.8	14	19.4	2	2.8
10. Galactogogues or milk enhancement can be taken by mother during breastfeeding	49	68.0	12	16.7	11	15.3
Knowledge on allergy						
11. Protein is the main cause of food allergy	47	65.3	13	18.0	12	16.7
12. Definition of anaphylaxis due to food allergy	57	79.2	5	6.9	10	13.9
13. Risk of allergy among children	58	80.6	7	9.7	7	9.7
14. The differences between food allergy and food intolerance	51	70.8	5	7.0	16	22.2
15. Maternal diet can influence the development of food allergy among breastfed babies.	48	66.7	12	16.7	12	16.7
16. Food that cause allergy among children such as peanuts, soy, sesame and seafood.	53	73.6	10	13.9	9	12.5
17. Fermentation process can reduce the allergen.	28	38.9	21	29.2	23	31.9
18. Risk of food allergy due to uncertainty food.	60	83.3	3	4.2	9	12.5
19. Food contamination can cause allergy.	51	70.8	8	11.1	13	18.1
20. Antioxidants rich food helps to prevent allergy.	49	68.1	7	9.7	16	22.2

Table 3.4 Distribution of Attitude on Maternal Diet and Allergy

Statement	Response category					
	Correct Frequency		Wrong Frequency		Neutral Frequency	
	N	(%)	N	(%)	N	(%)
Attitude on maternal diet						
1. I know the importance of healthy and balanced diet for mothers	69	95.8	0	0	3	4.2
2. I know that maternal diet influenced the nutrient in the breast milk.	68	94.4	1	1.4	3	4.2
3. I understand that mothers should take good nutrients as recommended.	70	97.2	0	0	2	2.8
4. I know that mothers should take food according to healthy plate.	64	88.9	6	8.3	2	2.8
5. I know the recommended daily intake for fruits and vegetables.	15	20.8	47	65.3	10	13.9
6. I know the recommended servings intake of fish per week.	20	27.8	41	56.9	11	15.3
7. I know the importance of calcium intake for mothers and babies.	54	75	13	18.1	5	6.9
8. I believed that supplements intake can be taken without advices from healthcare providers.	56	77.8	15	20.8	1	1.4
9. I believed that supplements intake give adequate nutrients for mothers without healthy diet practice.	60	83.3	7	9.7	5	7
10. I know the importance of eating according to the right meal time.	66	91.7	4	5.6	2	2.8
Attitude on allergy						
11. I am aware of foods that have risk of allergy to my baby.	65	90.3	0	0	7	9.7
12. I know I need to avoid food that cause allergy after getting advices from healthcare providers.	63	87.5	3	4.2	6	8.3
13. I know I need to read the food label to avoid food allergy.	45	62.5	10	13.9	17	23.6
14. I believed that maternal diet during breastfeeding influenced the development of allergy in babies.	48	67	11	15	13	18
15. I believed that avoidance of milk enhancer intake such as soy can reduce the risk of allergy among breastfed babies.	53	73.6	7	9.7	12	16.7
16. I know the intake of fruits and vegetables do not cause the allergy.	27	37.5	9	12.5	36	50
17. I know I can use the mixture of baking powder, vinegar and water to replace the use of eggs in baking.	22	30.5	20	27.8	30	41.7
18. I know that peanut oil do not cause the allergy if I had allergy to peanut.	19	26.4	31	43.1	22	30.5

19. I know that mothers who practice the intake of food that contains prebiotics can reduce the risk of allergy to the breastfed babies.	37	51.4	8	11.1	27	37.5
20. I know the risk of food contamination when eating outside.	61	84.7	0	0	11	15.3

Association between Socio-demographic factors and Knowledge and Attitude

Table 3.5 illustrates that all the socio-demographic data were not significant with knowledge regarding the maternal diet and allergy in the pre intervention with p-value >0.001. This includes age, ethnicity, marital status, education level, occupation and monthly household income with p-value of 0.938, 0.296, 0.457, 0.915, 0.149 and 0.164 respectively.

Table 3.5 Association between Socio-demographic Characteristics with Knowledge Scores

Variable	Mean ± SD	Median	p-value
Age group			
≤29	4.20 ± 1.92	14.00	
30-39	13.76 ± 4.06	15.00	0.938
≥40	14.06 ± 3.73	15.00	
Ethnicity			
Malay	13.99 ± 3.76	15.00	0.296
Chinese			
Marital status			
Single	12.33 ±2.52	12.00	0.457
Married	14.0±3.81	15.00	
Education level			
SPM	13.83 ± 4.31	15.00	
STPM/Diploma	13.91 ± 3.77	14.00	0.915
Degree	13.77 ± 3.35	14.00	
Post Graduate	15.25 ± 2.22	16.00	
Occupations			
Housewife	14.0 ±6.96	16.00	
Business	11.00 ±3.83	12.00	
Healthcare	14.34 ±2.33	15.00	0.149
Clerk	12.47 ± 4.88	13.00	
Others	15.05 ±3.22	16.00	
Monthly household income			
≤1999	9.00 ± 8.49	9.00	
2000-3499	13.89 ± 3.65	15.00	0.164
≥3500	14.19 ± 3.57	15.00	

Association between Socio-demographic Characteristics with Attitude Scores

Table 3.6 below indicates that no significant association between all socio-demographic variables with attitude on maternal diet and allergy scores with 0.419, 0.263, 0.383, 0.400, 0.407 and 0.406 respectively.

