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# Breastfeeding Knowledge, Attitude, and Practices and it's Association with Food Insecurity during COVID-19

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## Abstract
**Introduction:** Child hunger commonly occurs in families with household food insecurity when mothers fail to continue breastfeeding due to stress and inability to produce sufficient breastmilk. This study aimed to investigate the association of breastfeeding knowledge, attitude, and practices (KAP) with food insecurity during the pandemic of COVID-19. **Method:** An online self-administered questionnaire related to the study was used to obtain data from 444 Malaysian **Result:** Findings showed that majority of the mothers have moderate to good knowledge, attitude and practices in breastfeeding. However, food insecurity and child hunger still occur. **Conclusion:** These findings may be helpful for healthcare professionals in developing effective strategies for continuation of breastfeeding during the pandemic.

Keywords: Breastfeeding knowledge; breastfeeding attitude; breastfeeding practices; food insecurity; COVID-19.

## 1.0 Introduction
Breastmilk is notable as infant's most ideal feed. It provides sufficient requirement of calories and nutrient for the baby. Colostrum produces antibodies that protects the babies and prevent common childhood diseases (Martin, Ling & Blackburn, 2016). The World Health Organisation (WHO) and the United Nations International Children's Emergency Fund (UNICEF) suggested that breastfeeding should be initiated within the first hour of birth and should be continued for the first six months of life. Babies should only start eating appropriate and nutritious complementary foods starting from six months of age and continue to be breastfeed until two years of age or beyond (World Health Organization, 2018). Meanwhile, the COVID-19 pandemic has increased global food insecurity in almost every country by reducing incomes and disrupting food supply chains. Food insecurity which has been defined as lack of access to adequate, safe, and nutritious

food due to unavailability of food and limited resources, is linked to shorter duration of breastfeeding, early breastfeeding cessation due to perceived milk insufficiency and maternal malnutrition (Gomes GP & Gubert MB, 2012, Miller JD, Young SL, Boateng GO, Oiye S & Owino V, 2019).

## 2.0 Literature Review

In Malaysia, the National Plan of Action for Nutrition of Malaysia III (NPANM III) 2016-2025 identified another indicator regarding Promoting of Maternal, Infant and Young Child Nutrition, which is intended to achieve a minimum of 70% of infants under six months of age who are exclusively breastfed by 2025. However, the incidence of exclusive breastfeeding in Malaysia is below the defined average as it was just 47.1% in 2016. (Mohamad Pilus, Ahmad & Zulkefli, 2019). Furthermore, research on Malaysian primipara in postnatal treatment has shown that those with satisfactory experience of exclusive breastfeeding have a better chance of doing so. In contrast, those with poor knowledge have not. Only 77.8% (n = 126) of the respondents acknowledge that breastmilk contains colostrum which contains antibodies and are clueless about the colostrum benefits. Only 59.9% (n = 97) of the respondents breastfeed their newborn exclusively (A. Aziz & Khuan, 2014).

Breastmilk has several nutritional advantages and has been associated with lower short-term morbidity and death from gastrointestinal and respiratory illnesses (Raheem, Binns & Chih, 2017). Food insecurity is another global problem that has been occurring in most developed and developing countries, resulting in poor health and nutritional consequences (Mohamadpour, Sharif & Keysami, 2012). Large families are at higher risk of experiencing food insecurity rather than people of smaller household sizes. The family income per capita declines as household size expands, which leads to food insecurity within the household (Pai, Aappannah & Sulaiman, 2018).

The emergence of the COVID-19 pandemic has caused a global food crisis threatening the food and nutrition system, affecting mainly marginalized populations (Mishra & Rampal, 2020). Precautions taken globally to flatten and monitor the occurrence of infection have significantly impacted the economic sector, leading to substantial intrusions concerning food accessibility and food insecurity. In Selangor, Malaysia, 25% of women suffered a significant loss of income when their job contracts were terminated, forced to shut down their businesses or were instructed on unpaid leave. In addition, 43% of females suffered a household income decline due to movement control order (MCO) (Subki et al., 2020). In Kenya, a longitudinal cohort study showed that maternal hunger was associated with a lower incidence of breastfeeding. It was reported that mothers with high self-efficacy practice breastfeeding better compared to mothers with low self-efficacy, in which hunger may evoke a sense of lack of milk in mothers and also lower their self-efficacy to breastfeed efficiently (Tuthil et al., 2020).

