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Original Research

Caregivers' knowledge, attitude, and practices on complementary feeding of young children aged 6-23 months in Naga City, Philippines

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Abstract

A cross-sectional study was conducted to investigate the knowledge, attitudes, and practices of 60 caregivers regarding complementary feeding and its impact on the nutritional status of their children aged 6–23 months in Panicuason, Naga City, Philippines. Face-to-face interviews were conducted to collect data using pre-designed and pre-tested questionnaires. Descriptive statistics and Pearson's R Correlation tests were used to analyze the data at $p < 0.05$. The results indicated that the households involved had poor conditions in terms of educational attainment, occupation, and household income of the caregivers. The prevalence rates revealed a medium level of underweight (10.0%) and stunting (23.4%), and a poor level of wasting (5.0%). The KAP results demonstrated medium knowledge, positive attitudes, and poor practices among the caregivers. Several KAP components were significantly associated with socioeconomic factors and water sanitation practices. The study found a weak positive correlation between weight-for-age and employment and a weak negative correlation between height-for-age and caregiver-child relationship. This study highlights the urgent need for nutrition education interventions focused on complementary feeding to improve the knowledge and practices of the caregivers. Such interventions are essential for enhancing child nutrition outcomes and potentially influencing positive changes in the attitudes of the caregivers.

Keywords— caregivers, complementary feeding, children, KAP

1 Introduction

Breastfed infants face increasing challenges in meeting all necessary nutrients from human milk beyond six months. As children grow older, their energy, iron, and vitamin A requirements exceed the amounts provided by breastfeeding alone [1]. Complementary foods have been introduced to bridge this gap to provide additional energy and nutrients for growth and development. From 6 to 23 months, this period is crucial to children's first 1,000 days of life [2]. Improper introduction of complementary foods can result in deficiencies in energy, protein, iron, and vitamin A, leading to undernutrition and failure to thrive, characterized by inadequate weight gain [3]. Therefore, this phase represents an opportunity to reduce stunting, wasting, overweight, and obesity while promoting long-term development and health [4].

The Southeast Asia Regional Report on Maternal Nutrition and Complementary Feeding indicates that, despite concerted efforts in the Philippines focused on Infant and Young Child Feeding (IYCF), inadequate maternal nutrition and suboptimal feeding practices persist in the country. In 2021, 21% of Philippines households could not access affordable and nutritious food. Furthermore, knowledge and behavioral issues affect food choices, and even the wealthiest children in the Philippines have been found to have insufficient dietary diversity [5]. As a result, the prevalence of undernutrition in the Philippines has not improved over the past three decades [6]. Addressing this issue requires tackling underlying causes such as inadequate caregiving and feeding practices [7].

In compliance with the "Kalusugan at Nutrisyon ng Mag-Nanay Act (Rep. Act No. 11148) [8], the Naga Local Government Unit (LGU) established the first 1000-day program for children to provide evidence-based nutrition interventions and actions that integrate responsive caregiving and early stimulation in a safe environment [9]. However, despite these efforts, Brgy. Panicuason in Naga City has shown a notable prevalence of stunted and severely stunted children, in contrast to the lower rates of undernutrition observed in other barangays within the city [9].

This study aimed to determine caregivers' knowledge, attitudes, and practices (KAP) on complementary feeding for children 6-23 months in Barangay Panicuason, Naga City. Specifically, it examined the socioeconomic and demographic characteristics of the caregivers, their water sanitation practices, and the nutritional status of their children. This study also assessed the relationship between these characteristics and KAP and the correlation between KAP scores and nutritional status. Furthermore, it analyzed the association between knowledge, attitudes, and practices of the caregivers. The findings of this study provide valuable information for caregivers to review and enhance complementary feeding practices to improve the nutritional status of their children. Additionally, the context-specific data obtained in the study are significant for the Barangay Nutrition Committee (BNC) of Brgy. Panicuason, LGU and community nutritionists of Naga City to develop and enhance evidence-based nutrition interventions related to complementary feeding, aiming to raise awareness among caregivers and reduce the prevalence of stunting in Brgy. Panicuason.

2 Methodology

2.1 Research Design

The study used a cross-sectional research design to collect participant data and assess the correlation between variables. The data encompassed the socioeconomic and demographic characteristics of the caregivers, as well as their KAP regarding complementary feeding.

The study employed pre-designed and pre-tested questionnaires as research instruments (see Supplementary Material [10]). The first part of the questionnaire was based on a household and demographic questionnaire from the 8th National Nutrition Survey (NNS) of the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) [11]. The second part was adapted from the nutrition-related KAP model questionnaires of the Food and Agriculture Organization (FAO) for feeding young children aged 6-23 months [12]. Additionally, a question

on the Minimum Acceptable Diet (MAD) was added as a supplementary indicator for evaluating the feeding practices of the caregivers for their children, which followed the WHO Indicators for Assessing Infant and Young Child Feeding Practices [13, 14].

Pre-testing was performed on a sample of five caregivers of Brgy. Concepcion Pequeña, Naga City, who had children aged 6-23 months old through phone call interviews. However, this approach has certain limitations when using phone calls as a data collection method. First, participants often resided in areas with poor coverage or weak signal strength, making it difficult to establish communication. Second, many households lack access to mobile devices, which hinders their ability to participate in phone interviews. Finally, these households use mobile phones frequently lack sufficient load or credit to respond to approval and schedule interview sessions. Face-to-face interviews were conducted during the data collection to mitigate these limitations.

2.2 Population of the Study and Sample Size Determination

Coordination with the City Population and Nutrition Office (CPNO) of Naga was done to contact the Barangay Nutrition Scholar (BNS) of the respective barangay. A copy of the most recent Operation Timbang (OPT) Plus was obtained as secondary data from the BNS to identify the number of households with children aged 6-23 months and to determine the children's anthropometric measurements and nutritional status. The study was conducted in Brgy. Panicuason, Naga City, where 60 caregivers of children in the target age group were selected from a total population of 70.

$$\text{sample size} = \frac{\frac{z^2 p(1-p)}{e^2}}{1 + \frac{z^2 p(1-p)}{e^2 N}} \quad (1)$$

The sample size was calculated using the formula in Equation 1, where z = z-score, p = proportion, e = margin of error, and N = population size. The sample size indicated a high proportion (85.7%) of the surveyed population, providing a representative sample. Random sampling was implemented using a list of households provided by the BNS, with participants selected based on alphabetically arranged surnames using a random number generator.

