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Knowledge and Practices on Infant Care Among Mothers in Canaman, Camarines Sur: A Mixed Method Approach

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Abstract

The study aimed to determine the knowledge and practices of mothers regarding infant care in the barangays of Canaman, Camarines Sur—specifically Barangay San Juan, San Nicholas, and Palo. It focused on four key domains of infant care: nutrition, immunization, infant safety, and developmental milestones. The study sought to assess the level of maternal knowledge, determine how this knowledge translates into actual caregiving practices, identify any significant differences between the two, and explore contributing factors affecting caregiving behavior. As a final goal, the study aimed to propose a context-based community intervention program that addresses identified gaps.

A mixed-methods approach was employed, using a researcher-made questionnaire validated by health experts to quantitatively assess knowledge and practices. The study utilized purposive sampling involving 208 breastfeeding mothers aged 18 to 45 years with multiparous pregnancies. These mothers were residents of the identified barangays and had infants aged 28 days to 12 months, in line with the WHO's definition of infancy. Socio-demographic data, including educational attainment, household income, and employment status, were collected to examine potential influences on maternal behavior. Qualitative data were gathered through focus group discussions to supplement the quantitative findings and uncover deeper insights into caregiving experiences.

Findings revealed that mothers generally had adequate knowledge of infant care but only moderate application in actual caregiving practices. Immunization and infant safety were found to have higher adherence, while nutrition and developmental care were rated as relatively weak areas in both knowledge and practice. Notably, no strong predictive relationship was observed between knowledge and practices, highlighting the influence of other factors. Qualitative analysis revealed two overarching themes such as "Knowledge on Infant Care Influenced by Varied Sources," and "Navigating Constraints and Motivation in Infant Care. Consequently, a culturally sensitive, community-based education program—"Alaga ni Nanay: Nutrisyon at Kaligtasan para kay Baby"—was proposed to promote sustainable, informed caregiving practices.

Keywords*: knowledge, practices, mothers, infant care, coastal barangays, Camarines Sur, Philippines*

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

INTRODUCTION

Life during the earliest stage of human development lays a vital foundation for lifelong health. Ensuring appropriate care at this stage supports optimal growth and the timely achievement of developmental milestones. Infant care involves both clinical practices and hands-on caregiving grounded in science. While health systems across many regions have made advances, the core principles of quality infant care remain underexplored in community contexts. This gap contributes to the ongoing problem of preventable infant deaths, particularly in areas with limited resources.

The infant stage spans from 28 days after birth to 12 months of age (CDC, 2021; WHO, 2024). The World Health Organization underscores the importance of strengthening health systems through universal health coverage to protect young children (WHO, 2024). However, the global infant mortality rate remains high, with 28 deaths per 1,000 live births recorded in 2021 (The World Bank Group, 2024). Sustainable Development Goal 3 (SDG 3) seeks to reduce preventable deaths among newborns and children under five by improving access to quality health services (UN, 2021). Despite such global efforts, many Southeast Asian nations still fall short of meeting the SDG targets, with infant mortality averaging 24 deaths per 1,000 live births (WHO, 2024).

In Asian settings, infant survival and health are heavily influenced by mothers' knowledge and caregiving practices. Although infant mortality has decreased over the years, disparities in health outcomes persist (Calva & Batoto, 2024). Vulnerable populations—including low-income households, rural communities, and ethnic minorities—face barriers such as limited access to health services, low health literacy, and cultural misconceptions about childrearing. These constraints prevent consistent application of evidence-based infant care, deepening existing health inequalities (Abejo et al., 2024).

In the Philippines, 25.7 infant deaths per 1,000 live births were recorded in 2021 (UNICEF Philippines, 2024). The Bicol region ranked fifth highest in infant mortality across the country in 2020 (PSA, 2024), with a 24.34% increase in 2021 (NEDA, 2023). Preventable diseases such as respiratory infections, diarrhea, measles, malnutrition, and newborn complications were cited as leading causes (UNICEF Philippines, 2023; WHO, 2024). Health outcomes vary across provinces due to differences in healthcare access and the influence of cultural beliefs on childcare (UNICEF Philippines, 2023; Orderud, 2024).

In the municipality of Canaman in Camarines Sur—a fourth-class municipality—three infant deaths were recorded in 2020 (NEDA, 2022). Despite national policies on newborn care, infant deaths continue to occur in geographically isolated and economically disadvantaged areas. Barangays Palo, San Juan, and San Nicolas in Canaman are among the localities where maternal and child health remains a pressing concern. These barangays are particularly at risk due to limited infrastructure and service access, underscoring the need for tailored interventions that consider local conditions and maternal practices.

