Mal J Nutr 31(1): 113-125, 2025

Mothers' knowledge, attitudes, and practices on infant and young child feeding in selected municipalities in Bangsamoro Autonomous Region in Muslim Mindanao, Philippines: A cross-sectional study

Maria Theresa M Talavera[1*], Angelina R Bustos[1], Divine Grace C Domingo[1], Nancy A Tandang[2], Leila S. Africa[1], Angelina DR. Felix[1], Anna Teresa O Orillo[3], Warren TK Lee[4] & Maria Cecile F. Pastores[5]

[1]*Institute of Human Nutrition and Food, College of Human Ecology, University of the Philippines Los Banos;* [2]*Institute of Statistics, College of Sciences, University of the Philippines Los Banos;* [3]*Chandler Regional Medical Center, Arizona, USA;* [4]*Food and Agriculture Organization-RAPA;* [5]*Food and Agriculture Organization-Philippines*

ABSTRACT

Introduction: Optimal infant and young child feeding (IYCF) practices are essential for improving the nutritional status of young children. In Maguindanao, Bangsamoro Autonomous Region of Muslim Mindanao (BARMM), there is a high prevalence of malnutrition among infants and young children. Information on mothers' knowledge, attitudes, and practices (KAP) regarding IYCF is limited. This study aimed to assess the current KAP of mothers regarding IYCF and explore the factors influencing these practices. **Methods:** A cross-sectional study was conducted involving 320 mothers of children aged 6 - 23 months using a pre-tested questionnaire. Data were collected by trained researchers. **Results:** Mothers showed strong knowledge on breastfeeding, with over 90.0% recognising its importance during illness and proper breastfeeding techniques. They also have positive attitudes, with 99.4% acknowledging breastfeeding's health benefits, 96.9% its economic value, and 96.8% its role in emotional bonding. Analysis showed significant positive association between education and attitude (p=0.001), while there were no significant association with knowledge (p=0.058) and practice (p=0.091). Income levels showed no significant associations with knowledge (p=0.388), attitude (p=0.061), and practice (p=0.419). **Conclusion:** Addressing knowledge and attitude gaps through nutrition messages could enhance IYCF practices among mothers in Maguindanao, BARMM.

Keywords: attitudes, Bangsamoro Autonomous Region of Muslim Mindanao, infant and young child feeding, knowledge, practices

INTRODUCTION

Optimal infant and young child feeding (IYCF) practices are crucial for improving child nutrition, health, growth, and development during the first two years of life (DOST-FNRI, 2022). Appropriate and timely breastfeeding and complementary feeding are two practices that can reduce undernutrition and mortality in infants and young children (Bhutta *et al.*, 2013). Stunting has irreversible effects on physical and mental developments

*Corresponding author: Maria Theresa M. Talavera
Institute of Human Nutrition and Food
College of Human Ecology
University of the Philippines Los Banos
Tel: +63-09171664115; E-mail: mmtalavera@up.edu.ph
doi: https://doi.org/10.31246/mjn-2024-0065

and reduces catch-up growth (de Onis & Branca, 2016).

Stunting prevalence in the Philippines has remained unchanged for the past three decades (Mbuya *et al.*, 2022). Prevalence rates are at 25.5% for stunting, 15.0% for underweight, and 7.4% for wasting (DOST-FNRI, 2022). In the Bangsamoro Autonomous Region of Muslim Mindanao (BARMM), undernutrition is a serious public health concern, with about 45.0% of children under the age of five affected by stunting, the highest prevalence in the country (World Food Program, 2023).

Suboptimal IYCF practices contribute to malnutrition in the country, including in the BARMM. Only 78.1% of infants aged six to eight months were reportedly given complementary foods (DOST-FNRI, 2013). Moreover, there are low figures for minimum diet diversity (13.8%) and minimum acceptable diet (13.3%) (DOST-FNRI, 2021). To address malnutrition and suboptimal feeding practices, national policies on IYCF were established, including the Department of Health Administrative Office 2005-0014. These policies align with global IYCF standards and are integrated into plans such as the Department of Health's Strategic Framework for Comprehensive Nutrition Implementation Plan 2014-2025, the Philippine Plan of Action for Nutrition (PPAN) 2017-2022 formulated by the National Nutrition Council, the Infant and Young Child Complementary Feeding Strategic Plan for 2019–2030 (DOH, 2019), and Republic Act 11148 An Act Scaling Up the National and Local Health and Nutrition Programs Through a Strengthened Integrated Strategy for Maternal, Neonatal, Child Health and Nutrition in the First One Thousand Days of Life, Appropriate Funds Therefore and for Other Purposes.

Information on mothers' knowledge, attitudes, and practices (KAP) on IYCF and the factors that influence their KAP is limited. Understanding IYCF practices of mothers living in the BARMM is therefore essential to properly address malnutrition. Moreover, improving IYCF practices presents a unique opportunity to modify nutritional outcomes and contribute to achieving the Sustainable Development Goal 2. This study aimed to assess the current KAP of mothers regarding IYCF and explore the factors influencing these practices.