2.3 Data Collection

Data were collected through face-to-face interviews, ensuring informed consent and anonymity using assigned respondent codes. The interviews were conducted over five days, spanning two weeks, contingent upon the availability of members from the Barangay Nutrition Committee (BNC) who assisted in locating and engaging participants.

2.4 Data Management, Processing and Analysis

In Microsoft Excel, quantitative data were analyzed using descriptive statistics (i.e., mean, frequency, and percentage distribution). The KAP assessment was conducted using a point system based on IYCF recommendations, with appropriate responses receiving the corresponding points. The KAP scores were then categorized and assessed based on Bloom's cut-off points [15]. The mean scores for the KAP were classified according to the suggested threshold levels, which indicated the need for nutrition education intervention, according to the Food and Agriculture Organization (FAO) [12]. Anthropometric data collected from Operation Timbang Plus (OPT Plus) were analyzed using the WHO Anthro Software Analyzer. The prevalence of undernutrition was determined based on cut-off values established by de Onis et al. [16], assessing its public health significance.

Pearson's R Correlation tests using the Statistical Package for Social Sciences (SPSS) version 26 were conducted at $p < 0.05$ to assess the relationship among variables. The correlation strength was analyzed using the cut-off points for the correlation coefficient [17].

2.5 Ethical Considerations

Informed consent forms written in the local language were provided to caregivers and BNC members. During the initial contact, the researcher obtained their informed consent by explaining the contents of the study and addressing any questions that arose. A copy of the informed consent form was provided to each participant for reference purposes. As part of the informed consent process, key details such as the relevance of the study, criteria for participation, voluntary nature of involvement, anticipated duration of participation, measures to ensure privacy and confidentiality of records, and the freedom to withdraw from the research at any time were communicated to eligible participants. Participants were then asked to sign an informed consent form, and no coercion was exerted to influence their decision. To preserve the anonymity of the participants, a unique respondent code was assigned to each individual and records linking individuals to specific information were not disclosed. Children of participating caregivers were given snacks as compensation for the time and effort spent during the interview. Health risks were mitigated by maintaining a safe distance from participants and wearing face masks.

The collected data were solely used for the study's intended purpose and were treated with utmost confidentiality. The researcher ensured the relevance of the study to the community by consulting with the City Population and Nutrition Office of Naga and referencing local public health records.

3 Results and Discussion

3.1 Socioeconomic and Demographic Characteristics and Water Sanitation Practices

Table 1 shows the socioeconomic and demographic characteristics of the caregivers. Results revealed that the majority of the caregivers were female (96.7%) and parents (mother/father) of the children (96.7%). Most of their age ranged from 20-49 years old (93.3%), while 6.7% were adolescents ranging from 17-19 years old. Educational attainment varied, with a significant portion having only completed high school or less, leading to a high percentage of participants with no occupation (73.3%).

Table 1. Socioeconomic and demographic characteristics of caregivers with children 6-23 months old in Brgy. Panicuason, Naga City

SEX	RELATIONSHIP	AGE	EDUCATIONAL ATTAINMENT	EMPLOYMENT STATUS	MONTHLY HOUSEHOLD INCOME	HOUSEHOLD SIZE	MAIN SOURCE OF DRINKING WATER	WATER SAFETY	MAIN SOURCE OF WATER (FOR COOKING AND WASHING HANDS)
Male, 3.3%	Mother/Father, 96.7%	17-19 6.7%	Elementary 15.0%, Undergraduate 8.3%	Clerical support workers 3.3%, Service workers and shop and market sales workers 10.0%, Farmers, forestry workers, and fishermen 5.0%, Elementary Occupation: Laborers & Unskilled workers 1.7%, No occupation 73.3%, Student 6.7%	≤Php 12,000 78.3%, >Php 12,000 21.7%	≤ 3: 11.7%, 4-5: 53.3%, 6-7: 23.3%, 8-9: 11.7%	Piped into dwelling, 40.0%, Piped to yard/plot, 16.7%, Public tap/standpipe, 36.7%, Protected spring, 6.7%	Yes 35.0%, No 41.7%, Others: bottled water 23.3%, If yes, Boil. 96.0%, Let it stand/settl e4.0%	Piped into dwelling 53.3%, Piped to yard/plot 15.0%, Public tap/standpipe 23.3%, Protected spring 8.3%
Female, 96.7%	Grandmother/Grandfather, 3.3%	20-49 93.3%	Elementary 8.3%, High school undergraduate 11.7%, High school graduate 36.7%, ALS Graduate 8.3%, College undergraduate 13.3%, College graduate 5.0%, No grade completed 1.7%						

Consequently, a substantial portion of households fell below the poverty threshold (78.3%) [18], despite having a household size of 4-5 (53.3%), which is considered average [19]. While generally acceptable, this household size may impact food security given the low household income. According to Fusco and Isla [20], the effect of poverty increases as the household size increases. These findings are similar to those observed in another study that emphasized the link between education, occupation, and income [21]. Moreover, more than half (58.3%) of the caregivers used safe water sources, which can positively influence child nutrition [22]. This aligns with the study by Saaka, Saapiire and Dogoli [23], indicating the importance of safe water and adequate complementary feeding on the nutritional status of children.

3.2 Nutritional Status of the Children

Table 2 shows the nutritional status of children aged 6-23 months old. The results revealed that the majority (90.0%) of children were within normal weight for-age (WFA), with 10.0% classified as underweight or severely underweight. In terms of height-for-age (HFA), 75.0% of children were normal, 1.7% were tall, and 11.7% were stunted or severely stunted. Furthermore, 95.0% of the children were normal, 3.3% were wasted, and 1.7% were severely wasted. These findings suggest a medium prevalence of underweight (10.0%) and stunting (23.4%), and a poor prevalence of wasting (5.0%) according to the classifications of public health significance.