Identifying the breastfeeding knowledge, attitude and practices (KAP) of Malaysian mothers during COVID-19 may facilitate health professionals to develop strategies for promoting breastfeeding practices. In addition, study aims to determine food insecurity during a pandemic and its association with the breastfeeding status among Malaysian mothers.

| Nomenclature | |
|---|---|
| KAP | Knowledge, attitude and practices |
| NPANM III | National Plan of Action for Nutrition of Malaysia III |
| MCO | Movement Control Order |

## 3.0 Materials and Methods

### 3.1 Subjects and Study Design
This cross-sectional study involved Malaysian mothers with children aged five years old and below. Sample sizes were determined using convenience sampling method with a 95 % confidence interval, 0.5 standard deviations and a 5 % margin of error. The necessary sample size calculated from Raosoft, Inc. Software was 384 respondents. Nevertheless, this study acquired 444 respondents from each state in Malaysia except for Perlis. The online questionnaire was distributed through social applications such as Whatsapp groups and Twitter, and the duration of recruitment was from September 2020 to October 2020. The inclusion criteria were mother aged 18 to 50 years old with children aged five years and below, able to read and understand Malay language, breastfeeding mothers, and mothers who can breastfeed without any medical issues.

### 3.2 Data Collection
An online self-administered questionnaire consisting of 78 questions was divided into five sections and was disseminated through social media platforms. A forward and back translation method was used for all questionnaires and Cronbach's alpha was used to measure internal consistency. A Cronbach's alpha of 0.70 or more is considered to be satisfactory. Data were collected from September 2020 to October 2020.

### 3.3 Sociodemographic Data and Breastfeeding Profile
The questionnaire includes the age of mother and spouse, region, educational level and occupation, household size and income, method of delivery of last child and length of breastfeeding since birth. The first, second and third section of this questionnaire are regarding the

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sociodemographic data of breastfeeding mothers and their spouse (if any) and the breastfeeding profile of lactating mothers.

### 3.4 Breastfeeding Knowledge, Attitude, and Practices (KAP)

The breastfeeding knowledge, attitude and practices questionnaire was adapted from Krishnendu and Devaki (2017). The components of knowledge, attitudes and practices used in this questionnaire have been derived from the Food and Agricultural Organization of the United Nations (FAO) guidelines to assess nutrition-related knowledge, attitudes, and practices. This FAO questionnaire was field-tested in numerous countries to ensure validity, readability, ease of administration and less complexity for respondents. Krishnendu and Devaki (2017), stated that the questionnaire developed based on the FAO questionnaire in their study was pre-tested on ten women for accuracy, validity, and ease of data collection.

This section of the questionnaire includes questions of the perception on exclusive breastfeeding and colostrum and the use of galactagogues. Breastfeeding knowledge was asked by choosing either "yes" or "no". Meanwhile, the attitude of mothers towards breastfeeding was assessed by including nine questions to be answered using 3-point Linkert scale by choosing "agree", "unsure" or "disagree" to help define whether its positive or negative. Regarding breastfeeding practices, it consists of six multiple-choice questions, which include the length of feeding, the supply of prolateral feed and dietary practices. In totalling the final score for each component of knowledge, attitude, and practices, every question correctly answered will be marked as "1" while "0" is marked as wrong answers. A total score for mother's knowledge, attitude, and practices of breastfeeding are 8, 9 and 6, respectively.

### 3.5 Food Insecurity

The fifth section of the questionnaire was adapted from the Malay-translated Radimer/Cornell Hunger and Food Insecurity instrument (Sharifl ZM & Ang M, 2001). It has ten 3-point Linkert scale questions, which represents the four extremely severe levels of household food insecurity, food secure, household food insecurity, individual food insecurity and child hunger. Participants were required to respond to these 3-point scale questions in which one is "never", two is "sometimes", and three is "always" by choosing their answer. The internal consistency (Cronbach's alpha) of the ten elements of these instruments in previous study was 0.8-0.9 (Kendall, Olson & Frongillo, 1995).

### 3.6 Breastfeeding Precautions and Livelihood Impact During COVID-19

In the last two sections of the questionnaire, knowledge of the guidelines on breastfeeding during COVID-19 was assessed. This section consists of six 3-point Linkert scale questions which questions were adapted from WHO's frequently asked questions regarding breastfeeding (World Health Organization, 2020). The choices the answer given for these questions were "agree", "unsure" and "disagree". Lastly, the food security and livelihood impact due to COVID-19 were assessed by using questionnaire adapted from the Regional Summary Report of Caribbean COVID-19 Food Security and Livelihood Impact Survey done in April 2020 launched by the Caribbean Community (CARICOM) (World Food Programme, 2020). Nine multiple choice questions are included in this section to assess the limitations faced and the impact of COVID-19 on respondents' livelihoods. No scores were given for these sections, as the results will be tabulated in frequency and percentage.

