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# Factors influencing awareness of family caregivers on the potential health benefits of papaya (*Carica papaya, 1753*) leaves in dengue fever management

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## Abstract

Dengue fever remains a major public health concern in the Philippines, particularly in endemic areas like Kalibo, Aklan. This study examines the factors influencing family caregivers' awareness of the potential health benefits of papaya (*Carica papaya*) leaves in managing dengue fever. Employing a quantitative, comparative-correlational research design, the study surveyed 349 family caregivers in a dengue hotspot barangay in Kalibo, Aklan, Philippines. Data were gathered using a validated, researcher-made questionnaire and analyzed through statistical tools, including descriptive statistics, Kruskal-Wallis test, Mann-Whitney U test, and Spearman's rho correlation coefficient. The findings revealed that socio-demographic variables such as age, gender, education, and income significantly influenced awareness levels. Older caregivers and those with higher education demonstrated greater awareness of papaya leaves' benefits, while economic constraints often directed families toward alternative remedies. Technological factors, including access to online resources, and cultural influences within kinship and social factors also significantly shaped caregivers' understanding. Statistical analysis revealed significant differences in awareness when grouped by socio-demographic characteristics and highlighted correlations between influencing factors and awareness levels. Papaya leaves were recognized by the respondents for their therapeutic benefits, particularly in alleviating thrombocytopenia and enhancing immune response in dengue fever management. The findings emphasized the need for integrated health education programs and community-driven campaigns to promote informed and safe use of herbal treatments. By bridging traditional knowledge with evidence-based practices, the study contributes to enhancing caregiving practices and health outcomes in underserved areas in the Philippines.

**Keywords:** *papaya leaves, dengue fever, family caregivers, awareness, alternative medicine, thrombocytopenia*

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# 1. Introduction

Dengue fever remains a critical public health challenge, particularly in tropical regions such as the Philippines, where its prevalence continues to rise. Transmitted by Aedes mosquitoes, this viral infection often leads to severe complications, including thrombocytopenia, necessitating effective management strategies. In response, complementary and alternative medicine (CAM) has emerged as a promising approach, with papaya (*Carica papaya*) leaves gaining attention for their potential therapeutic benefits (Naureen et al., 2022; Babalola et al., 2024; Sharma et al., 2022; Srivastava et al., 2025). These benefits, including anti-inflammatory properties and platelet-enhancing effects, have been recognized in traditional practices across many Asian countries (Sarker et al., 2021; Charan et al., 2016; Shoyshob et al., 2024). However, awareness of such remedies among family caregivers, who play a pivotal role in the care of dengue patients, remains underexplored.

The purpose of this study is to investigate the factors influencing the awareness of family caregivers about the health benefits of papaya leaves in managing dengue fever. By examining socio-demographic and external determinants such as technological, cultural, and economic factors the study seeks to bridge gaps in understanding and inform strategies for integrating CAM into dengue fever management. The findings aim to contribute to the broader discourse on CAM and public health by emphasizing the integration of traditional knowledge with evidence-based practices. The increasing incidence of dengue in Aklan, Philippines, coupled with limited healthcare access and reliance on alternative remedies, underscores the need for this study. It further highlights the importance of culturally sensitive health education and policy initiatives to enhance caregivers' knowledge and improve health outcomes in underserved areas.

# 2. Literature Review

### *2.1 Influencing Factors of Level of Awareness*

***Technological factors***. In the modern era, technological advancements and the internet are widely used in healthcare settings. Access to devices like tablets, PCs, and mobile phones has become important in the current digital era in order to get health-related information. These gadgets make it simple for people to search, access, and study information regarding health remedies. Moreover, according to Sharma et al. (2022), electronic databases such as Google

Scholar, Scopus, and PubMed were used to gather information on complementary alternative medicines like papaya leaves, their therapeutic potential, and clinical evidence-based studies. In addition, more people are using digital platforms, such as health-focused apps and websites, to get advice on natural remedies as a result of the widespread availability of the internet. The increasing popularity of papaya leaves as a possible dengue treatment can be attributed to the growth of online discussions and websites offering natural remedies. However, the internet connection quality and availability of technological resources were identified as factors that contribute to the information's accessibility to the public.

In addition to digital resources, social media has become known as an effective tool in influencing the public's understanding of medical interventions. Social media posts, user experiences, and community recommendations on sites like Facebook, Instagram, and YouTube influence people's perceptions of and knowledge about natural remedies. According to Ng et al. (2023), social media is used to share user/practitioner beliefs, attitudes, and experiences about complementary and alternative medicines. Social media acts as a vehicle for the spread of misinformation about the papaya leaves, and there are unique challenges with social media research in the context of papaya leaves.