Table 2. Nutritional status of the caregivers' children 6-23 months old in Brgy. Panicason, Naga City

NUTRITIONAL STATUS	Respondents (n=60)	
	Frequency	Percentage
Weight for Age		
Normal	54	90.0
Overweight	0	0
Underweight	3	5.0
Severely Underweight	3	5.0
Height for Age		
Normal	45	75.0
Tall	1	1.7
Stunted	7	11.7
Severely Stunted	7	11.7
Weight for Height/Length		
Normal	57	95.0
Overweight	0	0
Obese	0	0
Wasted	2	3.3
Severely Wasted	1	1.7

The prevalence of undernourished children in Brgy. Panicason was lower than the national average based on the 2018-2019 Expanded National Nutrition Survey [24], which reported averages of 19.1% underweight, 29.6% stunted, and 5.7% wasted, respectively. However, stunting was more prevalent in Brgy. Panicason compared to other barangays in Naga City, accounted for 17.87% of the population, followed by Brgy. Calauag (5.99%) and Brgy. Sabang (4.21%) [9]. Siddiq et al. [25] revealed that maternal education positively impacted child health. Meanwhile, Watson et al. [26] recommended integrating behavioral change strategies into nutrition interventions to enhance outcomes for both mothers and children.

3.3 Knowledge, Attitudes and Practices (KAP) of the Caregivers on Infant and Young Child Feeding

Table 3 presents the caregivers' knowledge, attitudes and practices regarding complementary feeding practices. The results revealed that most (65.0%) of caregivers understood the crucial initiation of breastfeeding within the first hour of childbirth. However, misconceptions persisted, such as waiting until the baby cries or delaying breastfeeding by an hour. The awareness of colostrum is high at 60.0%, with 88.9% of the caregivers identifying it correctly as the milk produced post-childbirth. Knowledge of exclusive breastfeeding up to six months was noted among 58.3% of caregivers, yet 60.0% of them believed complementary foods should start at six months. This suggests a potential gap in caregiver knowledge regarding the appropriate time frame for complementary feeding, similar to a study on IYCF [27]. The reasons for introducing complementary foods included perceptions that breastmilk alone becomes insufficient (38.3%) or due to the expressed interest of the children (40.0%). While a significant majority (70.0%) of caregivers correctly answered that breastfeeding could continue beyond 24 months, there was occasional confusion, such as the notion that the preference of the children should dictate breastfeeding. In terms of food consistency, responses indicated that the problem is that the figures do not match. Both statements are correct, but the proportion of caregivers agreeing with each statement is unequal. A mixed understanding: 46.7% accurately said porridge should be thick, while an equivalent percentage erroneously said it should be thin. Most participants demonstrate proficient knowledge of dietary diversity and methods to enhance the nutritional content of porridge (95.0%), such as incorporating Vitamin A-rich foods.

Table 3. Summary of the KAP Scores and their classification according to Bloom's Cut-off Points

CATEGORY	MEAN SCORE (%)	SD*	BLOOM'S CLASSIFICATION	CUT-OFF (%)	Respondents (n=60)	
					Frequency	Percent
Knowledge	59.7	1.7	High/good	80-100	11	18.3
			Moderate	60-79	25	41.7
			Poor/Low	< 60	24	40.0
Attitudes	82.7	2.0	Positive	80-100	38	63.3
			Neutral	60-79	21	35.0
			Negative	< 60	1	1.7
Practices	82.7	1.6	High/good	80-100	10	16.7
			Fair	60-79	15	25.0
			Poor/low	< 60	35	58.3

*SD- Standard Deviation

Similarly, most caregivers (88.3%) grasp the concept of responsive feeding by focusing on the children's attention. Findings align with the results reported by Bimpong et al. [28], where most caregivers were aware of recommended breastfeeding practices, appropriate age to introduce complementary foods, and strategies for encouraging young children to eat. However, only a small percentage (27.5%) of the caregivers could correctly determine the appropriate consistency for preparing porridge. In a study conducted in Nepal, it was observed that 45.2% of mothers prepared thin-consistency porridge, which was nutritionally insufficient [29]. While caregivers generally demonstrate competency in enriching the diet of the children, significant gaps in knowledge regarding optimal feeding practices remain.

In terms of the attitudes of the caregivers towards complementary feeding, the results revealed that almost all of them (96.7%) perceived immediate breastfeeding after birth as beneficial, and all (100.0%) acknowledged the benefits of colostrum for the infants. Regarding exclusive breastfeeding,

88.3% of the caregivers supported the practice for the first six months, while 3.3% expressed concerns about the infants becoming easily hungry with this practice. However, 25% of the caregivers cited challenges associated with exclusive breastfeeding, such as insufficient supply of breastmilk, busy schedules, and the availability of alternatives like formula. Although the majority (95.0%) of caregivers emphasized the importance of continuing breastfeeding beyond six months, 26.7% encountered difficulties in doing so, such as maternal refusal to breastfeed and subsequent child-births. Despite consensus among caregivers on the benefits of introducing solid foods at six months, with 81.7% demonstrating confidence in their food preparation skills, 30.0% encountered difficulties in providing daily food variety due to financial constraints and limited nutrition knowledge. Approximately 21.7% of the caregivers cited concerns about digestive issues from varied diets.

In comparison, 20.0% reported challenges with feeding multiple times daily due to financial limitations, reluctance of the children to consume large amounts of food, or picky eating habits. Despite generally optimistic attitudes, 78.3% of the caregivers reported incomes below the poverty threshold [18], which could negatively impact their ability to adhere to the recommended feeding guidelines [30]. These findings align with those of Bimpong et al. [28], who identified challenges in providing complementary foods due to a lack of resources and insufficient awareness about nutrition.