### 3.7 Ethical Consideration

The respondents of this study participated voluntarily, and data was collected anonymously. Informed consent was obtained from participants prior to the recruitment. This study was approved by UiTM Research Ethics Committee REC/01/2021 (UG/MR/40).

### 3.8 Data Analysis

Statistical Package of Social Sciences (SPSS) version 26.0 was used to analyse the obtained data. Before analysing the results obtained on breastfeeding knowledge, attitude and practices, the scores are categorised; for breastfeeding knowledge, a score of 0-3 was coded as poor, 4-5 was coded as moderate, and 6-8 was coded as good. As for breastfeeding attitude, 0-3 was coded as poor, 4-6 was coded as moderate, and 7-9 was coded as good. Lastly, for breastfeeding practices, 0-2 are coded as poor, 3-4 are coded as moderate, and 5-6 are coded as good. Aside from that, Radimer/Cornell Hunger and Food Insecurity scores are categorised in which 0 was coded as food secure, 1-4 was coded as household food insecurity, 5-7 was coded as individual insecurity, and 9-10 was coded as child hunger. All analysed data of the socio-demographic characteristics, breastfeeding knowledge, attitude and practices, Radimer/Cornell Hunger and Food Insecurity, breastfeeding precautions and livelihood impact during COVID-19 were reported as descriptive statistics and were tabulated in frequency and percentage. The association between categorical variables was determined using the chi-square test. To determine the relationship between the categorical variables, such as socio-demography with breastfeeding KAP and food insecurity, and breastfeeding KAP with food insecurity, the chi-square test was used. Significance between two categorical variables will be noted if p-value is less than 0.05 (p ≤ 0.05).

## 4.0 Findings

A total of 444 mothers with children under five years of age took part in this research. The mean age of mothers who participated in this study was 30.1 years old (σ = 4.313, n = 232). Mothers in this study are mostly Malays (96.6%, n = 429) while those in the minority group in this study are Chinese (1.4%, n = 6), Indians (0.5%, n = 2) and others (1.6%, n = 7). The majority of mothers are from the Central region of Malaysia (65.8%, n = 292). Most of the mothers were college or university graduates (95.5%, n = 424). Majority of them were working (74.1%, n = 329), while the other quarter of them were housewives (25.9%, n = 115). About 82.4% (n = 366) of mothers in this study have a maximum of two children and only one child aged five years old and below (68%, n = 302). Most respondents reported had breastfed

their children until the age of 18 to 24 months since birth (34.2%, n = 152), and 82.4% (n = 336) had or will continue to breastfeed their last child until their babies were two years old.

*4.1 Breastfeeding Knowledge, Attitude, And Practices*
Table 1 shows the association between mother's socio-demography characteristics and the status of knowledge, attitude, and practices of breastfeeding mothers. Almost all mothers have good breastfeeding knowledge with a mean score of 6.8 (92.1%, n = 409), moderate attitude toward breastfeeding with a mean score of 5.7 (84.5%, n = 375), and good breastfeeding practices with a mean score of 5.0 (76.9%, n = 339). There are statistically significance associations between household income category, breastfeeding knowledge (p = 0.028) and breastfeeding practices (p = 0.037). No significance was found between the socio-demographic characteristics and their attitudes towards breastfeeding (p ≥ 0.05).

Table 1. Socio-demographic characteristic of women by the status of breastfeeding knowledge attitude and practices. (N = 444)