MATERIALS AND METHODS

Study design and participants

This study employed a cross-sectional design to determine the knowledge, attitudes, and practices of mothers. The study involved mothers with children aged 6 - 23 months living in the two municipalities of Datu Paglas and Datu Anggal Midtimbang in Maguindanao province, Philippines. The inclusion criteria were that mothers must be Muslim, have resided in the chosen barangay or municipality for the past six months, and have a 6- to 23-month-old child who has no feeding problem and no congenital or severe illness during the time of recruitment.

Sampling design and sample size

The participants were selected using a two-stage sampling process, with the municipalities considered as the domain of the study. The barangays (villages) were the primary sampling units and selected through simple random sampling. Moreover, within the sampled barangays, children were selected from the Operation Timbang (OPT) list. The total number of respondents per municipality was estimated based on the proportion of children meeting the minimum acceptable diet (7.2%) (DOST-FNRI, 2013). Adjustments were made for a 90.0% response rate and a design effect of 2 to account for the complexity of the sampling design. This resulted in a total of 320 respondents, with each municipality having 160.

Table 1. Percent distribution of mothers based on their infant and young child feeding knowledge, attitudes, and practices in Maguindanao, BARMM

Knowledge statements (n=360)	*n*	*%*	*Attitude statements (n=360)*	*Percentage (%)*					*Practice statements*	*Percentage (%)*			
				SD	*D*	*N*	*A*	*SA*		*N*	*S*	*O*	*A*
Breastfeeding			**Breastfeeding**						**Hand washing and sanitation (n_{total}=317)**				
Breastfeeding should continue even when the child is sick.	295	92.2	I believe mother's milk is important for an infant.	0	0	0.6	64.5	34.9	I wash my hands with water and soap before preparing food.	0	1.9	32.7	65.4
Breastfeeding should be to the infant's demand.	285	89.1	I believe that breast milk is economical.	0	1.3	1.9	59.6	37.3	I make sure that my child's hands are washed with water and soap before he/she eats.	0	2.2	31.1	66.7
Infants can be given plain water during the exclusive breast-feeding period.	78	24.4	I think breast milk increases the bond between mothers and infants	0.6	0.3	2.2	65.5	31.3	I make sure that the plates, cups, spoons, and forks that my child will use are clean.	0	0.6	31.2	66.1
Breastfeeding should be continued until the infant is 2 years old or older.	292	91.3	I think breastfeeding should be continued in addition to complementary food.	0	2.2	4.7	85.6	7.5	I make sure that the cooked food kept at room temperature is given to my child within 2 hours.	2.5	8.8	33.6	55.0
The correct position during breastfeeding ensures effective breastfeeding.	296	92.5	**Complementary feeding**						**Responsive feeding (n_{total}=317)**				
Infants sleep well when they are getting sufficient breast milk.	300	93.8	I love preparing children's meals.	0	0.9	6.6	75.5	17.0	I interact with the children during the meal.	4.1	8.8	44.7	42.5
Colostrum can cause infants to have difficulty defecating.	160	50.0	I think the feeding frequency should be increased according to the child's age.	0.3	1.6	7.8	83.7	6.6	I give the children time to finish their food.	0.3	7.6	47.9	44.2
Breastmilk that looks diluted is less nutritious.	120	37.5	I will give frequent meals to children recovering from illnesses.	0	3.8	6.9	78.6	10.7	I do not scold or penalise the children if they refuse to eat.	6.3	35.8	29.9	28.0

to be continued...

... continuation

Knowledge statements (n=360)	*n*	*%*	*Attitude statements (n=360)*	*Percentage (%)*					*Practice statements*	*Percentage (%)*			
				SD	*D*	*N*	*A*	*SA*		*N*	*S*	*O*	*A*
Complementary feeding			I think complementary food should be introduced at an appropriate age.	0	3.8	8.2	82.1	6.0	**Feeding mother's milk to the baby (n_{total}=176)**				
Complementary feeding can be started at 4 months of age.	161	50.3	I believe interacting with children is important during feeding.	1.3	4.1	7.2	76.4	11.0	I wash my hands with water and soap before feeding milk to my baby.	3.2	2.9	34.8	59.4
After 6 months, breastmilk alone is insufficient to provide all an infant's nutritional needs	195	60.9	I am happy to prepare a variety of foods for the children.	0.6	8.2	9.1	67.9	14.2	I give expressed breast milk at an appropriate temperature.	23.3	10.8	22.7	43.2
Fruits can be given to a 7-month-old infant	250	78.1	I am comfortable using instant infant food.	0.6	6.6	12.3	68.2	12.3	I give expressed breast milk within an hour after thawing.	38.1	6.8	15.9	39.2
Family food can be given to a 9-month-old infant.	65	20.3	I think children should be given a variety of foods.	0.6	12.5	8.8	54.5	23.5	I discard the remaining expressed breast milk if it is not completely consumed.	36.9	10.2	18.2	34.7
Give food more frequently when a child is recovering from an illness.	266	83.1	I assume instant infant food is sufficient for the children during the day.	0.6	12.2	17.2	63.3	6.6	I give expressed breast milk according to the infant's demand.	39.5	9.0	21.5	29.9
Interacting with children during mealtimes can encourage them to eat.	268	83.8	I think the food preparation for the children is tedious.	7.5	21.6	15.7	47.3	7.8	I burp the infant after a breast milk feeding.	13.7	11.8	38.6	35.9
Encourage children to drink plenty of water when they are sick.	284	88.8	I think it is inappropriate for children to have their meals in front of the television.	2.2	22.0	26.4	44.0	5.3	I give plain water after a breast milk feeding.	18.0	19.3	31.5	31.1

