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Malaria Cases in Southern Palawan: Implications for Enhancing Local Prevention and Programs

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Abstract

Bautista, S. Q. **"Malaria Cases in Southern Palawan: Implications for Enhancing Local Prevention and Programs"**

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Malaria remains a significant public health challenge in Southern Palawan, characterized by fluctuating incidence rates and diverse transmission dynamics. Indeed, there is still an increase of cases in Southern Palawan and some have deficit knowledge about malaria. This study determined the malaria cases in Southern Palawan which are limited to the municipality of Bataraza and assessed the effectiveness of existing local prevention and program strategies. Specifically, it explored how demographic factors influence the level of knowledge and the level of perception on malaria. Using a descriptive quantitative research design, 300 random selected people from the three barangays in Bataraza in Southern Palawan participated in the study. The researcher adopted a questionnaire, based on Journal of Family Medicine and Primary Care, and measured on a 5-point Likert scale, gathered data on demographics and self-assessed competence. Descriptive statistics and chi-square test were utilized for data analysis. Result showed that participants were mostly young adults aged 20 to 25 which correlates with greater involvement in health education initiatives. Additionally, a nearly balanced gender distribution suggests that female respondents may play a significant role in health discussions and community engagement. The ethnicity of Palaw-an and Tagalog groups are culturally sensitive health interventions that enhance malaria awareness. With only elementary and secondary education raising concerns about their health literacy regarding malaria. Those who are employed generally have better access to health resources underscoring the necessity for interventions aimed at unemployed individuals. This evaluates that respondents' knowledge of malaria revealing its high awareness of its causes and symptoms, while indicating a moderate understanding of transmission dynamics prevention strategies. These findings suggest a solid foundation of knowledge with opportunities for improvement in specific areas, particularly community-level interventions. The respondents also exhibit a high perception of malaria prevention practices understanding of its public health impact, reflecting active engagement in preventive behaviors. Overall, the findings underscore need to reinforce existing knowledge, address misconceptions and promote health seeking-behaviors to improve malaria awareness and prevention in the community.

Keywords: Malaria, Health Education, Community-level Interventions

Chapter I
INTRODUCTION

This chapter presents the background of the study, statements of the problem, significance of the study, scope and delimitation, and definition of terms.

Background of the Study

Malaria is found in over 90 countries, with the World Health Organization (WHO) expecting 241 million cases in 2020. Sub-Saharan Africa suffers most, especially under-5s. Malaria has a major influence on productivity, healthcare, and development in endemic locations. In many Asian countries, malaria affects millions of people and hinders health and economic growth. Geography, climate, and socioeconomic variables affect malaria across the continent. Southeast Asian nations including Myanmar, Thailand, Vietnam, and Indonesia have malaria. The most frequent Plasmodium species in the region are falciparum and vivax. Monsoons provide Anopheles mosquito breeding sites, affecting transmission dynamics.

Malaria can be fatal from female Anopheles mosquitoes carrying Plasmodium parasites. This infectious disease is a serious public health threat in tropical and subtropical mosquito and parasite occupied areas. Plasmodium falciparum, vivax, malariae, and ovale are the most prevalent and medically important kind. Most malaria deaths are caused by P. falciparum and the deadliest one. It can cause cerebral malaria, organ failure, and anemia. P. vivax produces less severe symptoms, but it can remain latent in the liver and induce recurrences after the first infection. Other species contribute greatly to malaria despite their low numbers. Malaria symptoms occur 10 to 15 days later. The common symptoms include fever, chills, headache, nausea, vomiting, muscle pain, and exhaustion. Emergency care is needed for serious diseases that spread fast. Most malaria cases are spread by mosquitoes. However, blood transfusions, organ transplants, and needle sharing can spread it as well. Comprehensive public health strategies that prioritize vector management and safe medical practices are needed due to the transmission pathway.

Globally, there are 249 million cases of malaria with 608,000 deaths in 2022 according to Montemayor (2024). Latest data from the Department of Health (DOH) in the Philippines showed that about 6,248 cases were recorded in 2023 and 90% higher than the 3,245 cases posted in 2022. Palawan remains the only province with active cases. It reported a total of 6,188 malaria cases last year. Plasmodium falciparum and vivax cause most Philippine malaria. Mindanao, Luzon, and the Visayas, where Anopheles mosquitoes proliferate, had greater cases. Seasonal rain increases mosquito breeding and transmission. In distant Western Visayas locations, Palawan's thick woodlands and tropical temperature are ideal for malaria-carrying mosquitoes. Malaria persists in Palawan despite substantial management and eradication efforts. Contributing to the continuous transmission, especially in endemic regions, are factors such as restricted healthcare access, fragmented healthcare delivery systems, and environmental changes. The sickness disproportionately affects indigenous people, migrant laborers, and forest and border residents, creating health inequalities in the province. Palawan, the westernmost Philippine province, has long suffered from Plasmodium-borne malaria affecting several municipalities of South Palawan including Quezon, Rizal, Brookes Point and Bataraza. Each of these areas experiences unique challenges related to malaria transmission, largely due to their geographic and environmental characteristics. Rizal and Quezon grapple with malaria linked to rural settings, where awareness and preventive measures are often inadequate. For instance, Brooke’s Point and Bataraza has reported cases primarily in remote communities with limited healthcare access, also Bataraza sees seasonal spikes in infections, particularly during the rainy season when mosquito breeding increases. Comprehensive public health initiatives, including health