| Breastfeeding Knowledge | | | |
|---|---|---|---|
| **Measurement** | **Good** n = 408 (%) | **Moderate** n = 32 (%) | **Poor** n = 4 (%) | **p value and chi-square value** |
| **Region** | | | | *p* = 0.319, |
| Northern | 31 (7.6) | 5 (16.1) | 0 | χ2 = 2.286 |
| East Coast | 21 (5.1) | 2 (6.5) | 0 | |
| Central | 269 (65.8) | 21 (67.7) | 2 (50) | |
| Southern | 79 (19.3) | 3 (9.7) | 2 (50) | |
| East | 9 (2.2) | 0 | 0 | |
| **Education** | | | | *p* = 0.167, |
| College/University | 391 (95.6) | 29 (93.5) | 4 (100) | χ2 = 3.578 |
| Secondary school | 18 (4.4) | 2 (6.5) | 0.00 | |
| **Occupation** | | | | *p* = 0.394, |
| Salaried work - government | 78 (19.1) | 7 (22.6) | 0 | χ2 = 1.865 |
| Salaried work - private | 150 (36.7) | 11 (35.5) | 2 (50) | |
| Business / work from home | 74 (18.1) | 5 (16.1) | 2 (50) | |
| Housewife | 107 (26.2) | 8 (25.8) | 0 | |
| **Marital Status** | | | | *p* = 0.694, |
| Married | 400 (97.8) | 28 (90.3) | 4 (100) | χ2 = 0.730 |
| Single mother | 9 (2.2) | 3 (9.7) | 0 | |
| **Household income category** | | | | *p* = 0.028*, |
| B40 (≤ RM 2, 500.00 - RM 4, 849.00) | 194 (47.4) | 18 (58) | 0 | χ2 = 7.116 |
| M40 (RM 4, 850.00 - RM 10,959.00) | 173 (42.3) | 11 (35.5) | 2(50) | |
| T20 (RM 10, 961.00 - RM 15,040.00 ≥) | 42 (10.3) | 2 (6.5) | 2(50) | |

| Breastfeeding Attitude | | | |
|---|---|---|---|
| **Measurement** | **Good** n = 61 (%) | **Moderate** n = 375 (%) | **Poor** n = 8 (%) | **p value and chi-square value** |
| **Region** | | | | *p* = 0.209, |
| Northern | 0 | 35 (9.3) | 1 (12.5) | χ2 = 3.127 |
| East Coast | 1 (1.6) | 21 (5.6) | 1 (12.5) | |
| Central | 50 (82) | 236 (62.9) | 6 (75) | |
| Southern | 8 (13.1) | 76 (20.3) | 0 | |

| | | | | |
|---|---|---|---|---|
| East | 2 (3.3) | 7 (1.9) | 0 | |
| **Education** | | | | $p$ = 0.183, |
| College/University | 59 (96.7) | 357 (95.2) | 8 (100) | χ2 = 3.395 |
| Secondary school | 2 (3.3) | 18 (4.8) | 0.00 | |
| **Occupation** | | | | $p$ = 0.845, |
| Salaried work - government | 7 (11.5) | 77 (20.5) | 1 (12.5) | χ2 = 0.338 |
| Salaried work - private | 29 (47.5) | 132 (35.2) | 2 (25) | |
| Business / work from home | 9 (14.8) | 70 (18.7) | 2 (25) | |
| Housewife | 16 (26.2) | 96 (25.6) | 3 (37.5) | |
| **Marital Status** | | | | $p$ = 0.542, |
| Married | 60 (98.4) | 364 (97.1) | 8 (100) | χ2 = 1.225 |
| Single mother | 1 (1.6) | 11 (2.9) | 0 | |
| **Household income category** | | | | $p$ = 0.651, |
| B40 (≤ RM 2, 500.00 - RM 4, 849.00) | 26 (42.6) | 182 (48.5) | 4 (50) | χ2 = 0.858 |
| M40 (RM 4, 850.00 - RM 10,959.00) | 29 (47.5) | 155 (41.3) | 2 (25) | |
| T20 (RM 10, 961.00 - RM 15,040.00 ≥) | 6 (9.8) | 38 (10.1) | 2 (25) | |