to be continued...

... continuation

Knowledge statements (n=360)	*n*	*%*	*Attitude statements (n=360)*	*Percentage (%)*					*Practice statements*	*Percentage (%)*			
				SD	*D*	*N*	*A*	*SA*		*N*	*S*	*O*	*A*
Eating while watching television helps children to eat.	153	47.8	I think vegetables are not suitable for children.	33.3	45.0	5.7	14.8	1.3	**If using milk formula, handling and cleaning of milk bottle (n_{total}=196)**				
Providing plain water after each breast-feeding session is encouraged.	44	13.8							I sterilise the milk bottle before use	23.2	4.0	22.2	50.5
A soft diet should be continued for infants aged 12 months and older.	22	6.9							I keep sterilised milk bottles in a closed container	22.7	6.6	21.7	49.0
At the age of 1 year, the food needs to be mashed.	52	16.3							I wash the milk bottles using a sponge and soap.	21.9	5.0	20.9	52.2
Tea/coffee can be given to children.	262	81.9							**Complementary feeding (n_{total}=196)**				
									I continue to breastfeed my baby.	28.4	2.9	17.4	51.3
									I gave my baby his/her first solid/semi-solid food at 6 months.	26.5	4.4	27.8	41.3
									I gave my baby his/her first liquid at 6 months.	41.3	4.8	21.3	32.7
									I give vitamin A-rich foods to my baby.	21.5	29.7	23.7	25.2
									I give iron-rich foods to my baby.	30.1	24.4	21.5	24.1

SD: Strongly disagree; D: Disagree; N: Neutral; A: Agree; SA: Strongly Agree; N: Never, S: Seldom, O: Often, A: Always

Study sites

This study was conducted in the newly established autonomous region in the Philippines, known as the BARMM. This region is decentralised, meaning the local government units (LGUs) have the authority to impose taxes, enact legislation, and deliver services such as health and nutrition (Mbuya *et al.*, 2022). The BARMM is the poorest of the country's 17 regions, with a poverty rate of 29.9% as of 2021, alongside high levels of infant and maternal mortalities and shortened life expectancies (BARMM official website, 2021). According to the 2015 National Nutrition Survey, stunting affected 45.2% of children under five. Additionally, the prevalence of wasting in BARMM was significant, recorded at 8.2% for children under five (DOST-FNRI, 2015). The study was conducted in two Food and Agriculture Organization of the United Nations (UN-FAO) project municipalities in the Philippines, selected based on low COVID-19 cases, available local enumerators, LGU approval, a list of children aged 6–23 months, and reliable communication networks.

Data collection

The questionnaire was adapted from various sources, including works by the World Health Organization (WHO, 2021; WHO, 2009) and the Pan American Health Organization (PAHO) and the United Nations Children's Fund (UNICEF) (PAHO & UNICEF, 2013). It comprised sections on socio-demographic and economic characteristics, 20 knowledge statements, 16 attitude statements, and 22 practice statements related to infant and young child feeding. These sections covered topics such as breastfeeding, complementary feeding, meal preparation for children, hygiene and sanitation, responsive feeding, and formula feeding. The questionnaire was translated into local dialects and pre-tested among mothers with similar characteristics to ensure appropriateness and clarity.

To ensure consistency in data collection, the research team underwent training on the questionnaire and data collection procedures. Data were collected through face-to-face interviews, conducted by nine trained enumerators using a pre-tested questionnaire to ensure respondents understood the questions. Safety measures to prevent COVID-19 infections were strictly adhered to throughout the data-gathering process. Additionally, insights from religious leaders were sought to complement health and nutrition promotion strategies. Leveraging their support and Qur'anic teachings has been recognised as a culturally acceptable approach to influence health behaviours and promote positive nutrition practices (Sultani & Ferdous, 2022). Religious leaders have also played a role in supporting health programme implementations, including efforts to encourage behavioural changes at the community level, such as vaccine acceptance (Lohiniva *et al.*, 2022).

Data analysis

Data were cleaned and checked for outliers before analysis. Frequency of distribution was determined to reveal data characteristics. For qualitative variables with a dichotomous outcome, the Fisher's Exact test was performed to test for significant differences in proportions of attributes of interest between the two municipalities. On the other hand, the Fisher-Freeman-Halton test was considered for qualitative variables with more than two possible categories. The level of statistical significance was set at 5%.