The practices of caregivers about breastfeeding and complementary were assessed, revealing that the majority (85.0%) initiated breastfeeding within the first hour after childbirth. This percentage is higher than reported in a related study [31]. Among those who used infant formula (5%), 66.7% fed their children after one hour, while 33.3% waited until the following day. These practices are incorrect and increase the risk of child mortality and diseases, as well as decreased likelihood of continuing breastfeeding [32]. Only 40% of caregivers practiced exclusive breastfeeding for six months, while 18.3% did so for less than six months and 16.7% for more than six months. The remaining 25.0% of caregivers did not breastfeed their children with breastmilk, with 40.0% giving their children infant formula for less than six months, 46.7% for exactly six months, and 13.3% for more than six months. Complementary foods were introduced at six months by 56.7% of the caregivers. However, there was a 16.7% discrepancy between the timing of complementary food introduction and the duration of exclusive breastfeeding. A study by Jain, Thapar, and Gupta found similar results [33], with 36.25% of mothers exclusively breastfeeding their infants for the first six months, while 48.75% of mothers started introducing complementary food between the ages of six and eight months.

In the diet of the children, carbohydrate-rich foods such as porridge and rice make up the majority (95.0%), while sugary foods such as chocolates, candies, and biscuits were consumed at a rate of 73.0%. The consumption rates of protein-rich foods and vitamin A sources vary. Compliance with dietary diversity recommendations was observed in 81.7% of children, indicating adequate nutrient intake. However, challenges in meeting the minimum meal frequency guidelines were evident, particularly among breastfed infants aged 6-8 months (50.0%) and those aged 9-23 months (25.6%). Only 36.7% of the children achieved the Minimum Acceptable Diet (MAD), highlighting the gaps in meeting comprehensive dietary standards despite overall positive practices in breastfeeding initiation and food diversity.

Compared to the 2018-2019 Expanded National Nutrition Survey of the Department of Science and Technology-Food and Nutrition Research Institute in the Philippines [24], the current study's findings based on minimum dietary diversity and minimum acceptable diet were satisfactory. However, a poor outcome was observed regarding minimum meal frequency. Feeding less frequently than advised may negatively affect the total energy and nutrients consumed, leading to growth retardation, stunting, and micronutrient deficiencies [34].

The summarized results of caregiver knowledge, attitudes, and practices in Table 3 show that the majority of the caregivers possessed moderate knowledge (41.7%), positive attitudes (63.3%), and

poor/low practices (58.3%). These findings align with various studies indicating average knowledge, positive attitudes, and sub-optimal feeding practices [21, 25, 35]. Furthermore, the mean score for knowledge, attitudes, and practices were 59.67%, 82.71%, and 60.48%, respectively. Practices showed the least variability from the mean (SD=1.6), followed by knowledge (SD=1.7) and attitudes (SD=2.0). According to the Food and Agriculture Organization (FAO) [13], it is crucial to implement nutrition education interventions (70%) to improve the nutritional knowledge and practices of caregivers related to complementary feeding. Additionally, enhancing attitudes (71-89%) toward complementary feeding among caregivers should be considered. Therefore, it is essential to implement nutrition education interventions to enhance the KAP of the caregivers related to child nutrition.

3.4 Association Between Knowledge, Attitudes, and Practices on Infant and Young Child Feeding of Caregivers

Table 4 shows the association between knowledge, attitudes and practices of the caregivers. The results revealed a significant moderate positive correlation ($p < 0.05$) between the knowledge of the caregivers and their corresponding practices, indicating that higher levels of knowledge were associated with better adherence to complementary feeding practices. This is supported by the research of Saaka, Awini, and Nang [36], which reports that caregivers with higher nutrition-related knowledge scores tend to implement appropriate complementary feeding practices effectively. However, no significant relationship was found between the knowledge of the caregivers and their attitudes, suggesting that increased knowledge does not necessarily lead to positive attitudes. Similarly, there was no significant association between the attitudes of the caregivers and their actual practices, implying that positive attitudes may not consistently result in appropriate feeding practices. These findings can be attributed to challenges faced by caregivers, including concerns about insufficient supply of breastmilk, busy schedules, and the availability of alternatives, such as infant formula. Additionally, problems with complementary feeding provisions, such as budgetary problems and a lack of awareness of proper complementary feeding practices, were cited.

Table 4. Association between the Knowledge, Attitudes, and Practices (KAP) of caregivers with children 6-23 months old in Brgy. Panicuason, Naga City

		KNOWLEDGE	ATTITUDES	PRACTICES
Knowledge	Pearson Correlation	1	0.107	.567
	Sig. (2-tailed)		0.415	0.000*
	N	60	60	60
Attitudes	Pearson Correlation	0.107	1	0.088
	Sig. (2-tailed)	0.415		0.505
	N	60	60	60
Practices	Pearson Correlation	0.567	0.088	1
	Sig. (2-tailed)	0.000*	0.505	
	N	60	60	60

*Significant at p value < 0.05

Bimpong et al. [28] emphasized the issue of low dietary diversity and meal frequencies among children, which is often caused by the inability of caregivers to adhere to feeding recommendations due to financial constraints. A study by Dallman, Marquis, Colecraft, Kanlisi, and Aidam [37] demonstrated that active participation of mothers in nutrition programs is positively associated with better child nutrition outcomes, such as increased egg consumption and improved linear growth. Therefore, active engagement of caregivers in nutrition programs ensures adequate nutrition for their children and improves their overall nutritional status.

3.5 Relationship Between the KAP on Infant and Young Child Feeding and the Nutritional status of Children

Table 5 displays the relationship between KAP on complementary feeding of caregivers and their children’s nutritional status. The results indicated a significant weak positive correlation ($p < 0.05$) between the caregivers’ knowledge and their children’s WFA and HFA, suggesting that higher knowledge correlates with improved WFA and HFA outcomes.