| Breastfeeding Practices | | | |
|---|---|---|---|
| **Measurement** | **Good**<br>**n = 339 (%)** | **Moderate**<br>**n = 103 (%)** | **Poor**<br>**n = 2 (%)** | **p value and chi-square value** |
| **Region** | | | | $p$ = 0.909, |
| Northern | 26 (7.7) | 9 (8.7) | 1 (50) | χ2 = 0.190 |
| East Coast | 15 (4.4) | 8 (7.8) | 0 | |
| Central | 228 (67.2) | 63 (61.2) | 1 (50) | |
| Southern | 61 (18) | 23 (22.3) | 0 | |
| East | 9 (2.7) | 0 | 0 | |
| **Education** | | | | $p$ = 0.761, |
| College/University | 322 (95) | 100 (97.1) | 2 (100) | χ2 = 0.546 |
| Secondary school | 17 (5) | 3 (2.9) | 0.00 | |
| **Occupation** | | | | $p$ = 0.251, |
| Salaried work - government | 65 (19.2) | 19 (18.4) | 1 (50) | χ2 = 2.767 |
| Salaried work - private | 124 (36.6) | 39 (37.9) | 0 | |
| Business / work from home | 58 (17.1) | 22 (21.4) | 1 (50) | |
| Housewife | 92 (27.1) | 23 (22.3) | 0 | |
| **Marital Status** | | | | $p$ = 0.754, |
| Married | 330 (97.3) | 100 (97.1) | 2 (100) | χ2 = 0.565 |
| Single mother | 9 (2.7) | 3 (2.9) | 0 | |
| **Household income category** | | | | $p$ = 0.037*, |
| B40 (≤ RM 2, 500.00 - RM 4, 849.00) | 162 (47.8) | 50 (48.5) | 0 | χ2 = 6.587 |
| M40 (RM 4, 850.00 - RM 10,959.00) | 144 (42.5) | 41 (40) | 1 (50) | |
| T20 (RM 10, 961.00 - RM 15,040.00 ≥) | 33 (9.7) | 12 (11.65) | 1 (50) | |

* Data between the two groups were analyzed using Chi-square test.
* P – value marked with (*) are statistically significant (p ≤ 0.05)

### 4.2 Mother's Knowledge on Breastfeeding Precautions During Pandemic Of COVID-19

Referring to Table 2, near half of the mothers are conscious that COVID-19 is not transmitted to their children through breastmilk (46.6% n = 207). The majority of mothers concur that breastfeeding shall be continued as usual during the pandemic (83.3%, n = 370). Nearly half of the mothers opposed the idea that breastfeeding should be initiated immediately after birth even if the mother was suspected or was found to be positive for COVID-19 (44.4%, n = 197). They agree that mothers suspected or confirmed to be positive for COVID-19 should not continue to breastfeed their child (41%, n = 186). About 51.6% (n = 229) of mothers were unclear whether they could continue breastfeeding if a COVID-19 positive mother continued breastfeeding without wearing a face mask.

Table 2. Mother's knowledge on breastfeeding precautions during the pandemic of COVID-19 (N=444).

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **I am aware that COVID-19 cannot be passed through breastfeeding.** | | |
| Agree | 207 | 46.6 |
| Unsure | 42 | 9.5 |
| Disagree | 195 | 43.9 |
| **A mother should continue to breastfeed their child as usual during the pandemic.** | | |
| Agree | 370 | 83.3 |
| Unsure | 14 | 3.2 |
| Disagree | 60 | 13.5 |
| **A newborn should be breastfed directly after birth even though the mother is suspected/confirmed positive with COVID-19.** | | |
| Agree | 124 | 27.9 |
| Unsure | 123 | 27.7 |
| Disagree | 197 | 44.4 |
| **Breastfeeding should be continued even though the mother is suspected/confirmed to be positive.** | | |
| Agree | 131 | 29.5 |
| Unsure | 131 | 29.5 |
| Disagree | 182 | 41 |
| **I am aware of COVID-19 prevention methods while breastfeeding.** | | |
| Agree | 235 | 52.9 |
| Unsure | 23 | 5.2 |
| Disagree | 186 | 41.9 |
| **Mothers who are suspected/confirmed to be positive with COVID-19 may continue to breastfeed their child even without wearing a face mask.** | | |
| Agree | 25 | 5.6 |
| Unsure | 229 | 51.6 |
| Disagree | 190 | 42.8 |

### 4.3 Food Insecurity Status

More than half of the participants in this study were food secured (55.2%, n = 245). Meanwhile, 25% (n = 111) of them were categorised as household food insecure, 12.6% (n = 56), individual food insecure, and 7.2% (n = 32) were classified as child hunger. Table 3 indicates the relationship between the socio-demographic characteristics of mothers and their food insecurity status. A significant declined pattern was observed in household income groups, $x^2$ = 35.338, p<0.001.