For quantitative data, appropriate summary statistics were performed based on whether the data followed a normal distribution or not. The normality of data was tested by the Kolmogorov-Smirnov test. Furthermore, *t*-test was applied to test the difference between two independent variables that were normally distributed, while Mann-

Whitney *U*-test was employed to compare the medians of variables that were not normally distributed or data that were ordinal in nature.

The level of knowledge was assessed using Bloom's cut-off with a percent score of <60, 60-79, and 80-100 indicating poor, moderate, and good knowledge, respectively, as used in previous studies (Labana *et al.*, 2024). Similarly, the same methodology and cut-offs were used to classify a respondent's attitude as negative, neutral, or positive and their practice as poor, fair, or good, respectively. The overall assessment of KAP was determined by calculating the average score of these three components in KAP. The respondents were classified as having poor, satisfactory, or good KAP based on the same methodology and cut-offs. Mann-Whitney *U*-test was applied to statistically compare the levels of KAP between mothers. Furthermore, Spearman's rank-order correlation coefficient was computed to determine the degree of association in the level of KAP with household income and mothers' educational attainment. All statistical analyses were performed using Jamovi version 2.5, a free and open statistical platform by an internationally developed open-source project, Sydney, Australia.

Ethical issues

The study protocol was approved by the Research Institute for Health Sciences - Ethics Review Committee of the University of East Ramon Magsaysay Memorial Medical Center (RIHS ERC Code: 1045/E/2021/126). A written informed consent was obtained from all respondents. The content of the form was explained verbally before requesting the participant to sign the form. Only the encoders and researchers knew about the personal data of the respondents.

RESULTS

Profile of respondents

Majority of respondents were married females (99.4%) with educational attainment at elementary and high school levels, while few reached college degrees (6.6%). Most of the respondents were housewives (82.8%), indicating that a significant portion of the sample were not formally employed. There were also respondents working as community health workers, government employees (1.3%), students (1.6%), and teachers (0.6%).

The median age of mothers was 28.0 years, with the youngest being 18.0 years old. The difference in age based on the Mann-Whitney *U*-test result was not statistically significant (p=0.074). The median household size was 5.0, with a non-normal distribution indicated by p=0.002 from the normality test. Mothers in Datu Anggal Midtimbang (DAM) had a significantly bigger household size than those of Datu Paglas (DAP) (p=0.034).

Majority of mothers in both municipalities earned Php 3,500 per month (US$ 62.50; US$ 1 = Php 56.00). DAM mothers had a median monthly income of Php 1,500 higher than DAP mothers (Php 3,000.00). The Mann-Whitney *U*-test results showed a statistically significant difference in monthly income between DAM and DAP (p=0.004).

Knowledge on IYCF

Over 90.0% of the mothers in both municipalities had good knowledge of breastfeeding practices, understanding the importance of breastfeeding during illness (92.2%) and the correct position during breastfeeding (92.5%). They were also aware that breast milk alone is insufficient to meet an infant's nutritional needs after 6 months (60.9%). Moreover, majority of mothers (88.8%) recognised

the importance of encouraging children to drink plenty of water when they are sick. In addition, many mothers were knowledgeable about giving fruits to a 7-month-old infant (78.1%), increasing food frequency during illness recovery (83.1%), interacting with children during mealtimes to encourage them to eat (83.8%), and introducing family food to a 9-month-old infant (20.3%).

However, some mothers misunderstood certain information about IYCF. These included misconceptions about giving water during the exclusive breastfeeding period (24.4%), giving soft diets for children aged 12 months and older instead of mashed food at one year (16.3%), and offering plain water after each breastfeeding session (13.8%). Others believed that tea and coffee should be given to young children (81.9%), that colostrum can cause difficulty in defecation (50.0%), and that watching television helps children eat (47.8%).

Half of the mothers (50.3%) believed that complementary feeding can be started at four months of age, indicating some variation in knowledge about the appropriate timing for introducing complementary food. In addition, 37.5% of mothers believed that when breast milk looks diluted, it is less nutritious, indicating some misunderstanding about the appearance of breast milk. In summary, the results highlighted certain gaps in knowledge, particularly around the appropriate age for introducing complementary food and some misconceptions about feeding practices.

Attitudes on IYCF

Almost all mothers agreed on the importance of breast milk to an infant's health (99.4%), its economic benefits (96.9%), the emotional bonding it fosters (96.8%), and its continuation alongside complementary food (93.1%). Regarding complementary feeding, the majority expressed enjoyment in meal preparation (92.5%), increasing meal frequency based on the child's age (90.3%), giving frequent meals when the child is sick (89.3%), introducing complementary food at an appropriate age (88.1%), and the importance of interacting with the child during feeding (87.4%). However, there are areas where attitudes should be improved. These include giving a variety of foods to children (13.1%), considering vegetables suitable for children (21.8%), perceiving food preparation as tedious (55.1%), and allowing children to eat in front of the television (49.3%). Additionally, some mothers expressed neutrality and discomfort regarding the utilisation of instant infant food (19.5%).