This study focused on examining the knowledge and practices of mothers in the areas of nutrition, immunization, infant safety, and developmental milestones. The selection of Palo, San Juan, and San Nicolas as study sites was based on their vulnerability and potential for targeted improvement through appropriate planning and intervention. During preliminary visits to these barangays and their health centers, it became evident that gaps in maternal knowledge significantly affect child health outcomes. Guided by this vision, the researcher aimed to assess the level of knowledge and the extent of infant care practices among mothers, specifically in the domains of nutrition, immunization, infant safety, and developmental milestones. These dimensions were chosen because they represent the core pillars of infant care, each

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Volume 1 Issue 8 (2025)

significantly contributing to a child's growth, protection, and well-being during the critical first year of life. Finally, this study is both timely and relevant as it provides an opportunity for systematic observation and data-driven analysis that could lead to a deeper understanding of the factors influencing maternal knowledge and caregiving behavior.

Review of Related Literature

Knowledge on Infant Care Among Mothers

Proper nutrition and correct feeding are pivotal in lowering morbidity and mortality, reducing chronic disease and promoting regular mental and physical development (WHO, 2024). Infant feeding consists of initiation of breastfeeding, exclusive for six months and a continuation of breastfeeding for up to 2 years (Assefa, Okelo, Okullo, Muendo, Wanjohi, Kimani-Murage, and Kitsao-Wekul (2021). While complementary feeding is crucial for bridging nutrition gaps after six (6) months (Muleka Gyimah, Diaz, & Kuhlmann, 2023). The ability to develop, learn and thrive is significantly impacted by how well and poorly mothers feed and care the child for throughout the period (Likhar & Patil, 2022).

Infant nutrition faces significant challenges and varies in nature, region, and community resources (Laxmi et al., 2023; Nyarko et al., 2023). Among high-income countries like America, Europe, and Australia, despite high nutrition literacy and availability of infant feeding guidelines, breastfeeding rates fall below global standards, creating a need for more support for mothers in implementing the best practices for their children (Laxmi et al., 2023). They have shorter breastfeeding duration than those from low-income and middle-income countries (Sisko et al., 2022).

In the Philippines, mothers have high knowledge and positive practices, especially regarding the importance, benefits, and safety of immunization (Arceo et al., 2021). Filipina mothers obtain their knowledge from healthcare workers even during their antenatal visits (Andal et al., 2021). Compared with other Asian countries, the country's immunization program is available in all government facilities for free and easily accessible (Arceo et al., 2021). However, a small percentage of children are not receiving the recommended vaccines (Migriño et al., 2020).

Practices on Infant Care Among Mothers

Nutrition plays a fundamental role in shaping infant health and development, with exclusive breastfeeding emerging as a cornerstone of optimal infant care. Exclusive breastfeeding, defined as feeding an infant only breast milk without supplementary liquids or solids for the first six months, provides essential nutrients and immunological benefits necessary for growth and disease prevention (Alhayli et al., 2024). Research consistently shows that exclusive breastfeeding enhances cognitive development and strengthens the immune system, reducing the incidence of respiratory and gastrointestinal infections (Alqurashi et al., 2021). However, adherence to exclusive breastfeeding practices varies across regions due to social, economic, and cultural influences. Studies indicate that maternal employment and inadequate maternity leave policies often hinder the ability of mothers to breastfeed exclusively, prompting early introduction of formula milk and complementary foods, which can compromise infant health outcomes (Malik et al., 2023). Maternal education and access to antenatal care have been identified as key determinants of breastfeeding success, as mothers who receive breastfeeding guidance during pregnancy are more likely to adopt and sustain exclusive breastfeeding practices (Brito et al., 2021).

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

Statement of The Problem

This study determined the knowledge and practices of mothers towards infant care. Specifically, it answered the following questions:

1. What is the level of knowledge of the respondents on infant care along:
    a. Nutrition
    b. Immunization
    c. Infant's safety
    d. Developmental milestones?
2. What is the extent of infant care practices provided by the respondents?
3. Are there significant differences in the knowledge and practices of the respondents along the four aspects?
4. Is there a significant relationship between the mothers' knowledge and their practices towards infant care?
5. What other factors contribute to the respondent's level of knowledge and practices on infant care?
6. What nutrition and safety program may be proposed based on the results of the study?