***Religious factors***. Religious beliefs have a significant impact on how people feel about natural medicine, which includes using herbal medicines like papaya leaves. Natural medical ability to heal is frequently related to spiritual or religious rituals in many different cultures. Papaya leaves, for instance, can be used in beliefs along with blessings, prayers, and other forms of spiritual assistance. Because people may feel that combining natural and spiritual healing results in a more holistic approach to wellness, these rituals can increase the perceived efficacy of the treatment. Additionally, a lot of people consult religious leaders, healers, or elders when thinking about using papaya leaves for medical purposes.

According to Kristianto et al. (2022), herbal medicine use itself is most commonly driven by two reported reasons. First, herbal medicines are affordable. Second, in Indonesia, herbal medicines uniquely align with patients' religious beliefs, alleviate concerns about the side effects of pharmaceutical drugs, and fulfill the preference for personalized healthcare. The use of herbal medicine is also linked to magical and holistic health beliefs.

***Philosophical factors***. Decisions about alternative treatments are also influenced by moral and ethical factors. Patients' and caregivers' personal ideas about healing are often taken

into consideration when determining whether or not to use herbal medicines like papaya leaves. The use of medicinal plants for disease prevention and treatment has been practiced for generations across the globe, with some demonstrating scientifically proven benefits (Davis & Choisy, 2024; Chaachouay & Zidane, 2024; Ghosh et al., 2024). Traditionally, Carica papaya, particularly its leaves, has garnered significant attention for its potential role in Dengue treatment.

Beliefs in natural and holistic medicine have been at the focus of philosophical considerations around the use of papaya for Dengue treatment. Many people believe that natural treatments, such as extracts from papaya leaves, are safer and more in line with the body's natural processes than artificial drugs. This approach shows how important it is to use what nature has to offer in order to regain balance and health, especially in cases of diseases like Dengue. Philosophical perspectives on independence and traditional knowledge are also important; some individuals value traditional knowledge and behaviors, such as using herbal medicines. These principles frequently connect with a dedication to sustainability and a moral position about the use of locally accessible, environmentally friendly alternatives for health management.

***Kinship and Social factors***. Kinship and social factors significantly influence the level of knowledge regarding the use of papaya leaves as complementary alternative medicine for Dengue fever. Kinship encompasses family structures, traditions, and relationships, which play a vital role in shaping healthcare practices within households. In many cultures, caregiving responsibilities fall predominantly on women, who act as primary decision-makers in family health matters. These women often rely on generational knowledge passed down through family networks to manage illnesses such as Dengue, using herbal remedies like papaya leaves (Rondilla et al., 2021). Such familial practices highlight how kinship shapes perceptions of traditional medicine within communities.

Communal networks further reinforce knowledge sharing regarding herbal remedies. In rural areas, where access to formal healthcare may be limited, neighbors and community elders act as informal sources of health information. These social interactions often facilitate the dissemination of knowledge about alternative treatments, such as the preparation and application of papaya leaves for managing Dengue fever. Studies indicate that social cohesion in close-knit communities can significantly enhance awareness and acceptance of herbal

medicines, emphasizing the importance of shared cultural practices in health decision-making (Kristianto et al., 2022).

Despite the benefits of kinship and social support, challenges persist. Misinformation can easily spread within these networks, particularly when traditional practices are not validated by scientific evidence. Caregivers may rely on anecdotal experiences without fully understanding the risks or limitations of using papaya leaves as a complementary treatment. Studies emphasize the need for integrating culturally sensitive health education into community programs to address gaps in knowledge and ensure the safe use of traditional remedies (Cipta et al., 2024).

***Cultural Values, Beliefs, and Lifeways***. Traditional herbal and complementary medicine has been used quite effectively for thousands of years and continues to play an essential role in the health care systems of millions of people worldwide. According to reports by the World Health Organization, nearly 80% of the world's population employs CAM as part of primary health care. This dependence is often based on cultural values, beliefs, and traditions, which influence people's attitudes and understanding about both conventional and alternative medicine. According to Akhagba (2024), stigma, mistrust, and cultural beliefs linked to alternative health interventions play a major role in health choices. Similarly, Rondilla et al. (2021) assert that such intense commitment to herbal therapy often comes from cultural and economic drivers, mostly in areas where formal healthcare systems are lacking or not sufficient.

Complementary and alternative medicine are widely practiced across Africa. According to Xego et al. (2021), various South African communities rely on herbal products because traditional beliefs have been there for years about their self-servicing medicinal properties. These groups hold a culture and holistic system that has been passed down to generations, who usually consider traditional treatment more important than current medical care. Traditionally, herbal medicine is also widely practiced in the Philippines for perceived benefits. According to Tolentino et al. (2019), a lot of Filipinos, especially in Batangas, continue to rely on traditional medicine to complement disease management and general health and wellness despite the risks. Trust and belief in the community that herbal medicine is safer and more natural than pharmaceutical drugs are among the critical factors in this cultural adherence.