Table 3.6 Association between Socio-demographic Characteristics with Attitude Scores.

Variable	Mean ± SD	Median	p-value
Age group			
≤29	11.8 ± 5.54	13.00	
30-39	13.62 ± 2.61	14.00	0.419
≥40	13.85 ± 3.39	15.00	
Ethnicity			
Malay	13.65 ± 3.21	14.00	0.263
Chinese			
Marital status			
Single	12.00 ± 1.73	13.00	0.383
Married	13.67 ± 3.25	14.00	
Education level			
SPM	13.35 ± 3.08	14.00	
STPM/Diploma	13.41 ± 3.27	14.00	0.400
Degree	13.69 ± 3.63	15.00	
Post Graduate	16.25 ± 0.96	16.50	
Occupations			
Housewife	13.0 ± 4.85	14.00	
Business	14.00 ± 1.63	14.00	
Healthcare	13.83 ± 3.21	15.00	0.407
Clerk	12.27 ± 3.16	13.00	
Others	14.37 ± 3.04	15.00	
Monthly household income			
≤1999	11.00 ± 8.49	11.00	
2000-3499	13.33 ± 3.33	14.00	0.406
≥3500	13.88 ± 2.90	14.00	

Relationship between Knowledge and Attitude regarding Maternal Diet and Allergy

Figure 3.1 illustrates the scatter plot of the association between knowledge scores and attitude scores on maternal diet and allergy. The correlation coefficient, r value of 0.668 in Table 3.12 indicates the moderate-good correlation between this associations. Similar to association with attitude scores, the positive r value indicates that the correlation is positive and significant of p-value of 0.001.

Table 3.12 Correlation between Knowledge and Attitude Score on Maternal Diet and Allergy

Items		Correlation coefficient, r	*p*-value	Interpretation
Knowledge-Scores	Attitude	0.668	0.001	Positive moderate correlation

DISCUSSION

From the findings, it shows that all the participants were all women with majority of Malay (98.6%), married (95.8%) and aged between 30 to 39 years old (47.2%) from the total percent of the participants. This is because majority of the BPC members were women with a few members were men in Pahang. Most of the participants also had tertiary education and above (68.1%), work as healthcare (40.3%) and 59.7% of the respondents had higher household income.

The present study found that majority of the BPC (51.4%) have good knowledge on maternal diet and allergy. This is also supported by Lim *et al.* (2018) that more than half (63.6%) of the mothers had good knowledge on maternal nutrition. A study done by Ikhsan *et al.* (2016) in Kuantan, Pahang also agreed that more than half (52.0%) of mothers have good nutritional knowledge. Similar from previous study by Fasola, Abosede, and Fasola (2018) in Somolu reported that most of the women had good overall knowledge 61.89% on nutrition. In contrast, Tenaw *et al.* (2018) showed that only 27% of the mothers had good maternal diet knowledge which lower than the current findings. Another study done in Klang Valley, Malaysia reported that majority of the pregnant women had moderate level of nutritional knowledge as compare to the current study (Ikhsan *et al.*, 2016). In terms of knowledge on allergy, Gomaa *et al.* (2020) stated that most of the mothers (58%) had poor knowledge on food allergy while only 24% of mothers had good knowledge in Taif City, Saudi Arabia that is lower than the current findings. The current results of this study indicate that high level of knowledge on maternal diet and allergy might be due to high educational level of the participants as all (100%) of the BPC had at least secondary level of education (SPM) and above. As stated by Mugyia *et al.* (2016) the high level of knowledge might be due to high level of education as most of the respondents (77.0%) had at least secondary level of education. Thus, this might be the factor that contribute to the high percentage of good level of knowledge among participants in this study.

In addition, all of the participants (100%) know the benefits of fruits and vegetable intake. However, nearly half of the participants did not know the daily recommended intake of vegetables (50%) and fruits (43.1%). It is recommended to take two servings of fruits and three servings of vegetables daily (Malaysian Dietary Guidelines, 2013). This is because it is important for the mothers to consume adequate cooked vegetable in order to reduce the

allergy incidence among infants. As stated by Baiz *et al*. (2019), there is an association between cooked green vegetables consumption before and during pregnancy and childhood asthma and allergic rhinitis. The intake of fibre can give positive effect on modulators of the individual's gut microbiome towards allergy prevention (Maher *et al*., 2020). This is also supported by Ferrante *et al*. (2020) that maternal dietary intake rich in vegetables during pregnancy had reduced the risk of childhood asthma among infants. Almost all of the participants know that maternal diet that can influence the nutrient content in the breast milk give 67(93%). As mentioned by Basir *et al*. (2019) that nutrients composition in the breast milk were influenced by the maternal dietary intake. Thus, this raise the fact that maternal diet can also lead to risk of allergy among breastfed infants. This is supported by Kim *et al*. (2019) that maternal diet during pregnancy and breastfeeding contributed to the allergy prevalent among infants. Thus, knowledge on maternal diet that can influence breast milk is important in the prevention of allergy among breastfed infants.