Objectives

1. To determine the level of knowledge of the respondents on infant care along:
    a. Nutrition
    b. Immunization
    c. Infant's safety
    d. Developmental milestones;
2. To ascertain the extent of infant care practices provided by the respondents
3. To determine if there are significant differences in the knowledge and practices of the respondents along the four aspects
4. To determine if there is a significant relationship between the mothers' knowledge and their practices towards infant care
5. To determine what other factors, contribute to the respondent's level of knowledge and practices on infant care?
6. To propose nutrition and safety program may be proposed based on the results of the study?

METHODOLOGY

Research Design

This study utilized a concurrent mixed-methods design to comprehensively examine the knowledge and practices of infant care among mothers.

For the quantitative phase, a descriptive-evaluative-correlational design was adopted. This design aimed to measure, evaluate, and describe the relationship between mothers' levels of knowledge and their extent of practices regarding infant care. It also assessed the influence of selected demographic variables and healthcare access factors. Descriptive statistics such as frequency and mean were used to summarize the data, while Pearson's correlation coefficient was employed to determine the relationships between variables.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

For the qualitative phase, a descriptive research design was used to explore in detail the contextual experiences and perceptions of mothers regarding infant care. This design provided the flexibility to gather rich, narrative data that captured subjective insights on aspects such as breastfeeding, immunization, nutrition, hygiene, safety, and developmental monitoring.

Participants

This study was conducted in the barangays of San Juan, Palo, and San Nicolas in Canaman, Camarines Sur, which were identified to have the highest negative population growth rates from 2015 to 2020 (NEDA, 2022). The respondents were selected using a mixed sampling method. For the quantitative phase, a multi-stage sampling design was integrated to systematically reduce the sample pool into manageable units. Only households with eligible female members—specifically, mothers of reproductive age—were considered for inclusion.

The study targeted a total of 208 respondents. The inclusion criteria for the selection of participants were as follows: (a) mothers aged 18 to 45 years old, regardless of marital status, who were willing to participate and signed the informed consent form; (b) multiparous mothers currently caring for an infant older than 28 days but younger than 12 months during the time of data collection; and (c) those who had resided in Canaman, Camarines Sur for at least one year prior to the conduct of the study.

Instruments

The data collection instrument used in this study was developed specifically for the quantitative phase and was informed by an extensive review of related literature. The researcher initially designed the questionnaire in English; to ensure clarity and cultural appropriateness, it was translated into Bikol Naga—the local dialect spoken in Camarines Sur. To preserve meaning and linguistic integrity, a back-translation to English was conducted, thereby validating semantic consistency and contextual relevance during administration.

Two types of self-made tools were employed in this study. The primary instrument for the quantitative data collection was a paper-and-pencil checklist composed of two serial parts. Prior to final implementation, the tool underwent rigorous psychometric evaluation. Internal consistency was assessed using Cronbach's Alpha, which yielded a reliability coefficient of 0.91, indicating excellent reliability. Additionally, the Split-Half Method was employed to examine the consistency of responses across the two halves of the instrument, further supporting its internal reliability.

A research specialist was engaged to conduct a detailed line-by-line content validation of the instrument to ensure that the items were conceptually and contextually appropriate. Following expert validation, the instrument was pretested with approximately 5% of the total sample size to examine its clarity, relevance, and applicability in the local setting. Revisions were implemented based on the pretest feedback to finalize the instrument for large-scale administration.

Parts 1 and 2 each consisted of 20 items structured along a 4-point Likert scale designed to measure, respectively, the level of knowledge and the extent of infant care practices. The scale was coded as follows: 1 for "strongly disagree," 2 for "disagree," 3 for "agree," and 4 for "strongly agree." To comprehensively reflect key aspects of infant care, items in both parts were thematically categorized into four indicators: nutrition, immunization, infant safety, and developmental milestones. In Part 1, nutrition-related knowledge

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

included understanding of breastfeeding, complementary feeding, and weaning; immunization items assessed knowledge of vaccine schedules, purposes, and health benefits; safety-related items addressed hygiene, accident prevention, and home safety; while developmental milestone items examined awareness of infants' physical, cognitive, and emotional growth during the first year. Part 2 examined actual maternal behaviors across the same domains, such as feeding practices, immunization adherence, infant-proofing the home, and daily stimulation activities to support infant development.

For the qualitative component of the study, a separate tool was designed consisting of semi-structured, open-ended interview questions. These queries were initially scrutinized and validated by a local technical peer group as well as field experts to ensure thematic alignment and appropriateness. Pilot interviews were then conducted with pre-selected individuals to test the feasibility, clarity, and cultural resonance of the questions.