Table 5. Relationship of the Knowledge, Attitudes, and Practices (KAP) of caregivers with the nutritional status of the children 6-23 months old in Brgy. Panicuason, Naga City

		KNOWLEDGE	ATTITUDES	PRACTICES
WFA	Pearson Correlation	0.329	0.039	0.155
	Sig. (2-tailed)	0.010*	0.770	0.236
	N	60	60	60
HFA	Pearson Correlation	0.268	-0.010	-0.086
	Sig. (2-tailed)	0.039*	0.942	0.516
	N	60	60	60
WFH	Pearson Correlation	0.227	0.027	0.180
	Sig. (2-tailed)	0.082	0.841	0.169
	N	60	60	60

*Significant at p value < 0.05

WFA= weight-for-age; HFA= height-for-age; WFH= weight-for-height

These findings are consistent with Kwerengwe and Singh [38], which demonstrated that maternal knowledge of complementary feeding predicted children’s nutritional status, showing a significant positive correlation. Ntuiyo, Tambipi, & Nurkamiden [39] also identified a similar relationship, emphasizing the importance of caregiver knowledge in promoting healthy growth among children. A study by Viajar et al. [40] in the Philippines demonstrated the effectiveness of targeting complementary feeding for children aged six months to 2 years. These interventions involved using locally sourced food and nutrition education, increasing the knowledge scores of the caregivers and improving the WFA of their children. It was found that the success of implementing such intervention at both municipal and barangay levels was heavily dependent on the commitment of implementers to adhere to the planned activities across all phases, including planning, organization, implementation monitoring, and evaluation.

3.6 Relationship between the Socioeconomic and Demographic Characteristics and Water Sanitation Practices with KAP on Infant and Young Child Feeding

Table 6 shows the relationships between the KAP of the caregivers and various socioeconomic and demographic variables. The findings revealed no significant association between these variables.

This outcome aligns with the findings of Nassanga, Okello-Uma, and Ongeng [41], who concluded that sociodemographic factors, including the sex of the household head, age of the caregiver, marital status, employment status, education level of both caregiver and household head, household size, monthly food expenditure, caregiver residence, completion of nutritional training, and the sex, age, and place of birth of the child, did not predict appropriate nutritional practices. Similarly, Pokharel et al. [42] reported no significant association between complementary feeding practices and socioeconomic factors, such as poverty, family type, and educational level.

Table 7 revealed that specific components of KAP demonstrated significant correlations with specific socioeconomic and demographic characteristics and water sanitation practices ($p < 0.05$). Higher educational attainment was associated with increased knowledge of colostrum ($p = 0.07$) and reasons for providing complementary foods ($p = 0.01$). At the same time, younger caregivers demonstrated a better understanding of these reasons than older caregivers ($p = 0.023$). This finding

Table 6. Relationship of the socioeconomic and demographic characteristics of the caregivers with their Knowledge, Attitudes, and Practices (KAP)

VARIABLES	KNOWLEDGE		ATTITUDES		PRACTICES	
	r	P-value	r	P-value	r	P-value
Sex	0.165	0.208	-0.025	0.852	0.145	0.267
Relationship	-0.109	0.409	-0.113	0.388	0.090	0.492
Age	0.060	0.649	0.143	0.274	0.160	0.221
Highest educational attainment	0.155	0.236	-0.072	0.585	-0.043	0.742
Employment status	0.052	0.694	0.243	0.062	0.127	0.333
Monthly household income	0.157	0.230	-0.021	0.875	0.025	0.851
Household size	-0.179	0.172	-0.001	0.997	-0.052	0.691
Main source of drinking water	-0.101	0.441	-0.093	0.481	0.089	0.501
Water safety practices	-0.097	0.463	-0.179	0.171	-0.2021	0.123
Main source of water (for cooking and washing hands)	-0.112	-0.393	-0.057	0.665	0.128	0.330

*Significant at p value < 0.05

aligns with Olatona et al. [43], who found that maternal education and younger age were linked to knowledge about complementary feeding. In contrast, caregivers who practiced safe water habits (i.e., boiling and letting water settle before use or opting for bottled water) tended to have less favorable attitudes toward exclusive breastfeeding (p=0.003). This result may be related to the mothers who introduced infant feeding formula while maintaining good water safety practices.

Table 7. Relationship between specific components of KAP with the socioeconomic and demographic characteristics and water sanitation practices of the caregivers

VARIABLE	Respondents (n=60)	
	r	P-value
K2: Colostrum		
Highest educational attainment	0.348	0.007
K6: Reason for giving complementary foods		
Caregiver's age	-0.293	0.023
Highest educational attainment	0.328	0.010
A3: Exclusive breastfeeding		
Water safety practices	-0.375	0.003
A4: Continuing breastfeeding beyond six months		
Main source of drinking water	-0.301	0.020
A5: Age of start of complementary foods		
Main source of drinking water	-0.288	0.026
P1: Initiation of breastfeeding		
Employment status	0.296	0.022

*Significant at p-value < 0.05

In contrast, caregivers who promoted exclusive breastfeeding may have confidence in the potability of water from Mt. Isarog, potentially overlooking the safety measures for water. Furthermore, the household's primary drinking water source was found to have a negative correlation with attitudes toward continuing breastfeeding (p=0.02) and introducing complementary foods at six

months ($p=0.026$), suggesting a greater likelihood of holding positive attitudes when the water source is available within the home. Additionally, unemployed caregivers were more likely to initiate breastfeeding within an hour of birth ($p=0.022$), possibly due to increased participation in barangay nutrition programs. Conversely, employed caregivers encountered time constraints as impediments to participating in these programs. In a study by Win and Shafiquem [44], similar findings demonstrated that maternal employment was associated with a significant rise in the likelihood of child stunting.

3.7 Relationship between Socioeconomic and Demographic Characteristics and Water Sanitation Practices of Caregivers and Nutritional Status of Children

Table 8 shows the relationship between socioeconomic and demographic characteristics caregivers' water sanitation practices and their children's nutritional status. The study found significant correlations between WFA and the employment status of caregivers ($p=0.025$), as well as HFA and the caregiver-child relationship ($p=0.012$). A weak positive correlation between WFA and caregiver employment was observed, indicating that children are more likely to have normal WFA when caregivers are unemployed or stay home.

This finding is consistent with the study of Chowdhury [45], which also found significant correlations between the nutritional status of under-five children and maternal employment, noting higher rates of stunting and wasting among working mothers compared to those of unemployed mothers. This suggests that caregivers who typically remain at home have more opportunities to attend to the needs of their children than working mothers who may have less time available to oversee their children.