Regarding attitude, majority of BPC (44.4%) in this study shows positive attitude towards maternal diet and allergy while 40.3% had moderate level of attitude and only 15.3% of participants had negative attitude towards maternal diet and allergy. This is supported by Ikhsan *et al*. (2016) that 67% of women have a good attitude towards nutritional intake during pregnancy. This indicate that majority of the women have positive attitude in terms of nutrition aspect. Tenaw *et al.* (2018) also mentioned that only 48.4% of mothers had favorable attitude towards maternal dietary intake while the rest had unfavorable attitude. According to Pem *et al*. (2016) the individual differences may be the factor for individual to change their diet and the ability to turn intentions into actions. Thus, contribute to different outcomes in different research.

In the current studies, majority of the participants have good attitude on the importance of healthy and balanced diet for mothers (95.8%). It is important for the participants to have good attitude towards the importance of practicing healthy and balanced diet to prevent the allergy among breastfed infants. This is mentioned by Lowensohn *et al.* (2016), the optimal nutrition intake is important as early as before pregnancy as the nutrient will be transferred to the placenta or fetus. Thus, maternal dietary intake will contribute to the infant's health status. Most of the participants in this study also shows positive attitude on maternal diet that influenced the nutrient in the breast milk (97.2%). The least positive attitude among participants was on the recommendation of fruits and vegetables intake (20.8%). Apart from that, majority of the participants were lacking of positive attitude on the intake of fruits and vegetables that do not cause the allergy (37.5%), the use the mixture of baking powder, vinegar and water to replace the use of eggs in baking (30.5%) and the attitude on peanut oil do not cause the allergy (26.4%). According to Pem *et al*. (2016) the individual differences may be the factor for individual to change their diet and the ability to turn intentions into actions. Taken together, these results shows that there is a room for an improvement of

attitude among the participants that can be done in the intervention.

Moreover, the results in this study also suggested there is no association of socio-demographic characteristics with maternal knowledge and attitude. This results were consistent with the previous study by Ikhsan *et al*. (2016) as there is no relationship between all of the socio demographic with the attitude on nutritional intake. This is not in line with Pem *et al*. (2016) that shows the significant result between nutritional knowledge and age (p = 0.000), gender (0.039) and education level (p = 0.000). The previous studies indicated that there were significant association between occupation and knowledge score on dietary intake among mothers in Kelantan (Lim *et al*., 2018). Association of knowledge with occupation had also been reported Mugyia *et al*. (2016), that one of the socio-demographic factors that affect the good nutritional knowledge among Malaysian women is the occupation status. Thus, this study shows so association of knowledge and attitude of maternal diet and allergy with socio-demographic characteristics that raise the possibilities that all the participants had been exposed to the same training as BPC in order to become the BPC members.

However, the current study found that there is significant correlation between knowledge of maternal diet and allergy with attitude scores towards maternal diet and allergy with *p*-value of less than 0.05. The correlation is positive and moderate for association with knowledge and attitude. Thus, the results proved that the individual's knowledge has association with attitude. Most of the respondents with good knowledge on maternal diet and allergy also shows positive attitude toward maternal diet and allergy. This study is consistent with Ikhsan *et al.* (2016) that the knowledge has a statistically significant relationship with attitude on nutritional intake. This is similar to Fasola *et al.* (2018) that knowledge and attitude among respondents towards good nutrition have significant association.

Overall, it is important for the BPC to have good level of knowledge on maternal diet and allergy so that they can deliver the correct information and knowledge to the mothers in future. As support by Lim *et al.* (2018) that nutrition knowledge for mothers is important as it influenced the susceptible to nutritional deficiency and dietary behaviors. Having BPC also give greater impact on the breastfeeding outcome among mothers (White, 2019). These findings suggested that it is plausible to improved knowledge on maternal diet and allergy in order to correct the perception among BPC to have positive attitude. However, other studies showed different findings that other factors determine the attitude on maternal diet and allergy.

CONCLUSION

The present findings indicated that the BPC in Pahang had good knowledge and positive attitude on maternal diet and allergy. There was no significant association between socio-demographic factors and knowledge and attitude among BPC in Pahang. However,

there was a significant moderate-good correlation between the element of knowledge on maternal diet and allergy with attitude (r=0.668, p=0.001). This study also emphasize the need and the importance of empowering the BPC with proper nutrition educations and latest information on maternal diet and allergy prevention for better health outcome. It is also important for the mothers to have a good knowledge and attitude on maternal diet and allergy by having knowledgeable BPC. Hence, the mothers can get adequate information especially on the prevention of allergy besides getting the knowledge on breastfeeding practice. It is hoped that the BPC's knowledge and attitude can be improved more in the future in order to help all the mothers to prevent allergic diseases among breastfed infants or better quality of life.

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