Procedure

Before beginning the data collection process, approval was obtained through a letter signed by the Dean of the Graduate School. Permission to proceed with the study was also granted by the Municipal Health Officer. Waivers and consents were given to the target participants who qualify for the criteria. After signing, the research assistant conducted a house-to-house visit for a survey interview. Mothers who met the study's criteria participated by completing the survey and taking part in an interview after their postnatal consultation at the Barangay Health Stations. They were provided with details about the study's purpose and nature. Those who agreed to participate gave their consent by signing an informed consent form.

For the quantitative phase, thirty minutes were given to the respondents to complete their answers. All answers were then kept in an individualized envelope and coded for confidentiality.

The qualitative phase was based on the research aim to explore the factors affecting the mothers knowledge and practices specifically their existential experiences and challenges relevant to infant care. The researcher invited ten (10) mothers to a pre-arranged venue for FGD. The moderator established ground rules before FGD begins. A research assistant took part as a documenter and did audio recording. The session lasted for 90 minutes. Probing questions was drawn to clarify and validate statements. Data collection continued until no more new data, indicating saturation.

Verbatim was translated and meticulously extracted with the help of a linguist. To validate and reduce discrepancies, the researcher revalidated cues right after both welter and significant statements were given.

Data Analysis

To analyze the data gathered, both quantitative and qualitative methods were employed using appropriate statistical and analytical tools. For the **quantitative data, descriptive statistics,** specifically the **mean,** was utilized to summarize and describe the respondents' level of knowledge and extent of practices on infant care across the four dimensions: nutrition, immunization, infant safety, and developmental milestones. To examine the relationship between the respondents' level of knowledge and their practices on infant care, **Pearson's r** was used as the tool for correlation analysis. Additionally, an analysis of variance (ANOVA) was conducted to determine whether significant differences existed in the respondents' knowledge of infant care across four core aspects: nutrition, immunization, safety, and developmental milestones.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

For the **qualitative phase**, the data collected were analyzed using **Mayring's Qualitative Content Analysis.** This method involved a systematic, rule-guided approach to interpret the textual data (Mayring, 2014). The process began with **transcribing the FGD recordings verbatim,** followed by a careful **reading and re-reading** of the transcripts to ensure familiarity and context immersion. Next, the researcher performed **coding and categorization,** in which key phrases, ideas, and patterns were manually highlighted and grouped into emerging themes and sub-themes.

RESULTS

Table 1
Summary Table on Level of knowledge of the Respondents on Infant Care of Mothers

Indicators	Mean	Interpretation
Immunization	3.15	High
Infant's Safety	2.95	High
Developmental Milestone	2.88	High
Nutrition	2.85	High
Mean	**2.96**	**High**

Legend: 1.00-1.75 (Very Low), 1.76-2.50 (Low), 2.51-3.25 (High), 3.26-4.00 (Very High)

The data in Table 1 presents a summary of the respondents' level of knowledge on different aspects of infant care. The indicators measured in Table 1 include nutrition, immunization, infant safety, and developmental initiatives. Among these, immunization received the highest mean score of 3.15, categorized as "High," indicating that respondents are most knowledgeable about the role of vaccines in protecting infants from infectious diseases.

On the other hand, the lowest-rated indicator among the four domains was nutrition, with a mean score of 2.85, although still categorized as "High." This suggests that while respondents possess foundational knowledge of infant nutrition, gaps remain in understanding appropriate feeding practices, including exclusive breastfeeding, timely introduction of complementary foods, and avoiding harmful traditional practices.

The overall mean score of 2.96 indicates a "High" level of knowledge on infant care, reflecting a solid but not comprehensive understanding of essential childcare practices among respondents. While strengths are evident in immunization awareness, there are clear opportunities for improvement in nutrition, development, and safety knowledge.

Extent of Infant Care Practice

The following tables present the respondents' extent of infant care practice, focusing on four key dimensions: nutrition, immunization, infant safety, and developmental milestones.

Table 2
Summary Table Extent of Infant Practices Provided by the Respondents

Indicators	Mean	Interpretation
Infant's Safety	3.30	Very High
Immunization	3.02	High
Nutrition	2.96	High

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

Developmental Initiatives	2.82	High
Mean	**3.03**	**High**

Legend: 1.00-1.75 (Very Low), 1.76-2.50 (Low), 2.51-3.25 (High), 3.26-4.00 (Very High)

The data in Table 2 presents a summary of the extent of infant care practices provided by the respondents across four key domains: nutrition, immunization, infant safety, and developmental initiatives. Among these, infant safety received the highest rating, with a mean score of 3.30, categorized as "Very High." This indicates that respondents prioritize safeguarding their infants from hazards, such as preventing exposure to choking risks, burns, and electrical injuries. The high rating suggests that caregivers are well-informed and proactive in creating secure environments for infants.