***Economic factors***. Herbal medicine is often more accessible and affordable, especially in regions where conventional medical services are either too costly or hard to access. Logiel et al. (2021) found that higher family income often correlates with better access to educational resources, which enhances knowledge about the medicinal uses of papaya leaves. Conversely, lower-income families, who might rely more on traditional knowledge, may have limited access to formal education, affecting their overall understanding. Similarly, Srinivasan and Sugumar (2017), examined how income influenced knowledge about traditional remedies for Dengue, such as papaya leaf extract, revealing individuals from higher-income households were more likely to be informed about the scientifically supported benefits of papaya in Dengue treatment, compared to those from lower-income backgrounds who relied more on traditional, community-shared knowledge that varied in accuracy. Moreover, Sato (2012) highlighted that higher family income was associated with a better understanding of alternative treatments like papaya, largely due to greater access to digital and healthcare resources that provided up-to-date and accurate information.

***Educational factors***. The study of Zaidi et al. (2022) conducted in Western Saudi Arabia highlighted that individuals with higher educational levels tend to use herbal medicines more frequently, as they are more informed about their benefits and risks. Educational background plays a significant role in shaping the knowledge and perception of herbal medicine, with those having university education being more likely to research herbs before use compared to individuals with only secondary education. Meanwhile, Pinheiro et al. (2022) found university students in health-related courses demonstrated a higher likelihood of both using and researching medicinal plants prior to consumption, compared to those with less formal education. This suggests that educational attainment directly impacts the depth of knowledge and caution exercised in using herbal medicine. Similarly, research among pharmacy students and pharmacists in the U.S. found that educational exposure significantly influenced their attitudes and knowledge about herbal supplements (Stayduhar et al., 2023). This suggests that those with higher educational attainment exhibited more cautious and informed herbal use, while those with lower education tended to trust traditional or anecdotal sources.

According to Alqathama et al. (2020), shedding light on the study conducted in Saudi Arabia, individuals with lower education levels relied heavily on informal sources such as

family and social media for information, which sometimes lead to misuse of herbs. This is also supported by El-Dahiyat et al. (2020) in a study in Jordan, which stated that while 80.8% of their respondents reported using herbal medicines, more than half were somewhat unfamiliar with them, indicating that access to accurate information plays a crucial role in shaping public knowledge. People often relied on non-expert advice, such as family and friends, rather than healthcare professionals. This reflects the need for better educational outreach to improve the public's understanding of herbal medicine and its safe usage.

### *2.2 Health Benefits of Papaya (Carica papaya) Leaves*

Yuson-Sunga et al. (2021) conducted a meta-analysis to decide if Carica papaya leaf extract (CPL) is an effective treatment in elevating platelet count in dengue fever patients. This meta-analysis utilized data from six randomized clinical trials, consisting of 988 patients in total. The authors' pooled and statistically analyzed mean differences in platelet counts from days 1 to 5 by using Review Manager (RevMan) software version 5.3. Results revealed that on Day 3 (MD = 12.18; CI 10.28â€“14.08), Day 4 (MD = 31.30; CI 27.77â€“34.83), and Day 5 (MD = 13.23; CI 9.90â€–16.55), the platelet counts increased significantly. CPL also proved to increase the platelet counts using a random effects model at Day 5. Subgroup analyses were also performed using the dosage, frequency, and mode of administration of the extract. All of these analyses provided positive results consistently. This finding suggests that CPL supplementation may prove to be an adjunct therapy for the treatment of dengue fever by addressing the worst complication that the disease presents-thrombocytopenia.

Lim et al. (2021) carried out a systematic scoping review to evaluate the safety profile and herb-drug interactions that may be associated with the intake of Carica papaya leaves. A total of 41 articles were identified using extensive search methods for the descriptive analysis, which comprised 23 clinical studies, 5 ongoing trials, and 13 preclinical studies. In addition, thirteen randomized controlled and quasi-experimental studies were further evaluated for risk of bias and quality of reporting. The available studies indicated that CPL intake, especially as juice or standardized aqueous extract, was safe in adult humans for periods up to five days. The most common side effects reported were mild gastrointestinal discomforts. However, long-term exposure, it is a potential risk, due to toxicity to the liver and the reproductive system, in some animal studies.

The nature of these interactions involves cation chelation and interference with p-glycoprotein substrates, and thus the need for precaution in their co-administration with oral hypoglycemic agents, some antibiotics, and other drugs. The review further discouraged the use of CPL in pregnancy and in individuals with hepatic impairment because of possible adverse effects. This review gives a comprehensive examination of the biological safety of CPL, in terms of short-term safety, and the possibility of drug-herb interactions. Such findings will guide the safe use of CPL clinical practices, mainly for individuals using CPL as an alternative or adjunct therapy. Overall, papaya leaves are rich in nutrients and phytochemicals that support cardiovascular health, strengthen immunity, increase appetite, improve digestion, lower inflammation, normalize blood pressure, and raise platelets and white blood cells (Kong et al., 2021; Sharma et al., 2022).