Practices on IYCF

Most mothers showed positive practices in handwashing and keeping cooking utensils clean, ensuring their children wash their hands before eating (66.7%) and maintaining the cleanliness of eating utensils (66.1%). However, only a minority promptly consume cooked food (33.6%), while some seldom (11.3%) or never do. Many mothers frequently or always engaged with their children during meals (87.2%), allowed them to finish food (91.7%), and refrained from scolding if children refused to eat (58.9%).

Approximately 60.0% of mothers always washed hands with soap before feeding milk to their baby and 59.4% gave expressed breast milk at an appropriate temperature. Furthermore, 43.2% gave expressed breast milk within an hour of thawing and 34.7% always discarded the remaining milk, indicating a positive hygiene practice during feeding. However, only 29.9% always gave milk according to the infant's demand, which involves adjusting feeding schedules and quantities in response to the baby's needs instead of following a rigid schedule. Moreover, only around 40.0% gave plain water after feeding (31.1%) or burped their infants after breastfeeding (35.9%).

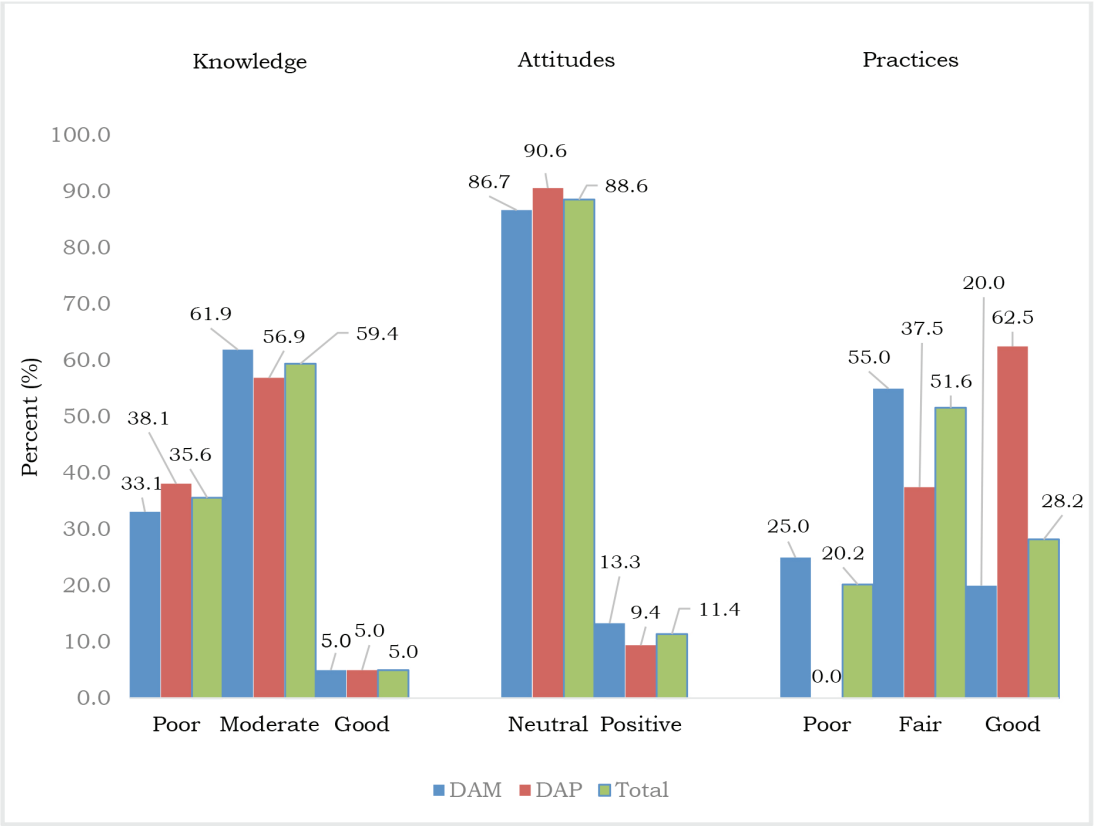

Figure 1. Percentage distribution of mothers by their levels of knowledge, attitudes, and practices on infant and young child feeding in Maguindanao, BARMM, Philippines
DAM - Datu Anggal Midtimbang; DAP - Datu Paglas

About half of the mothers practised sterilising milk bottles before use (50.5%), stored sterilised bottles in closed containers (49.0%), and washed bottles with a sponge and soap (52.2%). In addition, majority of mothers continued breastfeeding (51.3%), with 41.3% introducing solid or semi-solid food and first liquid at six months (32.7%). There was a low percentage of mothers providing vitamin A-rich foods (25.2%) and iron-rich foods (24.1%), indicating inconsistency in nutritional practices among the surveyed mothers.