Table 8. Relationship of the socioeconomic and demographic characteristics with the nutritional status of the children 6-23 months old in Brgy. Panicuason, Naga City

VARIABLES	WFA		HFA		WFH	
	r	P-value	r	P-value	r	P-value
Sex	0.248	0.056	0.107	0.415	-0.043	0.747
Relationship	-0.248	0.056	-0.322	0.012*	0.043	0.747
Age	0.048	0.716	0.094	0.476	-0.127	0.335
Highest educational attainment	-0.114	0.386	-0.158	0.228	0.078	0.551
Employment status	0.290	0.025*	0.061	0.642	0.070	0.596
Monthly household income	0.175	0.180	0.023	0.859	0.121	0.358
Household size	0.087	0.509	-0.245	0.060	0.022	0.865
Main source of drinking water	0.029	0.826	-0.113	0.389	0.045	0.733
Water safety practices	-0.052	0.696	0.013	0.923	-0.137	0.297
Main source of water (for cooking and washing hands)	-0.010	0.940	-0.189	0.149	0.107	0.417

*Significant at p value < 0.05

On the other hand, a weak negative correlation is observed between HFA and caregivers being the mother or father, indicating that children are more likely to have normal HFA when caregivers are not the parents. However, this finding could be influenced by the predominance of parental caregivers in the sample (93.3%), potentially limiting generalizability to other caregiver types.

4 Conclusion and Recommendations

Addressing undernutrition requires tackling underlying causes such as inadequate caregiving and feeding practices. In Brgy. Panicuason, Naga City, a higher prevalence of stunted and severely stunted children has been observed compared to other barangays in the city. Hence, the current study aimed to assess caregivers' knowledge, attitudes, and practices (KAP) regarding complementary feeding for children aged 6-23 months in Barangay Panicuason, Naga City.

The findings of the study highlighted substantial challenges in the living conditions of the caregivers, particularly their educational attainment, occupation, and household income. Despite the majority having a low family income, the household size range (4-5) is considered average. Notably, 58.3% of caregivers practiced safe water consumption methods or used bottled water, potentially improving the nutrition of the children and appropriate complementary feeding practices. The prevalence of undernutrition was evident across all forms, emphasizing the urgent action needed to address underweight (10.0%) and stunting (23.4%), with wasting cases noted at 5.0%. A weak positive correlation was found between caregiver knowledge and children's weight-for-age (WFA) and height-for-age (HFA) ($p < 0.05$). While caregivers demonstrated moderate knowledge and positive attitudes, practices were generally poor. These findings are supported by the significant moderate positive correlation between caregiver knowledge and practices.

In conclusion, the study emphasizes the need to address factors contributing to undernutrition such as insufficient awareness of proper complement feeding and improper childcare practices. Moreover, it was found that determining the factors contributing to undernutrition is crucial in strategizing targeted interventions to improve caregiver practices and overall child nutrition outcomes. To improve the knowledge and practices of caregivers, the study recommends conducting nutrition education interventions on infant and young child feeding among caregivers in the barangay. Moreover, it is recommended that comprehensive monitoring and evaluation schemes be conducted. Distributing evaluation forms among caregivers would assess the program's impact and identify areas for improvement to encourage further caregiver participation. Addressing socioeconomic factors impacting KAP, particularly among employed, older, and less educated caregivers, is essential for enhancing complementary feeding practices and improving children's nutritional outcomes. Lastly, conducting further research to explore the correlation between caregiver-child relationships and children's nutritional status is recommended to inform more targeted interventions in the future.

Supplementary Material

[Research Instruments and Analysis Results \[10\]](#)

Statements and Declarations

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Data Availability

The data in this study are available upon request from the authors.

Ethical Considerations

Ethical considerations for this study included obtaining informed consent from participants prior to conducting interviews. The consent process provided a thorough and clear explanation of the study's relevance, participation criteria, voluntary nature, expected duration, and privacy measures. All personal information collected from participants was kept confidential and anonymous.

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Competing Interest

The authors declare no conflicts of interest.

Authors Contribution

J.A.A. formulated the study, developed tools, conducted data collection and analysis, and drafted and finalized the manuscript. **R.T.N.F.** and **A.C.C.** restructured, proofread, validated, reviewed, and refined the manuscript.

References

- [1] Capra, M. E., Decarolis, N. M., Monopoli, D., Laudisio, S. R., Giudice, A., Stanyevic, B., Esposito, S., & Biasucci, G. (2024). Complementary feeding: Tradition, innovation and pitfalls. *Nutrients*, *16*(5), 737. <https://doi.org/10.3390/nu16050737>
- [2] Brown, J. E., Isaacs, J. S., Krinke, U. B., Lechtenberg, E., Murtaugh, M. A., Sharbaugh, C., Splett, P. L., Stang, J., & Wooldridge, N. H. (2017). *Nutrition through the life cycle*. Cengage Learning Boston (MA).
- [3] Smith, A. E., Shah, M., & Badireddy, M. (2023). Failure to thrive. In *Statpearls [internet]*. StatPearls Publishing.
- [4] Michaelsen, K. F., Grummer-Strawn, L., & Bégin, F. (2017). Emerging issues in complementary feeding: Global aspects. *Matern Child Nutr*, *13*(S2), e12444. <https://doi.org/10.1111/mcn.12444>
- [5] UNICEF. (2021). *Southeast asia regional report on maternal nutrition and complementary feeding*. <https://www.unicef.org/eap/media/9466/file/Maternal>