education, distribution of insecticide-treated bed nets, and improved access to treatment are crucial to mitigating the impact of malaria in these municipalities and enhancing community resilience against the disease.

Analyzing the level of knowledge and perception toward malaria among locals is crucial for customizing and improving local initiatives to prevent and manage the disease. The objective of this study was to evaluate the present degree of knowledge and comprehension of malaria among randomly selected inhabitants of the Southern Palawan. The researcher has encountered and experienced a gap in knowledge and perception regarding malaria is significant, impacting prevention and treatment efforts like while many people are aware that malaria is a mosquito-borne disease, misconceptions persist about its transmission, symptoms and treatment. For instance, some individuals believe that malaria is only a concern in rural areas, ignoring the risk in cities. Cultural beliefs can only make people hesitant to seek medical help or use preventive measures like bed nets and medications. This difference between what scientists know and what the public believes makes it harder to fight malaria. To improve health outcomes, it's important to educate communities about the disease and its prevention. The proponent aims to explore several potential research gaps: 1) As a researcher, there is still a need to explore how cultural beliefs influence the understanding and perception of malaria across different communities which can impact health-seeking behavior. 2) The effectiveness of educational programs at increasing awareness about malaria conducted from the RHU have been implemented but there is still a need for rigorous evaluations to assess their impact on knowledge and behavior change. 3) There is a need to understand the behavioral insight and factors influencing individuals to seek medical care upon experiencing malaria symptoms. 4) There is limited research on how nurses and other healthcare providers contribute to assessing the knowledge and perceptions of individuals in a community. The effectiveness of assessing the level of knowledge and perception on malaria can develop effective public health interventions and can contribute to more effective malaria control strategies. 5) Many studies focus on malaria treatment and other factors, such as individual knowledge and perception, are often under-explored; a gap exists in how community-specific interventions can lower the population risk in the community.

The present study was inspired by the following reasons: Firstly, to address critical gaps in understanding community knowledge and perceptions of malaria, which are essential for effective public health interventions. Secondly, by gaining this insight into how different populations perceive the disease and misconceptions that exist, the researcher could develop educational programs and strategies that resonate with community beliefs. Lastly, the research aimed to improve malaria prevention and treatment efforts, reduce transmission rates, and enhance overall health outcomes of communities through a survey.

Statement of the Problem

This research study titled "Malaria Cases in Southern Palawan: Implications for Enhancing Local Prevention and Programs," aimed to determine the current understanding and attitudes of the local population regarding malaria transmission, prevention, and treatment.

In particular, this research responded to the following queries:

1. What is the profile of the respondents in terms of:

a. Age,
b. Sex,
c. Ethnicity,
d. Educational Attainment, and

e. Occupation?
2. What are the respondents' level of knowledge on malaria in terms of:
a. Causes,
b. Signs and Symptoms,
c. Mode of Transmission,
d. Prevention, and
e. Treatment?
3. What is the respondent's level of perception of malaria in terms of:
a. Health-seeking behavior,
b. Beliefs,
c. Public health impact, and
d. Practices?
4. Is there a relationship between the demographic profile and the level of knowledge on malaria, particularly in terms of factors?
5. Is there a relationship between the demographic profile and the level of perceptions on malaria?
6. What program can be proposed based on the results of the study?

Significance of the Study

The significance of the study presents and outlines its importance and potential impact on the society as a whole. The result of the study would benefit the following**:**

Department of Health (DOH). The result of this study could determine the effectiveness of the malaria awareness programs in relation to the residence knowledge and perception concerning the disease. This research would also be able to provide them with the idea whether the residence is responding positively or negatively to malaria awareness programs.

Local Government Unit (LGU). The result would help them effectively implement and provide prevention campaigns, health education programs, community interventions, and formulate seminars as well as forums relevant to increase awareness, knowledge, and perception concerning malaria.

Community. The results would help community education be developed to raise awareness about malaria symptoms and prevention, and empower individuals to take proactive measures against the disease.

Healthcare providers. The results would help them conduct public health awareness, health teachings to families and communities regarding the ways to prevent malaria disease.

Patients. The results would have the potential to directly improve patient outcomes through better treatments, prevention strategies and healthcare policies ultimately reducing the burden of malaria.