Overall KAP

Figure 1 showed that about 60.0% of all mothers had moderate IYCF knowledge, with DAM showing a slightly higher percentage (61.9%) compared to DAP (56.9%). The percentage of mothers with good knowledge was only 5.0%, while less than 40.0% had poor knowledge. The Mann-Whitney *U*-test indicated no significant difference in knowledge levels between DAM and DAP mothers (p=0.395). Regarding attitudes, less than 15.0% of mothers in both areas had positive attitudes towards IYCF, with DAM mothers slightly higher at 13.3% compared to DAP mothers at 9.4%, but this difference was not statistically significant (p=0.208). Only 28.0% of mothers exhibited good practices, with DAP mothers having significantly better practice scores compared to DAM mothers (62.5% versus 20.0%, p=0.001). While knowledge levels were

Table 2. Summary of results on the measures of association between educational attainment and income with knowledge, attitudes, and practices, and overall knowledge, attitude and practice among mothers in Maguindanao, BARMM, Philippines

Factor	*Knowledge*		*Attitude*		*Practice*		*Overall KAP*	
	r	*p-value*	*r*	*p-value*	*r*	*p-value*	*r*	*p-value*
Educational attainment	0.106	0.058	0.185	0.001*	0.152	0.091	0.187	0.001*
Income	0.049	0.388	0.106	0.061	0.074	0.419	0.075	0.188

Spearman's rank-order correlation coefficient test was used to measure association
*p<0.05

similar between DAM and DAP, there is a need for targeted interventions and nutrition education to improve IYCF practices among mothers. The findings also emphasised the importance of addressing attitudes to enhance the overall IYCF outcomes.

Based on the test of association between knowledge, attitudes, and practices with educational attainment (Table 2), there was no significant association between education and knowledge (p=0.058), a significant positive association with attitude (p=0.001), and a positive but non-significant association with practice (p=0.091). Income levels showed weak and non-significant associations with knowledge (p=0.388), attitude (p=0.061), and practice (p=0.419). Overall, the data suggested that educational attainment had a more pronounced association with attitude compared to knowledge and practice. Notably, income levels did not exhibit a significant association with any of the three factors.

DISCUSSION

This study analysed mothers' knowledge, attitudes, and practices on IYCF in Maguindanao, BARMM. In a similar study by Yeasmin & Mandal (2020), there were limited data on IYCF in the rural community. Results revealed that about 60.0% of mothers had moderate IYCF knowledge. Common misconceptions included the timing of water introduction during exclusive breastfeeding, appropriate age to start giving complementary food, avoiding feeding children while watching television, and continuing to offer soft diets to children 12 months or older. Addressing these knowledge gaps through social behavioural change interventions in BARMM is imperative. Implementing strategies to improve IYCF practices is important for improving child health and developmental outcomes, particularly in poorly resourced communities (Hackett *et al.*, 2015; Martinez *et al.*, 2018).

The percentage of mothers with good knowledge was significantly lower compared to Western Ethiopian mothers, who had a rate of 93.8% (Assefa *et al.*, 2021). Other studies also indicated low levels of IYCF knowledge in Bahir Dar, Ethiopia (Demilew, 2017) and Accra, Ghana (Gyampoh *et al.*, 2014), highlighting the importance of knowledge in driving improved IYCF practices.

Prevailing suboptimal feeding practices among mothers are detrimental to newborns and young children. Several studies indicated suboptimal IYCF practices among mothers. Mothers in Afghanistan had very poor knowledge, attitudes, and practices regarding nutrition care and cooking practices (Sultani & Ferdous, 2022). In Manipur, India, mothers initiated complementary feeding before their child reached six months of age and 71.0% used commercial infant

formula (Singh *et al.*, 2014). Similarly, in Central Kerala, India, many mothers began complementary feeding before the child reached four months old (Manghat & Thulaseedharan, 2018). Therefore, integrating optimal IYCF practices during routine nutrition education and counselling sessions is important.

Additionally, a significant percentage of mothers in BARMM had 'neutral' attitudes towards IYCF practices (88.6%). This is notably different from the positive attitudes observed among 94.0% of Ghanaian mothers (Bimpong *et al.*, 2020). Diverse responses were noted, including concerns about the necessity of offering a variety of foods to children, the tediousness of food preparation, feeding while watching television, and reservations about utilising ready-made infant foods. These findings underscore the need for tailored-fit intervention strategies to address prevailing misconceptions. The observed 'neutral' attitudes among mothers in BARMM may contribute to the continuation of suboptimal IYCF practices. Thus, empowering women to transform their attitudes from 'neutral' to 'positive' should be addressed to promote better IYCF practices.

Overall, approximately 60.0% of mothers had moderate knowledge, 88.6% had a neutral attitude, and 28.2% had good IYCF practices. Mothers need both knowledge and attitude to enhance their IYCF practices (Assefa *et al.*, 2021). But having knowledge or attitude alone may not always result in good practices. For example, in a Tanzanian study, despite mothers' awareness of the proper timing for initiating complementary feeding, the majority still introduced semi-solid food and liquids before six months (Sichalwe *et al.*, 2023).