In contrast, developmental initiatives received the lowest mean score of 2.82, though still classified as "High." This lower score indicates that while respondents engage in some developmental practices, activities like reading, storytelling, and verbal engagement may not be fully integrated into daily routines. The overall mean score of 3.03 classifies the respondents' infant care practices as "High," indicating a generally strong and well-rounded application of essential caregiving practices.

Significant Differences in the Knowledge and Practices of the Respondents

An analysis of variance (ANOVA) was conducted to determine whether significant differences existed in the respondents' knowledge of infant care across four core aspects: nutrition, immunization, safety, and developmental milestones.

Table 3

Significant Differences in the Knowledge on Infant Care along the Four Aspects

	Sum of Squares	**Df**	**Mean Square**	**F**	**p-value**	**Interpretation**
Between Groups	9.717	3	3.239			Very highly
Within Groups	62.141	740	.084	38.572	.000	significant
Total	71.858	743				

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

An analysis of variance (ANOVA) was conducted to determine whether significant differences existed in the respondents' knowledge of infant care across four core aspects: nutrition, immunization, safety, and developmental milestones. The results showed a statistically significant difference among these groups, $F(3, 740) = 38.57$, $p = .000$, indicating a very highly significant variation in knowledge depending on the specific aspect considered.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

Table 4

Tukey HSD Multiple Comparisons Table on the Differences in the Knowledge of the Respondents on Infant Care along the Four Aspects

(I) aspect	(J) aspect	Mean Difference (I-J)	p-value	Interpretation
Nutrition	Immunization	-.29140*	.000	Very Highly Significant
	Safety	-.09892*	.006	Highly Significant
	milestone	-.02473	.844	Not Significant
Immunization	Safety	.19247*	.000	Very Highly Significant
	milestone	.26667*	.000	Very Highly Significant
Safety	milestone	.07419	.066	Highly Significant

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

A Tukey HSD post hoc test was conducted to pinpoint which specific knowledge domains differed significantly from each other. The findings revealed that respondents scored significantly lower in nutrition-related knowledge compared to both immunization (p = .000) and safety (p = .006), but showed no significant difference from the milestone aspect (p = .844). Furthermore, immunization knowledge was significantly higher than both safety and milestone knowledge (p = .000 in both comparisons), and no statistically significant difference was found between safety and milestone knowledge (p = .066followed by safety (M = 2.95), milestones (M = 2.88), and nutrition (M = 2.85).

Table 5

Significant Differences in the Extent of Practices of the Respondents on Infant Care along the Four Aspects

	Sum of Squares	Df	Mean Square	F	p-value	Interpretation
Between Groups	22.333	3	7.444	90.662	.000	very highly significant
Within Groups	60.762	740	.082			
Total	83.095	743				

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

Another ANOVA was performed to assess whether the actual practices of the respondents differed significantly across the same four aspects of infant care. The results showed a very highly significant difference, F(3, 740) = 90.66, p = .000, indicating that respondents' caregiving behaviors varied meaningfully across the domains.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

Table 6

Tukey HSD Multiple Comparisons Table on the Differences in the Extent of Practices of the Respondents on Infant Care along the Four Aspects

(I) aspect	(J) aspect	Mean Difference (I-J)	Sig.	Interpretation
Nutrition	Immunization	-.06344	.143	Not Significant
	Safety	-.33441*	.000	Very Highly Significant
	Milestone	.14301*	.000	Very Highly Significant
Immunization	Safety	-.27097*	.000	Very Highly Significant
	Milestone	.20645*	.000	Very Highly Significant
Safety	Milestone	.47742*	.000	Very Highly Significant

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

The Tukey HSD post hoc analysis of caregiving practices further clarified where these differences occurred. Practices concerning nutrition and immunization did not significantly differ from each other (p = .143), but both were significantly different from safety and milestone-related practices (p = .000). Safety-related behaviors emerged as the most consistently practiced (M = 3.30), while milestone-related behaviors were practiced the least (M = 2.82).