Table 3. Socioeconomic and demographic characteristic of women by food security status (N=444).

| Measurement | Food-secure n = 245 (%) | Household food insecurity n = 111 (%) | Individual food insecurity n = 56 (%) | Child hunger n = 32 (%) | p value and chi-square value |
|---|---|---|---|---|---|
| **Region** | | | | | *p* = 0.796, |

| | | | | | |
|---|---|---|---|---|---|
| Northern | 18 (7.3) | 10 (9) | 5 (8.9) | 3 (9.3) | $\chi^2 = 1.021$ |
| East Coast | 14 (5.7) | 8 (7.2) | 1 (1.8) | 0 | |
| Central | 162 (66.1) | 64 (57.7) | 42 (75) | 24 (75) | |
| Southern | 46 (18.8) | 26 (23.4) | 7 (12.5) | 5 (15.6) | |
| East | 5 (2.1) | 3 (2.7) | 1 (1.8) | 0 | |
| **Occupation** | | | | | $p = 0.500,$ |
| Salaried work - government | 57 (23.3) | 19 (17.1) | 8 (14.3) | 1 (3.1) | $\chi^2 = 2.367$ |
| Salaried work - private | 89 (36.3) | 39 (35.1) | 24 (42.9) | 11 (34.4) | |
| Business / work from home | 48 (19.6) | 19 (17.1) | 7 (12.5) | 7 (21.9) | |
| Housewife | 51 (20.8) | 34 (30.6) | 17 (30.4) | 13 (40.6) | |
| **Marital Status** | | | | | $p = 0.406,$ |
| Married | 242 (98.8) | 107 (96.4) | 53 (94.6) | 30 (93.8) | $\chi^2 = 2.907$ |
| Single mother | 3 (1.2) | 4 (3.6) | 3 (5.4) | 2 (6.3) | |
| **Household size category** | | | | | $p = 0.132,$ |
| Small (≤ 5 people) | 228 (93.1) | 102 (91.9) | 51 (91.1) | 25 (78.1) | $\chi^2 = 5.617$ |
| Large (≥ 6 people) | 17 (6.9) | 9 (8.1) | 5 (8.9) | 7 (21.9) | |
| **Household income category** | | | | | $p < 0.001^*,$ |
| B40 (≤ RM 2, 500.00 - RM 4, 849.00) | 84 (34.3) | 70 (63.1) | 36 (64.3) | 22 (68.8) | $\chi^2 = 35.388$ |
| M40 (RM 4, 850.00 - RM 10,959.00) | 121 (49.4) | 37 (33.3) | 19 (33.9) | 9 (28.1) | |
| T20 (RM 10, 961.00 - RM 15,040.00 ≥) | 40 (16.3) | 4 (3.4) | 1 (1.8) | 1 (3.1) | |

∗  Data between the two groups were analyzed using Chi-square test.
*P* – value marked with (*) are statistically significant ($p ≤ 0.05$)

*4.4 Food Security and Livelihood Impact During Movement Control Order (MCO) Due To Covid-19 Pandemic*
During MCO some respondents faced several limitations, and their ability to carry out livelihood are somehow affected, as shown in Table 4. Almost half of the respondents (41.9%, n = 186) and household members had restricted access to markets or grocery stores. Previously, before the initiation of MCO, most of the respondent's primary source of household income was working in the private sector (65.5%, n = 291). Over a quarter of the respondents reported that their livelihood activities were not affected during the MCO 31.1% (n = 147). Although 30% (n = 113) were minorly affected, 27.8% (n = 104) was affected at an average state, and 9.2% (n = 41) was critically affected. Almost three quarter of the respondents face no trouble getting adequate food during the MCO period (62.2%, n = 276). Majority of the respondents had adequate food throughout the MCO period (92.8%, n = 412). Regrettably, 7.2 per cent (n=32) faced problems in getting enough food during the MCO.

Table 4. Food Security and Livelihood Impact during Movement Control Order Due to COVID-19 Pandemic (N=444).

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **During MCO, has there been a time when you and your household could not access the markets/grocery stores?** | | |
| Yes | 186 | 41.9 |
| No | 258 | 58.1 |
| **If the answer to the previous question is yes, what was the reason you and your household could not access the markets/stores?** | | |
| Merkets/stores were closed | 4 | 0.9 |
| Transport limitation | 3 | 0.7 |
| Movement restriction | 58 | 13.1 |
| Health and security concerns | 119 | 26.8 |
| Members of household are unwell/self-quarantining | 2 | 0.5 |

| | | |
|---|---|---|
| None | 258 | 58.1 |

**During MCO, are fresh food items readily available in markets/stores?**

| | | |
|---|---|---|
| Always available | 373 | 84 |
| Partially/sometimes available | 58 | 13.1 |
| Unavailable | 0 | 0 |
| Unsure | 13 | 2.9 |

**During MCO, are basic food items readily available in markets/stores?**

| | | |
|---|---|---|
| Always available | 396 | 89.2 |
| Partially/sometimes available | 38 | 8.6 |
| Unavailable | 2 | 0.5 |
| Unsure | 8 | 1.8 |