At a 5% level of significance, educational attainment had a significant relationship with both attitude (r=0.185, p=0.001) and overall KAP (r=0.187, p=0.001). However, its correlations with knowledge (r=0.106, p=0.058) and practice (r=0.152, p=0.091) were not statistically significant, as their p-values exceeded the 0.05 threshold. These findings are in contrast with Demilew's study (2017), where education was among the factors correlating with mothers' knowledge. This indicates that while higher education may foster a more favourable attitude and contribute to overall KAP, it does not necessarily translate to higher knowledge levels or improved practices. In addition, although employment is correlated with a higher likelihood of feeding children according to IYCF guidelines (Oddo & Ickes, 2018), income in this study did not correlate with KAP. This can be due to a variety of factors, including differing food tastes, food availability and accessibility, and time spent on feeding the child.

This study focused on a specific cultural and religious setting, which limits generalisability of the findings to other groups. While comparisons between Muslim and non-Muslim mothers were not explored, future research could examine potential differences to provide broader insights into IYCF practices across diverse populations. Previous studies have highlighted cultural influences on IYCF practices, including perspectives drawn from religious texts such as the Holy Qur'an and the Hadith (Shaikh & Ahmed, 2006; Zaidi, 2014; Bensaid, 2021). In some contexts, breastfeeding is viewed as both a moral and practical responsibility (Bensaid, 2021). Adepoju's study (2019) also found that respondents often preferred guidance from religious leaders alongside advice from health professionals. Another limitation of this study is its cross-sectional study design, which limits the ability to establish causality. Despite this limitation, the findings provided valuable insights into IYCF practices in BARMM.

CONCLUSION

In this study, it was found that about 60.0% of mothers had moderate knowledge about infant and young child feeding, with 11.4% exhibiting positive attitudes and 28.2% showing good practices. This study found a positive association between education and attitude with overall KAP, while income showed no significant associations with knowledge, attitude, and practice. Despite the study's limitations, the findings offered valuable insights into IYCF practices among mothers in the BARMM region. This study suggests opportunities for targeted interventions among mothers, emphasising the importance of enhancing knowledge, transforming attitudes, and improving practices to optimise IYCF outcomes. Recommendations include conducting counselling during home visits, at health centres, or online, considering mobility and transportation restrictions. Exploring social media promotion of IYCF messages and involving religious leaders in training courses are also suggested to enhance behavioural changes among the target population.

Acknowledgement

The authors wish to acknowledge the respondents, local officials, and community nutrition and health workers who participated in the study.

Authors' contributions

Talavera MTM and Bustos AR, principal investigator and co-principal investigator, conceptualised and designed the study, prepared the draft of the manuscript, and reviewed and finalised the manuscript; Domingo DGC, Felix ADR, Africa LS, Orillo AT, participated in data collection, assisted in the data analysis and interpretation, and reviewed the manuscript; Tandang NA, Lee WT and Pastores MCF, participated in the data analysis and reviewed the manuscript.

Conflict of interest

All authors declare no conflict of interest.

References

Adepoju OT, Adesemoye ET, & Akinyele IO (2019). Role of religion on knowledge, attitude and practices of lactating mothers on infant feeding. *Int J Nutr* 4(2):14-25.

Assefa DG, Woldesenbet TT, Molla W, Zeleke ED, & Simie TG (2021). Assessment of knowledge, attitude, and practice of mothers/caregivers on infant and young child feeding in Assosa Woreda, Assosa Zone, Benshangul Gumuz Region, Western Ethiopia: a cross-sectional study. *Arch Public Health* 79:170.

BARMM official website (2021). *In: BARMM's poverty incidence drops in 2021*. From https://bpda.bangsamoro.gov.ph/ [Retrieved July 25 2024].

Bensaid B (2021). Breastfeeding as a Fundamental Islamic Human Right. *J Relig Health* 60(1):362-373.

Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, Webb P, Lartey A, Black, RE & Lancet Nutrition Interventions Review Group, the Maternal and Child Nutrition Study Group (2013). Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet (London, England)* 382(9890):452–477. https://doi.org/10.1016/S0140-6736(13)60996-4

Bimpong KA, Cheyuo EKE, Abdul-Mumin A, Ayanore MA, Kubuga CK & Mogre V (2020). Mothers' knowledge and attitudes regarding child feeding recommendations, complementary feeding practices, and determinants of adequate diet. *BMC Nutr* 6(1):67.

de Onis M & Branca F (2016). Childhood stunting: a global perspective. *Matern Child Nutr* 12 Suppl 1(Suppl 1):12-26.

Demilew YM (2017). Factors associated with mothers' knowledge on infant and young child feeding recommendation in slum areas of Bahir Dar City, Ethiopia: cross-sectional study. *BMC Res Notes* 10(1):191.