Table 7

Significant Relationship Between the Mother's Knowledge and their Practices towards Infant Care

Aspects of Knowledge	Aspects of Practices	Correlation	P-Value	Interpretation
Nutrition	Nutrition	.002	.976	Not Significant
	Immunization	-.027	.711	Not Significant
	Safety	-.147	.045	Significant
	Milestone	.099	.179	Not Significant
Immunization	Nutrition	.057	.440	Not Significant
	Immunization	-.120	.102	Not Significant
	Safety	.666	.186	Not Significant
	Milestone	-.004	.958	Not Significant
Safety	Nutrition	.063	.390	Not Significant
	Immunization	.067	.367	Not Significant
	Safety	.032	.662	Not Significant
	Milestone	-.023	.754	Not Significant
Milestone	Nutrition	.149	.042	Significant
	Immunization	.024	.745	Not Significant
	Safety	-.084	.256	Not Significant
	Milestone	.131	.074	Not Significant
Knowledge	Practices	.037	.619	Not Significant

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

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https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

Table 7 presents the correlation between mothers' knowledge and their actual caregiving practices on infant care across four major domains: nutrition, immunization, infant safety, and developmental milestones. In terms of infant nutrition, the correlation between knowledge and practice was positive but extremely weak (r = .002, p = .976), and statistically insignificant.

Factors that Contribute to the Respondents' Level of Knowledge and Practices on Infant Care

Based on the responses gathered from the focus group discussions with mothers of infants, two major themes emerged that explain the factors that contribute to their level of knowledge and practices in infant care. 1. Knowledge on infant care influenced by varied sources with sub-themes: Health workers and community programs as trusted sources, Online media as double-edged sources of information, Traditional beliefs and advice from elders, and Partner involvement as a support mechanism. 2. **Navigating constraints and motivation in infant care practices** with sub-themes: Financial constraints as a major barrier, Workload and fatigue hindering consistent care, Internal motivation and self-initiated learning, and Learning from experience builds confidence.