- [6] Mbuya, N. V., Demombynes, G., Piza, S. F. A., & Adona, A. J. V. (2021). *Undernutrition in the Philippines: Scale, scope, and opportunities for nutrition policy and programming*. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/798061619807652635/Undernutrition-in-the-Philippines-Scale-Scope-and-Opportunities-for-Nutrition-Policy-and-Programming>
- [7] Cook, E. J., Powell, F. C., Ali, N., Penn-Jones, C., Ochieng, B., & Randhawa, G. (2021). Parents' experiences of complementary feeding among a United Kingdom culturally diverse and deprived community. *Maternal & Child Nutrition*, 17(2), e13108. <https://doi.org/10.1111/mcn.13108>
- [8] Congress of the Philippines. (2018). *Kalusugan at nutrisyon ng mag-nanay act, Rep. Act No. 11148*. <https://issuances-library.senate.gov.ph/sites/default/files/2023-02/ra%252011148.pdf>
- [9] Baldemoro, E. S., & Agarpao, J. A. (2022). *City of Naga Ordinance No. 22-034*. Naga City, Philippines: Tanggapan ng Sanguniang Panglungsod. <https://www2.naga.gov.ph/wp-content/uploads/2022/06/ord2022-034.pdf>
- [10] Aga, J. A. (2023). *Knowledge, attitude and practices on complementary feeding of caregivers with children 6-23 months old in Brgy. Panicuason, Naga City*. [Undergraduate Thesis] University of the Philippines Los Baños. <https://www.ukdr.uplb.edu.ph/etd-undergrad/9265>
- [11] DOST-FNRI. (2015). *8th National Nutrition Survey Government Program Participation*. Taguig City, Metro Manila: Food and Nutrition Research Institute- Department of Science and Technology. <https://www.fnri.dost.gov.ph/index.php/nutrition-statistic/19-nutrition-statistic/118-%208th-national-nutrition-survey> Retrieved 12 July 2022.
- [12] Mariás, Y., & Glasauer, P. (2014). *Guidelines for assessing nutrition-related knowledge, attitudes and practices*. Rome, Italy: Food; Agriculture Organization of the United Nations (UN-FAO). www.fao.org/4/i3545e/i3545e.pdf
- [13] Data4Diets. (2023). *Building blocks for diet-related food security analysis, version 2.0*. Boston, MA: Tufts University. <https://index.nutrition.tufts.edu/data4diets> Retrieved 15 December 2022.
- [14] WHO. (2010). *Indicators for assessing infant and young child feeding practices, part 2 measurement*. World Health Organization. http://apps.who.int/iris/bitstream/handle/10665/44306/9789241599290_eng.pdf;jsessionid=608FCC681897738719458BA7D17F59CD?sequence=1
- [15] Bloom, B. S. (1968). Learning for mastery. instruction and curriculum. regional education laboratory for the carolinas and virginia, topical papers and reprints, number 1. *Evaluation comment*, 1(2), n2.
- [16] De Onis, M., Borghi, E., Arimond, M., Webb, P., Croft, T., Saha, K., De-Regil, L. M., Thuita, F., Heidkamp, R., Krasevec, J., et al. (2019). Prevalence thresholds for wasting, overweight and stunting in children under 5 years. *Public health nutrition*, 22(1), 175–179. <https://doi.org/10.1017/S1368980018002434>
- [17] Evans, J. D. (1996). *Straightforward statistics for the behavioral sciences*. Thomson Brooks/Cole Publishing Co.
- [18] PSA. (2021). *Proportion of Poor Filipinos Registered at 23.7 Percent in the First Semester of 2021*. Philippine Statistics Authority. <https://psa.gov.ph/content/proportion-poor-filipinos-registered-237-percent-first-semester-2021> Retrieved 15 July 2022.
- [19] Rivera, J. P. R., & See, K. G. T. (2011). Limiting family size through the sufficient provision of basic necessities and social services: The case of Pasay, Eastern Samar, and Agusan Del Sur. In *Dlsu-aki working paper series 2011-013*. Manila, Philippines: De La Salle University. https://animorepository.dlsu.edu.ph/res_aki/48/ Retrieved 15 December 2022.

- [20] Fusco, A., & Islam, N. (2020). Household size and poverty. In *Inequality, redistribution and mobility* (pp. 151–177). Emerald Publishing Limited. <https://doi.org/10.1108/S1049-258520200000028006>
- [21] Mutuku, J. N., Ochola, S., & Osero, J. (2020). Maternal knowledge and complementary feeding practices and their relationship with nutritional status among children 6-23 months old in pastoral community of Marsabit County, Kenya: A cross-sectional study. *Current Research in Nutrition and Food Science Journal*, 8(3), 862–876. <https://doi.org/10.12944/CRNFSJ.8.3.17>
- [22] Choudhary, N., Schuster, R. C., Brewis, A., & Wutich, A. (2021). Household water insecurity affects child nutrition through alternative pathways to WASH: evidence from India. *Food and Nutrition Bulletin*, 42(2), 170–187. <https://doi.org/10.1177/0379572121998122>
- [23] Saaka, M., Saapiire, F. N., & Dogoli, R. N. (2021). Independent and joint contribution of inappropriate complementary feeding and poor water, sanitation and hygiene (WASH) practices to stunted child growth. *Journal of Nutritional Science*, 10, e109. <https://doi.org/10.1017/jns.2021.103>
- [24] DOST-FNRI. (2022). *2018-2019 Expanded National Nutrition Survey*. Taguig City, Metro Manila: Food & Nutrition Research Institute- Department of Science; Technology. https://enutrition.fnri.dost.gov.ph/uploads/2018-%202019%20ENNS%20FACTS%20AND%20FIGURES_JULY182023.pdf Retrieved 16 December 2022.
- [25] Siddiq, M., Zubair, A., Kamal, A., Ijaz, M., & Abushal, T. (2022). Prevalence and associated factors of stunting, wasting and underweight of children below five using quintile regression analysis (PDHS 2017–2018). *Scientific Reports*, 12(1), 20326. <https://doi.org/10.1038/s41598-022-24063-2>
- [26] Watson, D., Mushamiri, P., Beeri, P., Rouamba, T., Jenner, S., Proebstl, S., Kehoe, S. H., Ward, K. A., Barker, M., Lawrence, W., et al. (2023). Behaviour change interventions improve maternal and child nutrition in sub-Saharan Africa: A systematic review. *PLOS Global Public Health*, 3(3), e0000401. <https://doi.org/10.1371/journal.pgph.0000401>
- [27] Assefa, D. G., Woldesenbet, T. T., Molla, W., Zeleke, E. D., & Simie, T. G. (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. *Archives of Public Health*, 79, 1–10. <https://doi.org/10.1186/s13690-021-00690-5>
- [28] Bimpong, K. A., Cheyuo, E. K.-E., Abdul-Mumin, A., Ayanore, M. A., Kubuga, C. K., & Mogre, V. (2020). Mothers' knowledge and attitudes regarding child feeding recommendations, complementary feeding practices and determinants of adequate diet. *BMC nutrition*, 6, 1–8. <https://doi.org/10.1186/s40795-020-00393-0>
- [29] Shrestha, S., Pokhrel, M., & Mathema, S. (2020). Knowledge, attitude and practices among mothers of children 6 to 24 months of age regarding complementary feeding. *JNMA: Journal of the Nepal Medical Association*, 58(230), 758. <https://doi.org/10.31729/jnma.5274>
- [30] Eicher-Miller, H. A., Graves, L., McGowan, B., Mayfield, B. J., Connolly, B. A., Stevens, W., & Abbott, A. (2023). A scoping review of household factors contributing to dietary quality and food security in low-income households with school-age children in the United States. *Advances in Nutrition*, 14(4), 914–945. <https://doi.org/10.1016/j.advnut.2023.05.006>
- [31] Dukuzumuremyi, J. P. C., Acheampong, K., Abesig, J., & Luo, J. (2020). Knowledge, attitude, and practice of exclusive breastfeeding among mothers in East Africa: A systematic review. *International breastfeeding journal*, 15, 1–17. <https://doi.org/10.1186/s13006-020-00313-9>
- [32] Raihana, S., Alam, A., Chad, N., Huda, T. M., & Dibley, M. J. (2021). Delayed initiation of breastfeeding and role of mode and place of childbirth: Evidence from health surveys in 58 low-and middle-income countries (2012–2017). *International Journal of Environmental Research and Public Health*, 18(11), 5976. <https://doi.org/10.3390/ijerph18115976>