**During MCO, are hygiene items readily available in markets/stores?**

| | | |
|---|---|---|
| Always available | 305 | 68.7 |
| Partially/sometimes available | 124 | 27.9 |
| Unavailable | 4 | 0.9 |
| Unsure | 11 | 2.5 |

**During MCO, are essential medicines readily available in markets/stores?**

| | | |
|---|---|---|
| Always available | 388 | 87.4 |
| Partially/sometimes available | 30 | 6.8 |
| Not Available | 0 | 0 |
| Unsure | 26 | 5.9 |

**Has there been any changes in the costs of food items during MCO?**

| | | |
|---|---|---|
| Food prices have increases | 198 | 44.6 |
| Food prices have decreases | 13 | 2.9 |
| No changes | 233 | 52.5 |

**Have you changed your shopping behavior compared to normal times?**

| | | |
|---|---|---|
| Yes | 329 | 74.1 |
| No | 115 | 25.9 |

**If the answer to the previous question is yes, how have you changed your shopping behavior?**

| | | |
|---|---|---|
| Buying larger quantities than usual | 184 | 41.4 |
| Buying smaller quantities than usual | 29 | 6.5 |
| Buying cheaper or less preferred foods than usual | 80 | 18 |
| Going to different stores | 36 | 8.1 |
| None | 115 | 25.9 |

**Was your ability to carry out livelihood activities affected during MCO?**

| | | |
|---|---|---|
| Yes | 162 | 36.5 |
| No | 282 | 63.5 |
| **If the answer to the previous question is yes, what was the main reason for the disruption of your livelihood activities?** | | |
| Reduced demand for goods/services | 41 | 9.2 |
| Reduced salaries/revenues | 64 | 14.4 |
| Loss of jobs/source of income | 57 | 12.9 |
| None | 282 | 63.5 |
| **What was your household's main income sources before MCO?** | | |
| Salaried work - Government | 99 | 22.3 |
| Salaried work - Private | 291 | 65.5 |
| Business | 42 | 9.5 |
| Small business | 10 | 2.3 |
| Help from family and friends | 1 | 0.2 |
| Government assistance/pension/EPF | 1 | 0.2 |
| **How was the impact of MCO to your livelihood?** | | |
| No impact | 147 | 33.1 |
| Little impact | 133 | 30 |
| Moderate impact | 123 | 27.8 |
| Severe impact | 41 | 9.2 |
| **Which statement best reflect your food situation during MCO?** | | |
| I had no difficulties eating enough food (normal pattern) | 276 | 62.2 |
| I ate less preferred foods | 146 | 32.9 |
| I skipped meals or ate less than usual | 6 | 1.4 |
| I went one whole day without eating | 1 | 0.2 |
| I increased my food intake | 15 | 3.4 |
| **Does your household always have enough food stock during MCO?** | | |
| Yes | 412 | 92.8 |
| No | 32 | 7.2 |

*4.5 Association of Food Insecurity and Breastfeeding*
Table 5 indicates that there was no statistical significance was observed between the mother's knowledge, attitude and practices toward breastfeeding with the status of food insecurity ($p \geq 0.05$).

Table 5. Food insecurity status by women breastfeeding KAP status (N=444)

| Breastfeeding knowledge, attitude, and practices status | Food-secure n = 245 (%) | Household food insecurity n = 111 (%) | Individual food insecurity n = 56 (%) | Child hunger n = 32 (%) | p value or chi – square value |
|---|---|---|---|---|---|
| **Breastfeeding knowledge** | | | | | $p = 0.094$, |
| Good | 230 (93.9) | 99 (89.2) | 51 (91.1) | 29 (90.6) | $\chi2 = 6.396$ |

| | | | | | |
|---|---|---|---|---|---|
| Moderate | 14 (5.7) | 11 (9.9) | 5 (8.9) | 1 (3.1) | |
| Poor | 1 (0.4) | 1 (0.9) | 0 | 2 (6.3) | |
| **Breastfeeding Attitude** | | | | | $p = 0.454$, |
| Good | 33 (13.5) | 15 (13.5) | 6 (10.7) | 7 (21.9) | $\chi2 = 2.622$ |
| Moderate | 206 (84.1) | 96 (86.5) | 48 (85.7) | 25 (78.1) | |
| Poor | 6 (2.4) | 0 | 2 (3.6) | 0 | |
| **Breastfeeding Practices** | | | | | $p = 0.998$, |
| Good | 189 (77.1) | 82 (73.9) | 44 (78.6) | 24 (75) | $\chi2 = 0.037$ |
| Moderate | 55 (22.5) | 28 (25.2) | 12 (21.4) | 8 (25) | |
| Poor | 1 (0.4) | 1 (0.9) | 0 | 0 | |