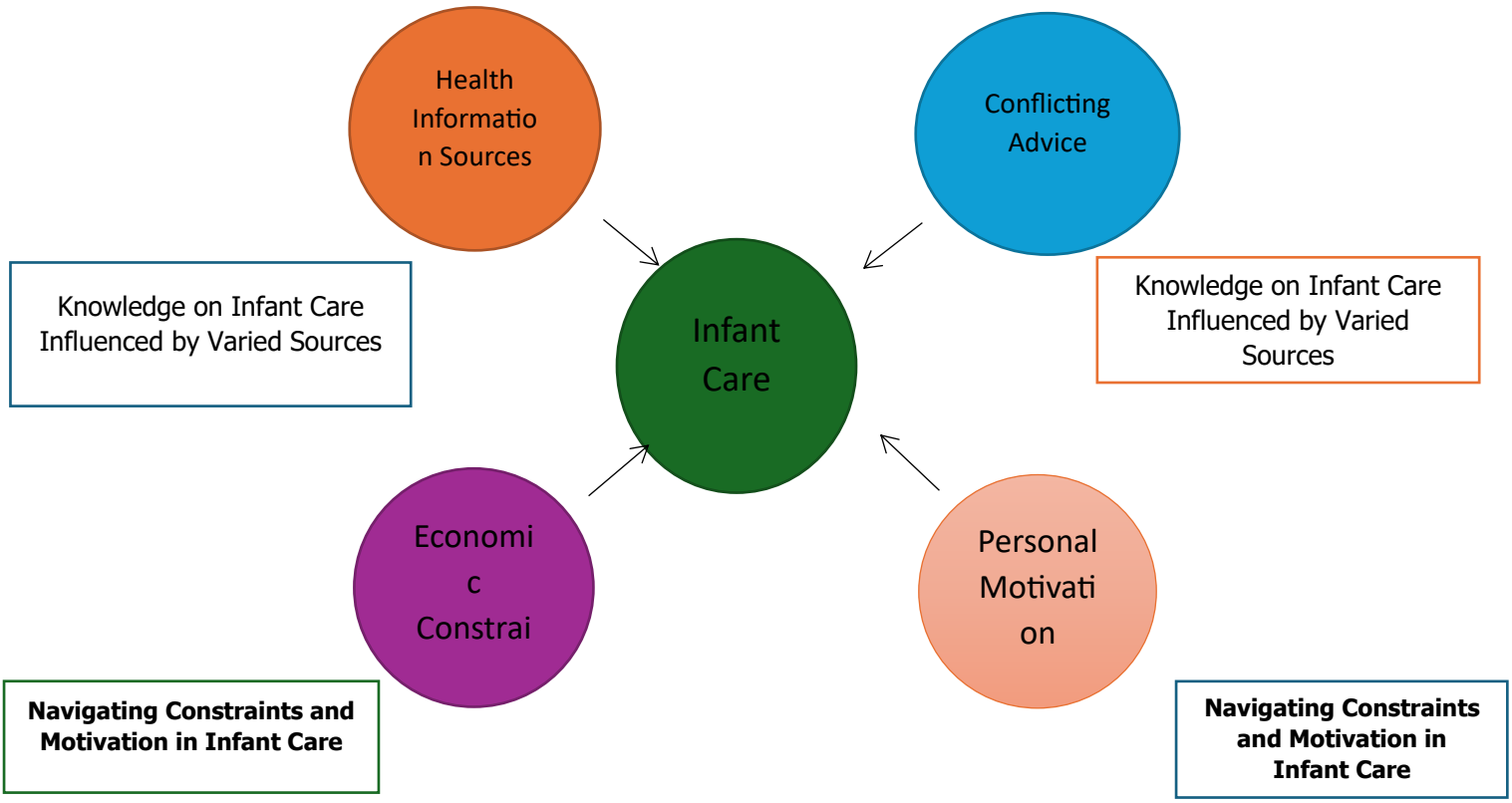

Figure 1. Thematic Figure on the Summary of Themes on Infant Care

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal
of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

DISCUSSION

Level of Knowledge of the Respondents on Infant Care of Mothers

Most mothers are well-informed about the importance, schedule, and benefits of immunizing their infants, possibly due to intensified public health campaigns and access to information from healthcare providers. Also, mothers possess substantial knowledge on how to prevent accidents and ensure a secure environment for their babies. Meanwhile, Developmental Milestone and Nutrition have slightly lower but still high scores, which could suggest that while mothers are aware of the importance of these areas, there might be some gaps in understanding the specific signs of developmental progress and the nutritional needs of infants at various stages. This confirms a high level of knowledge among the respondents, which is crucial in promoting optimal infant growth and reducing risks of morbidity.

The Centers for Disease Control and Prevention (CDC, 2021) emphasize that vaccine-preventable diseases remain a major contributor to infant morbidity and mortality, underscoring the importance of maintaining high levels of immunization awareness. Similarly, the World Health Organization (WHO, 2024) asserts that routine immunization is one of the most effective interventions to reduce child mortality worldwide. Studies by Karuppanannan et al. (2020) and Gondim et al. (2022) reveal that in many low- and middle-income countries, including the Philippines, maternal education often neglects aspects of child development such as motor skills, cognitive growth, and emotional nurturing.

Extent of Infant Practices Provided by the Respondents

The result suggests that mothers are actively implementing safety practices such as proper handling, safe sleeping arrangements, and household hazard prevention. This high application rate may be attributed to the perceived immediate risks associated with neglecting safety. Immunization Nutrition, and Developmental Initiatives were all rated “High,” signifying that mothers are also practicing recommended infant care behaviors in these areas. However, the relatively lower mean for Developmental Initiatives indicates a need for greater emphasis on stimulating infant development through play, communication, and responsive caregiving. The findings suggest that while knowledge translates into action in most domains, actual practices related to development may not be as consistently applied.

Research by the American Academy of Pediatrics (AAP, 2023) highlights that consistent safety practices—such as covering outlets, preventing falls, and maintaining a smoke-free environment—are crucial in reducing unintentional injuries among young children. Martinez et al. (2022) further affirm that caregiver vigilance in home safety significantly lowers the risk of domestic accidents during early childhood, contributing to better health outcomes and infant well-being. Gonzalez et al. (2022) emphasize that early exposure to language through reading and interactive communication plays a critical role in shaping literacy skills and brain development.

Significant Differences in the Knowledge and Practices of the Respondents

This result suggests that mothers possess irregular levels of knowledge across different dimensions of infant care. Some aspects are clearly more familiar and better understood than others. The implication of this finding is that educational interventions for mothers should not take a one-size-fits-all approach. Rather, they must be tailored to address gaps in understanding, particularly in those domains where knowledge is weakest. Health educators, barangay health workers, and local health units should consider designing

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 8 (2025)

focused training programs that give greater emphasis to nutrition and milestone tracking, as these areas appear to be less well understood.

Furthermore, the findings reveal that although mothers generally possess good knowledge regarding immunization—likely due to consistent national campaigns and local health efforts—there is comparatively less understanding of nutritional guidelines and developmental milestones.