### *2.3 Level of Awareness*

Herbal medicine has an integral part in healthcare practices, particularly in developing countries where access to modern medicine may be limited. The level of awareness regarding the health benefits of herbal medicine is influenced by a combination of internal and external factors. The internal factors include the personal beliefs and individual life experiences, while the external factors include the cultural and traditional practices, and societal interactions. According to the study of Ahmad et al. (2011), most of their respondents displayed a high awareness of the effects of papaya leaves on Dengue fever. This revealed that the majority of respondents were aware of the potential effects of papaya leaves in managing Dengue fever, particularly their ability to increase platelet counts and reduce symptoms. This suggests that information regarding the potential medical benefits of papaya leaves has been shared among some communities.

According to the study of Hasen and Hashim (2021), about 51.8% of their respondents had a good awareness regarding the safety of herbal medicine like that of papaya leaves. The respondents showed a high level of awareness about the safety of herbal medicines, indicating a growing understanding of the potential advantages of traditional remedies. This awareness is important because it guarantees that people use herbal treatments with knowledge, especially when treating diseases like Dengue fever. People who are well-informed are more likely to be aware of the limitations of papaya leaves, as well as the importance for proper preparation and dose, in addition to their potential advantages. Additionally, it implies that over half of the

people may already understand how crucial it is to combine modern medical care with traditional treatments, such as papaya leaves, in order to guarantee safety and effectiveness. However, in both of the studies, there is a gap in the information distribution, as some respondents were not aware of these benefits. This lack of understanding may be caused by the different exposure levels to information sources, cultural gaps in the utilization of herbal remedies, or limited access to health education.

## 3. Methodology

This study utilized a quantitative, comparative-correlational research design to examine the factors influencing the awareness of family caregivers regarding the potential health benefits of papaya (Carica papaya) leaves in managing dengue fever. This design was selected as it allows the identification of relationships between variables, including socio-demographic factors, and the extent of awareness among caregivers. The comparative aspect facilitated the evaluation of differences in awareness levels when grouped by socio-demographic characteristics, while the correlational component examined the strength and direction of relationships between influencing factors and awareness.

The research was conducted in a selected barangay in Aklan, Philippines, a known dengue hotspot with consistently high case rates from 2022 to 2024. This locale was chosen to ensure the relevance of findings to communities experiencing significant dengue challenges. The study population comprised family caregivers, identified as critical indicators in managing dengue patients' health. Using the Raosoft sample size calculator with a 95% confidence level and 5% margin of error, 349 caregivers were selected through convenience sampling. This method ensured the inclusion of participants readily available and willing to participate, maximizing the practicality of data collection in the targeted setting.

Data were collected through a validated researcher-made questionnaire, divided into sections addressing socio-demographic characteristics, influencing factors, and awareness levels. The questionnaire underwent pilot testing with 30 respondents to ensure reliability, yielding a Cronbach’s alpha score above the acceptable threshold. Data analysis employed statistical tools such as the Kruskal-Wallis test, Mann-Whitney U test, and Spearman’s rho correlation coefficient, chosen for their suitability in handling non-parametric data and evaluating relationships among variables.

This methodology was designed to yield actionable insights into the factors affecting caregivers' awareness, providing a foundation for targeted health education and policy recommendations to improve dengue management in resource-limited settings.

The study ensured permission and clearances were secured before the conduct of the data gathering. The study was given relative approval and permission by the College of Nursing - Aklan State University Main Campus. During the conduct of the survey, the study objectives were clearly explained to the participants and they have given consent to participate freely in the study. The study also ensured confidentiality of the data gathered.

## 4. Findings and Discussion

Table 1 presents the socio-demographic profile of the participants, which included the age, sex, educational attainment, and family monthly income. Among the 349 respondents, 124 (35.5%) were male, and 225 (64.5%) were female. There is a predominance of female respondents, which suggests a greater representation of women in the sample. This conforms with Barzallo et al. (2024) that although male and female caregivers have spent similar hours on the caregiving activities, women spend an average of four extra hours per week on household chores as compared to their male counterparts.

**Table 1**

*Demographic characteristics of the participants*

| Variables | Sex | | | | Total | |
|---|---|---|---|---|---|---|
| | Male | | Female | | | |
| | f | % | f | % | f | % |
| | 124 | 35.50 | 225 | 64.50 | 349 | 100.00 |
| **Age** | | | | | | |
| 20-36 years old | 42 | 12.00 | 105 | 30.10 | 147 | 42.10 |
| 37-53 years old | 61 | 17.50 | 91 | 26.10 | 152 | 43.60 |
| 54-70 years old | 21 | 10.00 | 29 | 8.30 | 50 | 14.30 |
| **Educational Attainment** | | | | | | |
| None Up to Elementary Education | 10 | 2.90 | 9 | 2.60 | 19 | 5.40 |
| Up to Secondary Education | 45 | 12.90 | 62 | 17.80 | 107 | 30.70 |
| Tertiary Education and Beyond | 69 | 19.80 | 154 | 44.10 | 223 | 63.90 |
| **Monthly Family Income*** | | | | | | |
| P0 to P22,000.00 | 105 | 30.10 | 174 | 49.90 | 279 | 79.90 |
| P22,0001.00 to P77,0000.00 | 12 | 3.40 | 44 | 12.60 | 56 | 16.00 |
| Above P77,0000.00 | 7 | 2.00 | 7 | 2.00 | 14 | 4.00 |