Readers and future researchers. This study would provide valuable reference and baseline data in undertaking future research regarding malaria and the result would provide them with factual data of communities in the Municipality of Bataraza.

Scope and Delimitation

This study focused on determining the knowledge and perception regarding malaria and the sources of information of malaria in which the respondents obtained. The study's respondents were the residents of Southern Palawan. An overall number of 300 people, aged 18 and above were randomly selected for interviews and surveys. The study used quantitative surveys. Data on the patient's profile including age, sex, ethnicity, educational attainment, and occupation, level of knowledge in terms of causes, signs and

symptoms, transmission, prevention and treatment, and perception of malaria in terms of health-seeking behavior, beliefs, public health impact, and practices were collected through surveys.

Finally, a strategy for developing a program to enhance local malaria control and prevention was designed to address the malaria cases in Southeast Palawan. This research was conducted within a specific timeframe, from the second semester of the school year 2025. Historical data on malaria prevalence was not included. The respondents were from Southern Palawan limited to the Municipality of Bataraza only using stratified sampling.

Definition of Terms

The following terms are theoretically and operationally defined to understand this study better.

Age. This is a measure of the duration of time since an individual was born. Operationally defined as a quantifiable measure that can be assessed in specific terms for research.

Assessing. This is a systematic process of evaluating, measuring, appraising an individual's knowledge, skills, abilities or performance against established criteria or standards. Operationally, this refers to the specific methods and processes used to carry out evaluation in practice.

Beliefs. These are mental representations or convictions that individuals hold to be true or valid. Operationally defined through observable behaviors and self-reported measures that indicate what individuals hold to be true.

Causes. These refer to the factors that bring about an effector result. Operationally defined through measurable and observable indicators that can be identified and analyzed.

Control. This emphasizes the overarching concept of regulation and guidance. Operationally, this refers to the specific methods used to implement and maintain regulatory measures in practice.

Demographics. These are statistical characteristics of a population that can influence health outcomes and behaviors. Operationally defined, the data were collected through survey form asking participants to provide their age, gender, highest education completed, and household income range.

Educational Attainment. This refers to the highest level of education an individual has completed. Operationally, it is measured through specific indicators and data collection methods.

Enhance. This pertains to the process of improving or augmenting quality, value, or effectiveness of something. Operationally, this refers to the specific methods and actions taken to achieve improvement in a given context.

Ethnicity. This refers to a shared cultural identity that is based on various factors. Operationally defined through observable and measurable characteristics that individuals may identify with.

Healthcare. This refers to the organized provision of medical services and support aimed at maintaining or improving health.

Health-seeking Behavior. This refers to the actions individuals take to maintain or improve their health. Operationally defined through measurable actions and indicators that reflect individuals' engagement with health services.

Implication. This is defined as a relationship connection between two concepts where one suggests or indicates the possibility of the other. Operationally, this refers to the specific processes and considerations used to identify and analyze the consequence of a particular action.

Knowledge. This is the information and understanding that individuals have regarding malaria, including its causes, symptoms, transmission methods, prevention strategies, and treatment options. This is

operationally defined as knowledge assessed using a questionnaire where correct answers indicated adequate knowledge while incorrect signified inadequate knowledge.

Level. This is a distinct stage, degree, or rank within a hierarchical structure or continuum. Operationally, this refers to specific criteria or measures used to identify and categorize individuals or situations within a framework.

Local. This pertains to specific areas or communities. Operationally, this refers to the specific criteria and parameters used to identify and categorize entities.

Malaria. This is a serious infectious disease caused by parasites from the genus Plasmodium, transmitted to humans through the bites of infected female Anopheles mosquitoes. Operationally, this refers to a disease.

Mode of Transmission. This refers to the specific pathways through which infectious agents are transferred from one host to another. Operationally defined in terms of observable and measurable criteria used in public health and research.

Occupation. This refers to a person's principal activity or profession that involves the performance of specific tasks. This is operationally defined through specific criteria and measurements including job titles.

Perceptions. These are the beliefs, attitudes, and interpretations that residents hold about malaria, which can influence their understanding of the disease and their willingness to engage in preventive behaviors. Operationally, these were evaluated through surveys, where they rated their agreement with statements related to malaria.

Practices. These refer to the habitual actions or behaviors that individuals or groups engage in as part of their daily lives. This is operationally defined as specific behaviors and methods that can be observed, measured, and analyzed.

Prevention. This focuses on the overarching goal of averting negative outcomes. Operationally defined, it categorized prevention methods into specific actions.

Profile. This is the representation or description of an individual or entity that highlights key characteristics. Operationally defined, profile refers to the specific criteria and metric used to assess and categorize an individual.

Program. This is a structured set of instructions or a sequence of operations designed to perform a specific task. Operationally, this refers to the practical implementation and execution of a theoretical program.