According to Karuppannan et al. (2020), knowledge disparities in maternal and infant care are common in low- and middle-income countries, where health information is often delivered in fragmented or generalized formats. Their study highlighted that while immunization knowledge is typically widespread due to strong national campaigns, areas such as early developmental milestones and nutritional practices remain poorly understood. According to the World Health Organization (Parker et al., 2021), global immunization coverage for children has steadily improved due to integrated efforts by health ministries, media advocacy, and routine services provided through local health units. In the Philippines, the Department of Health (DOH) and community health centers routinely implement outreach and education programs on vaccines, contributing to high levels of maternal knowledge in this area (Meek et al., 2022).

Significant Relationship Between the Mother's Knowledge and their Practices towards Infant Care

The findings reveal complex and sometimes counterintuitive relationships, suggesting that knowledge alone does not necessarily lead to aligned caregiving behaviors. In terms of infant nutrition, the correlation between knowledge and practice was positive but extremely weak, and statistically insignificant. This indicates that although mothers may understand the importance of breastfeeding or appropriate weaning, such knowledge often does not translate into consistent nutritional behavior.

Pender's Health Promotion Model is particularly useful in understanding this disconnect. The theory emphasizes that health-promoting behavior is shaped by a dynamic combination of personal experiences, environmental context, self-perception, and available support. It underscores the need to go beyond traditional health education and design multi-dimensional interventions that reduce barriers, build confidence, and embed support systems that translate knowledge into sustainable practice.

Factors that Contribute to the Respondents' Level of Knowledge and Practices on Infant Care

There are two major themes emerged that explain the factors that contribute to their level of knowledge and practices in infant care. 1. Knowledge on infant care influenced by varied sources with sub-themes: Health workers and community programs as trusted sources, Online media as double-edged sources of information, Traditional beliefs and advice from elders, and Partner involvement as a support mechanism. 2. **Navigating constraints and motivation in infant care practices** with sub-themes: Financial constraints as a major barrier, Workload and fatigue hindering consistent care, Internal motivation and self-initiated learning, and Learning from experience builds confidence.

This aligns with the findings of Nguyen et al. (2021), who emphasized that community-based health education improves maternal adherence to safe infant care practices. Furthermore, maternal engagement with primary healthcare services has been positively associated with reduced child morbidity and mortality (Yaya et al., 2020). The interaction between mothers and health workers also allows opportunities for clarifying misinformation, reinforcing practices such as exclusive breastfeeding and scheduled vaccinations. Almutairi et al. (2021) underscored that paternal involvement in antenatal education significantly contributes to healthier maternal practices. Furthermore, Ditekemena et al. (2020) stressed that

partner support enhances maternal health-seeking behavior, increases compliance with immunization schedules, and improves maternal well-being.

Implications for Practice and Policy

The study highlights the need to strengthen the translation of maternal knowledge into actual caregiving behaviors. While mothers showed good awareness, particularly in immunization and safety, gaps in nutrition and developmental care remain. For health practitioners, this calls for behavior-focused, skill-based education rather than just information sharing. Local health units should adopt the proposed "Alaga ni Nanay" program to promote sustainable caregiving practices. Policies must support training for barangay health workers, culturally appropriate materials, and responsible use of digital health information to ensure consistent maternal guidance.

Study Limitations

The study used purposive sampling, limiting generalizability to all mothers in Canaman or similar settings. Self-reported data may also be subject to social desirability bias, potentially overstating knowledge or practices. Key constructs from Pender's model were not measured quantitatively, which could have provided deeper insight into maternal behavior. Additionally, domains such as hygiene, mental stimulation, and breastfeeding support were not explored in depth. Future research should expand coverage and use more representative sampling and objective observation methods to strengthen findings.

CONCLUSION

This study explored the knowledge and practices of mothers regarding infant care in the coastal barangays of Canaman, Camarines Sur, focusing on nutrition, immunization, safety, and developmental milestones. Findings revealed that while mothers possessed generally high levels of knowledge—especially in immunization and infant safety—their actual caregiving practices showed only moderate alignment, with notable gaps in nutrition and developmental support. The qualitative insights emphasized that maternal behavior is shaped not only by knowledge but also by socio-cultural factors, financial limitations, and personal motivation.

For future research, it is recommended to include a larger and more diverse sample to enhance generalizability and to incorporate additional domains such as hygiene, breastfeeding, and maternal mental health. It would also be valuable to assess the effectiveness of the proposed "Alaga ni Nanay" program once implemented. Researchers should consider using longitudinal designs and integrating standardized behavioral tools aligned with the Health Promotion Model to better understand the factors that sustain or hinder maternal caregiving behaviors.

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