- [33] Jain, S., Thapar, R., & Gupta, R. (2018). Complete coverage and covering completely: Breast feeding and complementary feeding: Knowledge, attitude, and practices of mothers. *Medical Journal Armed Forces India*, 74(1), 28–32. <https://doi.org/10.1016/j.mjafi.2017.03.003>
- [34] WHO & UNICEF. (2021). *Indicators for assessing infant and young child feeding practices: Definitions and measurement methods*. Geneva: World Health Organization (WHO); the United Nations Children's Fund (UNICEF). <https://iris.who.int/bitstream/handle/10665/340706/9789240018389-%20eng.pdf?sequence=1>
- [35] Tharanitharan, P., & Sathiadas, M. (2020). Knowledge and attitude on complementary feeding practices among parents or main caregivers of children aged less than six months admitted to paediatric wards at TH/Jaffna. *Jaffna Medical Journal*, 32(2), 11–17. <https://doi.org/10/4038/jmj.v32i2.102>
- [36] Saaka, M., Awini, S., & Nang, E. (2022). Prevalence and predictors of appropriate complementary feeding practice among mothers with children 6–23 months in Northern Ghana. *World Nutrition*, 13(2), 14–23. <https://doi.org/10.26596/wn.202213214-23>
- [37] Dallmann, D., Marquis, G. S., Colecraft, E. K., Kanlisi, R., & Aidam, B. A. (2022). Maternal participation level in a nutrition-sensitive agriculture intervention matters for child diet and growth outcomes in rural Ghana. *Current Developments in Nutrition*, 6(3), nzac017. <https://doi.org/10.1093/cdn/nzac017>
- [38] Kwerengwe, R. I., & Singh, K. (2023). Impact of knowledge, attitude and practice of mothers regarding complementary feeding on the nutritional status of children. *SALT Journal of Scientific Research in Healthcare*, 3(2), 01–12. <https://doi.org/10.56735/saltjsrh.ms2303020112>
- [39] Ntuiyo, N. D., Tambipi, S., & Nurkamiden, S. S. (2021). The relationship between maternal behavior in feeding and nutritional status of infants 6-24 months old in marisa selatan village of marisa sub-district, pohuwato regency. *Jurnal Ilmiah dr. Aloe Saboe*, 1(1), 26–34.
- [40] Viajar, R. V., Dorado, J. B., Azaña, G. P., Ibarra, H. A., Ferrer, E. B., & Capanzana, M. V. (2020). Process evaluation of nutrition intervention strategy in a local Philippine setting. *Journal of Primary Care & Community Health*, 11, 2150132720915407. <https://doi.org/10.1177/2150132720915407>
- [41] Nassanga, P., Okello-Uma, I., & Ongeng, D. (2018). The status of nutritional knowledge, attitude and practices associated with complementary feeding in a post-conflict development phase setting: The case of Acholi sub-region of Uganda. *Food science & nutrition*, 6(8), 2374–2385. <https://doi.org/10.1002/fsn3.829>
- [42] Pokharel, P., Adhikari, A., Lamsal, P., & Adhikari, R. (2017). Effect of complementary feeding practices and nutritional status of children (6-23 months) in Tamang community, Ambhanjyang Vdc of Makwanpur. *Janaki Medical College Journal of Medical Science*, 5(1), 22–32. <https://doi.org/10.3126/jmcjms.v5i1.17984>
- [43] Olatona, F. A., Adenihun, J. O., Aderibigbe, S. A., & Adeniyi, O. F. (2017). Complementary feeding knowledge, practices, and dietary diversity among mothers of under-five children in an urban community in lagos state, nigeria. *International Journal of MCH and AIDS*, 6(1), 46. <https://doi.org/10.21106/ijma.203>
- [44] Win, H., Shafique, S., Mizan, S., Wallenborn, J., Probst-Hensch, N., & Fink, G. (2022). Association between mother's work status and child stunting in urban slums: A cross-sectional assessment of 346 child-mother dyads in dhaka, bangladesh (2020). *Archives of Public Health*, 80(1), 192. <https://doi.org/10.1186/s13690-022-00948-6>
- [45] Chowdhury, I. A. Q. (2020). Mothers' employment and nutritional status of under-five children attending selected child welfare centre, dhaka cantonment. *Journal of Armed Forces Medical College, Bangladesh*, 16(1), 58–60. <https://doi.org/10.3329/jafmc.v16i1.53832>