DOH (2019). Department Circular 2019-0537 Circulation of the Philippine Infant and Young Child Feeding (IYCF) 2019 to 2030 (#IYCF2030) Strategic Plan.

DOST-FNRI (2021). Expanded National Nutrition Survey (ENNS). Department of Science and Technology-Food and Nutrition Research Institute, Metro Manila, Philippines.

DOST-FNRI (2013). Philippine Nutrition Facts and Figures 2013: 8th National Nutrition Survey Overview. Department of Science and Technology-Food and Nutrition Research Institute, Metro Manila, Philippines.

DOST-FNRI (2015). The double burden of malnutrition in the Philippines: 2016 regional dissemination forum. Updating of the nutritional status of Filipino children and other population groups. From https://www.fnri.dost.gov.ph/images/sources/Dissemination/ARMM.pdf [Retrieved March 9, 2025].

DOST-FNRI (2022). Philippine Nutrition Facts and Figures: 2018-2019 Expanded National Nutrition Survey (ENNS). Department of Science and Technology-Food and Nutrition Research Institute, Metro Manila, Philippines.

Gyampoh S, Otoo GE & Aryeetey RN (2014). Child feeding knowledge and practices among women participating in growth monitoring and promotion in Accra, Ghana. *BMC Pregnancy Childbirth* 14(1):180.

Hackett KM, Mukta US, Jalal CS & Sellen DW (2015). Knowledge, attitudes, and perceptions on infant and young child nutrition and feeding among adolescent girls and young mothers in rural Bangladesh. *Matern Child Nutr* 11(2):173-189.

Labana RV, Dolar MVJr, Ferrer EJJ & Roel JC (2024). The awareness-to-agreement-to-adherence model of food safety compliance: The case of street food consumers in Manila city, Philippines. *J Public Health Emerg* 8:13.

Lohiniva AL, Nurzhynska A, Alhassan H, Shetye M & Ayiku P (2022). Understanding factors influencing polio vaccine uptake in Ghana—Developing meaningful community mobilization and engagement strategies in collaboration with religious leaders. *Am J Trop Med Hyg* 107(6):1345-1350.

Manghat S & Thulaseedharan JV (2018). Feeding practices during the first 6 months of infancy - Observations from a community-based cross-sectional survey in Central Kerala, India. *Int J Med Sci Public Health* 7(6):434-439.

Martinez S, Johannsen J, Gertner G, Franco J, Exposito ABP, Bartolini RM, Condori I, Ayllon JF, Llanque R, Alvarado N, Lunstedt C, Ferrufino C, Reinaga T, Chumacero M, Foronda C, Albarracin S & Agular AM (2018). Effects of a home-based participatory play intervention on infant and young child nutrition: a randomised evaluation among low-income households in El Alto, Bolivia. *BMJ Glob Health* 3(3):e000687.

Mbuya NVN, Demombynes G, Piza SFA & Adona AJV (2022). *Undernutrition in the Philippines: Scale, Scope, and Opportunities for Nutrition Policy and Programming. International Development in Focus.* World Bank, Washington, DC.

Oddo VM & Ickes SB (2018). Maternal employment in low- and middle-income countries is associated with improved infant and young child feeding. *Am J Clin Nutr* 107(3):335-344.

PAHO & UNICEF (2013). ProPAN: Process for the Promotion of Child Feeding. Software User's Guide Version 2.0. PAHO, Washington, DC.

Shaikh U & Ahmed O. (2006). Islam and infant feeding. *Breastfeed Med* 1(3):164-167.

Sichalwe MM, Behera MR, Behera D, Dehury RK & Degge H (2023). Knowledge and practice of complementary feeding among mothers in Dar-es-Salaam, Tanzania: Community-based cross-sectional study. *Clin Epidemiol Glob Health* 24:101430

Singh KB, Minita N, Shyami M, Priscilla K & Avinash K (2014). Child-feeding practices in a sub-urban Muslim Community in Manipur: A cross-sectional study. *J Evol Med Dent Sci* 3(30):8495-8499.

Sultani N & Ferdous T (2022). *In: Nutrition in Qur'an: An innovative approach to promote optimal nutrition care practices.* Field Exchange. From www.ennonline.net/fex/nutritioninquran [Retrieved July 15 2024].

World Food Program (2023). Case Study: A self-reliant and resilient Bangsamoro From https://docs.wfp.org/api/documents/WFP-0000148145/download/?_ga=2.113775044.2136311250.1721021333-1053570593.1721021333 [Retrieved July 15 2024].

WHO (2021). Infant and young child feeding counseling: an integrated course. Trainer's guide, second edition. World Health Organization, Geneva.

WHO (2009). Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. World Health Organization, Geneva.

Yeasmin N & Mandal NK (2020). Infant feeding practices in a rural Muslim community in Malda district of West Bengal. *J Comp Health* 8(2):84-89.

Zaidi F (2014). Challenges and practices in infant feeding in Islam. *Br J Midwifery* 22(3):167-172.