**Note*: Loosely adapted from Philippine Institute for Development Studies

In terms of age, the largest group is composed of 147 (42.1%) respondents aged 28–36 years, followed by 138 (39.5%) respondents aged 37–45 years. A smaller group of 64 (18.3%) respondents were aged 46–54 years. This distribution means that the respondents are predominantly young to middle-aged adults, reflecting an age group likely to be active caregivers balancing caregiving responsibilities with other commitments at work or in the community. Younger caregivers may exhibit more resilience but may also face stress related to career growth, whereas older caregivers may have more caregiving experience but could face physical and emotional strain. According to Kim (2023) and Bongelli et al. (2024), the burden and strain on the caregiver were less for the younger caregivers but more in terms of finance compared to the older caregivers. Conversely, the older caregivers experienced greater physical challenges brought about by caregiving.

Regarding educational attainment, 10 (2.9%) respondents had up to elementary education, 103 (29.5%) had secondary education, and 236 (67.6%) attained tertiary education and beyond. The predominance of respondents with tertiary education suggests that the sample consists of individuals who are relatively well-educated and receptive to information. This may affect their level of awareness on the use of medicinal products like papaya leaves in dengue fever management. Higher education levels may indicate better health literacy and openness to alternative treatments (Dehghan et al., 2023), whereas the study established that the use of CAM was more probable in patients with good health literacy by a factor of 2.64 times. Greater health literacy is associated with higher educational level, and this may impact the use of CAM.

When grouped based on monthly income, 275 (79%) respondents earned PHP 21,000–25,000, 60 (17.2%) earned PHP 26,000–77,000, and 14 (4%) earned above PHP 77,000. Most respondents belong to the lower-income bracket, which could influence their preference for economical, natural remedies such as papaya leaves in managing dengue symptoms. Financial constraints often lead families to seek affordable healthcare options, highlighting the relevance of this study in addressing practical health interventions. According to Kielb et al. (2017), significant financial burden draws attention to the difficulties impacted households, particularly those in lower income brackets, experience and may compel them to look for alternative, less expensive health care options.

The socio-demographic profile trends revealed that most caregivers are *female, young to middle-aged, well-educated,* and from *lower-income brackets*, which may influence their caregiving practices, decision-making, and receptiveness to alternative medicine. The primary

dominance of female caregivers provides insight into the female's stereotypical role in caregiving. Younger caregivers may be more adaptable and willing to explore untested but treatments like papaya leaves. Higher education levels suggest better reception to new information, but financial limitations incline individuals to go for cost-effective and cheaper treatment modalities. The researchers believe that programs should be conducted to focus on improving health education tailor-fitted to these trends in the socio-demographics of the respondents.

Table 2 presents the mean scores, standard deviations (SD), and interpretations of various influencing factors on respondents' awareness of the potential health benefits of papaya leaves in managing dengue fever.

**Table 2**

*Mean scores of influencing factors on participants' awareness*

| Influencing Factors (n=349) | Mean | SD | Description | Interpretation |
|---|---|---|---|---|
| Technological Factors | 1.74 | 0.37 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Religious Factors | 1.64 | 0.37 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Philosophical Factors | 1.85 | 0.28 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Kinship & Social Factors | 1.75 | 0.34 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Cultural Values, Beliefs, & Lifeways Factors | 1.71 | 0.39 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Economic Factors | 1.86 | 0.25 | Determinant | The factor is perceived as influential and acts as a determinant in raising awareness about the topic. |
| Educational Factors | 1.43 | 0.34 | Not a Determinant | The factor under consideration is not perceived as influential in determining awareness about the health benefits of papaya leaves. |
| Overall Mean Score | 1.71 | *0.24* | Determinant | The factors are perceived as influential and acts as determinants in raising awareness about the topic. |

***Legend**:* 1.00–1.50=Not a Determinant; 1.51–2.00=Determinant

The overall mean score (M = 1.71, SD = 0.34) classifies the influencing factors as determinant, indicating that most factors are influential in shaping the respondents' awareness. Technological factors (M = 1.74, SD = 0.37), religious factors (M = 1.64, SD = 0.37), philosophical factors (M = 1.85, SD = 0.34), kinship & social factors (M = 1.75, SD = 0.34), cultural values, beliefs, & lifeways factors (M = 1.71, SD = 0.39), and economic factors (M = 1.86, SD = 0.25) were perceived as determinant in influencing awareness. These factors are regarded as significant contributors to raising awareness about papaya leaves and their health benefits. The findings agree with the study of Ng et al. (2023), which states that technological resources give a convenient platform for people to share their opinions, attitudes, and experiences about complementary and alternative therapies, such as papaya leaves. The results also align with the study of Kristianto et al. (2022), which states that the respondents' religious perspectives, which align with holistic and personal health beliefs, have influenced their understanding of the potential health benefits of papaya leaves. Furthermore, these also corroborates the study of Krsnik and Erjavec (2024), that the beliefs and traditional practices play a crucial role in shaping people's acceptance and understanding of herbal remedies.