## 5.0 Discussion

Our study was conducted to assess the knowledge, attitudes, and practices of breastfeeding among mothers in Malaysia and its association with food insecurity during COVID-19. In finding the potential cause related to household food insecurity, this study found that household income was statistically significant ($p \le 0.05$), which indicates that these factors contribute to the determination of food security status. It is suggested that household income and household size contribute to the risk of food insecurity as increased household members increase household expenses. In a previous study done in Sabah, Malaysia, their results have shown that they are often confused about supplying or unable to provide enough food for all household members because they have insufficient resources and other food facilities (Farhadian et al., 2015; Farzana et al., 2017).

During movement control order (MCO) in Malaysia, certain respondents have access to readily available fresh food products, necessary food items, hygiene items and necessary medicines. However, in some regions, such as rural areas, have had difficulty obtaining basic everyday supplies. Another potential source of supply instability in markets and grocery stores could be attributed to panic buying after MCO's announcement that some industries have been forced to close (Leddy at al., 2020). This occurs because people are not allowed to resume their employment operations, and workers are required to operate from home (Pakravan-Charvadeh et al., 2020).

Although this present study failed to show a significant association between knowledge of breastfeeding with food security status however, almost half of the mothers with household food insecurity have been unable to maintain breastfeeding exclusively and mostly quit at two months. On the other hand, mothers who are food secure can continue breastfeeding exclusively until at least four months of age (Orr, Dachner, Frank and Tarasuk, 2018). Witten et al. (2020) suggest that reducing maternal hunger by enhancing the stability of household food supplies and boosting maternal self-efficacy may increase exclusive breastfeeding practice.

In studying the intensity of breastfeeding knowledge, attitudes and practices among Malaysian mothers reveal that most of the mothers who participated in the study are aware of the benefits of breastfeeding and breastmilk for their infants and have a good attitude and practice towards breastfeeding. Furthermore, most mothers in this survey are university graduates and all of them breastfeed their children. In support of this observation, according to a previous report by Hamze, Jing and Reifsnider (2019), mothers with higher education had more experience in breastfeeding. In this report, a total of 92.1% (n = 409) of mothers have good knowledge of breastfeeding.

As supported by previous studies, the practice of breastfeeding in career women varies according to the state they live in. Some factors contributing to the difference in breastfeeding practices include breastfeeding guidance received before and after childbirth and exposure to breastfeeding at young age (Abdul Rashid et al., 2018).

The finding shows that there are still mothers who are unaware of the precautions and guidelines provided on breastfeeding following COVID-19. The World Health Organisation (WHO) released a guideline for breastfeeding mothers to understand the situation better and follow. There are some minor differences between the breastfeeding guidelines by WHO and Ministry of Health Malaysia. According to the WHO international guidelines, a suspected or confirmed mother should continue to breastfeed her child while taking precautions, such as maintaining good hygiene, as new-borns and infants are less likely to be at risk. Meanwhile, in Malaysia the guidance issued by the Ministry of Health reported that mothers should not continue breastfeeding and should be separated from their children until they are confirmed to be negative.

Results collected from an online survey may allow bias to be retrieved, since some of the answers provided may not be correct and may also be due to the failure to fully understand such terms and questions. To achieve more accurate and precise result in future studies, developing or using a more suitable questionnaire relating to breastfeeding and food insecurity is recommended. The findings of this study will still be beneficial to assist in future studies with similar area in finding the appropriate interventions to improve the prevalence of breastfeeding practices among mothers in Malaysia and help reduce the occurrence of child hunger over time.

## 6.0 Conclusion and Recommendations

During this pandemic, half of the participants were food secure, however, few of their livelihoods were still affected by the pandemic. Since

food insecurity was found to be associated with breastfeeding knowledge, these findings may provide insight and facilitate health professionals to develop solutions and interventions for government and non-government bodies in implementing strategies to promote breastfeeding practices amongst those experiencing food insecurity in preventing child malnutrition. Holistic approach from multidisciplinary industries is also important to develop intersectoral food safety, nutrition and supply chain action plan to combat food insecurity and improve overall well-being within the targeted population.

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