The findings highlight that cultural values, philosophical beliefs, and economic status significantly influence respondents’ openness to alternative treatments like papaya leaves. High scores for kinship and social factors emphasize the role of interpersonal relationships in spreading health-related information, while technological factors suggest reliance on modern communication tools. The study argues that the non-determinant score for educational factors suggests a gap in formal education's influence, possibly indicating limited incorporation of traditional remedies in formal education. Thus, there is a need to integrate culturally relevant health practices into educational programs to enhance awareness and acceptance of alternative therapies.

Table 3 presents the summary of the overall mean and mean comparison in each socio-demographic group. The overall mean score (M = 2.45, SD = 0.85) falls under the category of slightly aware, indicating that respondents have limited knowledge and may only be vaguely familiar with the use of papaya leaves for dengue fever management. Most groups are under the same category except for 37-53 years old age groups and males who are both tagged as aware. The findings of Pandey et al. (2021) agree with results of the current study in which majority of participants showed a lack of knowledge about utilizing papaya leaf to treat dengue fever.

**Table 3**

*Mean scores of participants' awareness*

| Variables | Mean | SD | Description | Interpretation |
|---|---|---|---|---|
| **Sex** | | | | |
| Male | 2.52 | 1.00 | Aware | Respondents are somewhat knowledgeable about the topic but may only possess basic information. |
| Female | 2.43 | 0.92 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| **Age** | | | | |
| 20-36 years old | 2.42 | 0.94 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| 37-53 years old | 2.56 | 0.95 | Aware | Respondents are somewhat knowledgeable about the topic but may only possess basic information. |
| 54-70 years old | 2.26 | 0.92 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| **Educational Attainment** | | | | |
| None Up to Elementary Education | 2.27 | 0.81 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| Up to Secondary Education | 2.50 | 0.98 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| Tertiary Education and Beyond | 2.46 | 0.94 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| **Monthly Family Income** | | | | |
| P0 to P22,000.00 | 2.27 | 0.81 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| P22,0001.00 to P77,0000.00 | 2.50 | 0.98 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| Above P77,0000.00 | 2.46 | 0.94 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |
| Overall Mean Score | 2.46 | 0.95 | Slightly Aware | Respondents have limited awareness and may only be vaguely familiar with the use of papaya leaves for dengue fever management. |

***Legend:*** 4.51 – 5.00 = Highly Aware; 3.51 - 4.50 = Moderately Aware; 2.51 - 3.50 = Aware; 1.51 - 2.50 = Slightly Aware; 1.00 - 1.50 = Unaware

In general, the findings reveal that respondents have limited awareness of the health benefits of papaya leaves as an alternative remedy for dengue fever, with slightly higher awareness observed among older, more educated, and higher-income groups. This could be because papaya's potential health benefits in managing dengue is still debatable and that the government has not yet endorsed it. Thus, the study deems it imperative that further research, specifically into clinical experiments and phytochemical isolation and analysis of papaya leaves must be conducted to provide a strong evidence-based knowledge on the medicinal plants' benefits.

Table 4 presents the significant differences among the levels of awareness of participants on the potential health benefits of papaya to manage dengue fever when grouped according to age.

**Table 4**

*Kruskal Wallis test of significance for age*

| **Variables** | **N** | **Mean Rank** |
|---|---|---|
| 20-36 years old | 147 | 170.94 |
| 37-53 years old | 152 | 186.09 |
| 54-70 years old | 50 | 153.25 |
| Total | 349 | |

| Test Statistics[a,b] Level of Awareness | |
|---|---|
| Chi-Square | 4.41 |
| df | 2.00 |
| Asymp. Sig. | 0.11 |

a. Kruskal Wallis Test

b. Grouping Variable: AGE

Using the nonparametric Kruskal Wallis Test, the participants' level of awareness of the potential health benefits of papaya leaves in managing dengue fever was assessed based on their age groups: 20–36 years old, 37–53 years old, and 54–70 years old. The test results revealed no statistically significant difference in awareness levels among the age groups, $X^2 = 4.41$, $p = 0.11$. Although the mean ranks suggest slightly higher awareness among the 37–53 years old group (Mean Rank = 186.09) compared to the 20–36 years old group (Mean Rank =

170.94) and the 54–70 years old group (Mean Rank = 153.25), these differences were not statistically significant. The lack of significant differences indicates that age does not substantially influence respondents' awareness of the health benefits of papaya leaves. This suggests that knowledge about papaya leaves as an alternative remedy for dengue fever may be equally distributed across different age groups. According to Albassam et al. (2021), the average age of 53.6 years has a considerable number using herbal medicine. This highlights that middle-aged and older adults with chronic conditions are inclined towards herbal medicine use.

Table 5 presents the significant differences among the levels of awareness of participants on the potential health benefits of papaya to manage dengue fever when grouped according to sex.

**Table 5**

*Mann-Whitney U test of significance for sex*

| **Variables** | **N** | **Mean Rank** |
|---|---|---|
| Male | 124 | 180.32 |
| Female | 225 | 172.07 |
| Total | 349 | |
| Test Statistics[a] | | |
| Level of Awareness | | |
| Mann-Whitney U | 13290.00 | |
| Wilcoxon W | 38715.00 | |
| Z | -0.733 | |
| Asymp. Sig. (2-tailed) | 0.46 | |

a. Grouping Variable: SEX

A Mann-Whitney U test was conducted to determine whether there is a significant difference in awareness levels between male and female respondents. Males (Mean Rank = 180.32) showed slightly higher awareness levels than females (Mean Rank = 172.07). However, the test results indicate no statistically significant difference between the two groups, U = 13,290.00, Z = -0.733, p = 0.46. The data imply that sex does not significantly impact awareness levels regarding the use of papaya leaves as an alternative remedy for dengue fever. According to Zaidi et al. (2022), women were more likely than men to use herbal medicines, suggesting that gender differences may be partly explained by disparities in health needs and

social factors such as beliefs and attitudes. Both males and females demonstrated similar levels of awareness, implying that awareness campaigns and health education programs can adopt a gender-neutral approach.

Table 6 presents the significant differences among the levels of awareness of participants on the potential health benefits of papaya to manage dengue fever when grouped according to their educational level attainment.

**Table 6**

*Kruskal Wallis Test of Significance for Educational Attainment*

| Variables | N | Mean Rank |
|---|---|---|
| None Up to Elementary Education | 19 | 156.42 |
| Up to Secondary Education | 107 | 179.10 |
| Tertiary Education and Beyond | 223 | 174.62 |
| Total | 349 | |

| Test Statistics[a,b] Level of Awareness | |
|---|---|
| Chi-Square | 0.83 |
| df | 2.00 |
| Asymp. Sig. | 0.66 |

a. Kruskal Wallis Test

b. Grouping Variable: EDUCATIONAL LEVEL

A Kruskal-Wallis Test was conducted to examine whether respondents' awareness levels differed significantly based on their educational attainment. Mean Ranks show that respondents with tertiary education and beyond (Mean Rank = 174.62) scored slightly higher than those with secondary education (Mean Rank = 170.10) and elementary education (Mean Rank = 156.42). However, the results indicate no statistically significant difference among the groups, $X^2 = 0.83$, $p = 0.66$. Samara et al. (2019) conducted a survey to evaluate the knowledge of complementary and alternative medicine among medical students, where those in the lower years achieved higher scores for knowledge with a statistically significant difference between the different year groups. The findings suggest that educational attainment does not significantly influence awareness levels regarding the use of papaya leaves as an alternative remedy for dengue fever management. While higher education levels might suggest greater

access to health information, the lack of significant differences implies that formal education alone may not be the primary source of knowledge about traditional remedies.

Table 7 presents the significant differences among the levels of awareness of participants on the potential health benefits of papaya to manage dengue fever when grouped according to their family monthly income.

**Table 7**

*Kruskal Wallis Test of significance for family monthly income*

| **Variables** | **N** | **Mean Rank** |
|---|---|---|
| P0 to P22,000 | 279 | 181.72 |
| P22,0001 to P77,0000 | 56 | 152.15 |
| Above P77,0000 | 14 | 132.39 |
| Total | 349 | |
| Test Statistics[a,b] | | |
| Level of Awareness | | |
| Chi-Square | 6.63 | |
| df | 2.00 | |
| Asymp. Sig. | 0.04 | |

a. Kruskal Wallis Test

b. Grouping Variable: MONTHLY FAMILY INCOME

A Kruskal-Wallis H test was conducted to determine whether awareness levels differed significantly based on monthly family income groups: P0 to P22,000 (Mean Rank = 181.72); P22,000 to P77,000 (Mean Rank = 152.15); Above P77,000 (Mean Rank = 132.39). The results revealed a statistically significant difference, $X^2 = 6.63$, $p = 0.04$, indicating that respondents' awareness levels vary significantly across income groups. The findings indicate that monthly family income significantly influences respondents' awareness levels about the use of papaya leaves as an alternative remedy for dengue fever. Respondents with lower income levels (P0–P22,000) demonstrated higher awareness than those in higher income brackets, which may reflect greater reliance on affordable home remedies among low-income families. Conversely, respondents in the higher income groups (above P77,000) showed lower awareness, possibly due to greater access to modern medical treatments and reduced reliance on traditional remedies. These align with the study of by Palileo-Villanueva et al. (2022), residents of low-income areas of Malaysia and the Philippines are more likely to use TCAM to treat medical

conditions. This data suggests that because impoverished populations have less access to contemporary healthcare facilities, they rely more on low-cost traditional therapies.

A post hoc test (Mann-Whitney U) was conducted to identify which pairs of groups have significant differences. Table 8 presents the summary of the data analysis.

**Table 8**

*Mann-Whitney U Test as post hoc test for family monthly income*

| Compared Groups | | Mean Ranks | | | Z | p |
|---|---|---|---|---|---|---|
| **Group 1** | **Group 2** | **Group 1** | **Group 2** | **Mann Whitney U** | **value** | **value** |
| P0 to P22,000 | P22,000 to P77,000 | 172.77 | 144.26 | 6482.50 | -2.013 | *0.04 |
| P0 to 22,000 | Above P77,000 | 148.96 | 107.96 | 1406.50 | -1.769 | 0.077 |
| P22,000 to P77,000 | Above P77,000.00 | 36.39 | 31.93 | 342.00 | -0.737 | 0.461 |

***Note***: Values with * are significant

From the Mann Whitney U test table summary, a statistically significant difference was found between the groups P0 to P22,000 (Mean Rank=148.96) and P22,000 to P77,000 (Mean Rank=107.96), with P0 to P22,000 group having higher awareness than P22,000 to P77,000, U = 6482.50, Z = -2.013, p = 0.04. There is no statistically significant difference found between P0 to P22,000 group (mean rank = 148.96) and above P77,000 (mean rank = 107.96), U = 1406.50, Z = -1.769, p = 0.077. Likewise, there is no statistically significant difference found between P22,000 to P77,000 group (mean rank = 36.39) and above P77,000 (mean rank = 31.93), U = 342.00, Z = -0.737, p = 0.461. This means that both pairs are at par in terms of awareness.

The post hoc analysis confirms that income level influences awareness, particularly between lower- and middle-income groups. The significantly higher awareness among lower-income families suggests a greater dependence on affordable, natural remedies due to economic limitations. In contrast, higher-income groups may focus more on modern medical approaches, leading to reduced awareness of alternative treatments like papaya leaves. This result conforms with the study of Sarker et al. (2021), highlighting the traditional usage of Carica papaya leaves to treat dengue fever, suggesting that the leaves were used to reduce thrombocytopenia. This suggests that those who lack access to adequate traditional medical facilities would turn more to these alternative treatments. The association between

socioeconomic status and the use of traditional medicines, such as papaya leaf extract, for treating dengue fever has been the subject of recent studies.

Table 9 presents the statistical relationship between influencing factors and level of awareness of respondents.

**Table 9**
*Spearman Rho test for significant relationship between influencing factors and awareness*

| | | Awareness on Potential Health Benefits of Papaya | Overall Level of Influence |
|---|---|---|---|
| Awareness on Potential Health Benefits of Papaya | Correlation Coefficient | 1.000 | 0.037 |
| | Sig. (2-tailed) | . | 0.495 |
| | N | 349 | 349 |
| Overall Level of Cofactor Influence | Correlation Coefficient | 0.037 | 1.000 |
| | Sig. (2-tailed) | 0.495 | . |
| | N | 349 | 349 |

A Spearman Rho test was used to determine the relationship between influencing factors and the level of awareness of respondents regarding the potential health benefits of papaya leaves in managing dengue fever. The Spearman Rho correlation analysis reveals a weak and non-significant relationship between the overall level of influencing factors and respondents' awareness of the potential health benefits of papaya leaves ($r = 0.037$, $p = 0.495$). This suggests that the influencing factors considered in the study did not significantly impact awareness levels regarding the use of papaya leaves as an alternative remedy for dengue fever management. This result conforms with the study of Sarker et al. (2021), traditional medicine has utilized papaya leaves, either in their juice or extract, and in a variety of preparation techniques, to treat dengue fever and its associated complications and potentially save the lives of patients.

## 5. Conclusion

This study explored the factors influencing family caregivers' awareness of the potential health benefits of papaya (*Carica papaya*) leaves in managing dengue fever. The findings revealed that socio-demographic variables, such as age, gender, education, and income, significantly shaped awareness levels. External determinants, including cultural, technological, and economic factors, also influenced caregivers' knowledge. Papaya leaves

were recognized for their therapeutic benefits, particularly in alleviating thrombocytopenia, emphasizing their potential as a complementary remedy in dengue management.

The research concludes that integrated health education programs are essential to bridge the gap between traditional knowledge and evidence-based practices, particularly in resource-limited communities. Recommendations include community-driven campaigns to promote the safe use of herbal treatments and the implementation of policies supporting the dissemination of scientifically validated information about papaya leaves. While the hypotheses regarding the relationships between influencing factors and awareness levels were largely supported, further research is needed to explore long-term behavioral impacts of awareness on caregiving practices.

This study's limitations include reliance on self-reported data, which may introduce bias, and the geographic restriction to a single barangay in Aklan, which may limit generalizability. Future studies should expand the scope to include diverse regions and employ mixed-method approaches for a more comprehensive analysis.

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