Public Health Impact. This refers to the effect that public health interventions, policies, or programs have on the health outcomes of a population. Operationally defined through measurable indicators that reflect the effectiveness of public health efforts.

Residents. These are individuals who live in a particular place for an extended period, typically characterized by their established presence and connection to that location. Operationally, these refer to the specific criteria and characteristics used to identify and define individuals living in a particular area.

Sex. This refers to the biological and physiological characteristics that typically define human as male or female. Operationally defined in terms of measurable attributes used in research and data collection.

Signs and Symptoms. These are terms commonly used in medical and health context to describe manifestations of a disease or condition. Operationally, this is defined through specific assessment and documentation.

Treatment. This refers to the management and care of a patient for the purpose of combating a disease or condition. This is operationally defined by specific protocols, methods, and measurable outcomes.

Chapter II
REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents the review of related literature and studies, synthesis, theoretical framework, and conceptual framework pertinent to the topic of malaria.

Related Literature

According to the study of Siagian, (2020) children under five are most at risk for malaria. Global malaria cases have declined gradually, but not as quickly as expected. Malaria still causes death and illness in endemic nations like Indonesia, where children and pregnant women are especially vulnerable. A large percentage of malarial infections cause anemia, and the severity depends on factors such as the patient's gender, age, innate and acquired resistance in endemic regions, comorbidities, and the parasite's species, adhesiveness to smaller vessels, and drug-resistance phenotype. Malaria-related anemia can cause mild to severe morbidity and death, particularly in children and pregnant women.

In Conteh et.al.,(2021) no substantial decrease in malaria burden has been observed since 2015, and in many countries, the disease load is increasing. In 2018, six countries—Nigeria, the Democratic Republic of the Congo, Uganda, Côte d'Ivoire, Mozambique, and Niger—comprised over fifty percent of all malaria cases, while children under five years of age accounted for two-thirds of the 405,000 malaria-related fatalities worldwide. Global investments in malaria are believed to be insufficient to meet the expected resource requirements for achieving development objectives. Amid stringent financing limitations, data on the unit cost and cost-effectiveness of malaria prevention measures has become more critical, and the allocation of resources faces heightened scrutiny. The authors revised prior evaluations of malaria control unit costs and cost-effectiveness, expanding the evidence base by including new data and interventions to enhance decision-making for national malaria control plans.

Briggs et.al.,(2020) found that males have a higher incidence and/or prevalence of malaria infection than females. The epidemiology of malaria is impacted by sex-based changes in host-parasite interactions. The study used amplicon deep-sequencing to assess the force of infection (FOI) and rate of clearance while closely monitoring Plasmodium falciparum infections in a cohort in an eastern Ugandan malaria-endemic region. There was no indication that the incidence of malaria, behavioral risk factors, or FOI varied by sex. However, multivariate models that controlled for age, time of infection onset, and parasite density showed that females resolved asymptomatic infections more quickly than men.

The study by Gunter et.al.,(2021) had a high participation rate, with the Manggarai, Atoni, and Sumba ethnic groups making up a fairly equal portion of the participants. There were notable differences in the prevalence of malaria awareness across these groups, with the Manggarai ethnic group having the highest prevalence and the Sumba ethnic group the lowest. In both the Sumba and Manggarai ethnic groups, education level was the most important factor impacting malaria knowledge, but in the Atoni ethnic group, socioeconomic status (SES) was the most important factor. Those with a diploma or higher had a much higher chance of being aware of malaria. The Atoni group's high-SES adults also had a much higher awareness of malaria.

Memarsadeghi et.al.,(2023) proposed a model indicating that *P. vivax* malaria is more common in wooded regions, particularly along the border between Thailand and Cambodia. The study's two primary occupational groups, farmers and rubber plantation workers, had statistically different average malaria risk values according to the ecological niche model, as shown by ANOVA results. The study revealed that rubber plantation workers in Thailand's Sisaket and Ubon Ratchathani districts were more likely to contract malaria than farmers.

Siagian, (2020) notes that female Anopheles mosquitoes transmit the parasites responsible for malaria, a severe disease. Five species of malaria affect humans: P. vivax, P. falciparum, P. malariae, P. ovale, and P. knowlesi. The spread of this illness is particularly notable around the equator. Despite its perilous nature, it can be both prevented and cured. In 2018, global malaria cases were predicted to be 228 million, and malaria-related morbidity was estimated at 405,000.

Sey et.al., (2020) indicate that symptoms such as fevers, lethargy, headaches, nausea, and muscular pains can lead to prostration, respiratory distress, encephalopathy, anemia, and mortality in malaria. These manifestations arise from the inflammatory response to Plasmodium spp., the demise of infected red blood cells (iRBC), and the parasite's ability to adhere to the endothelium of small blood vessels. Notably, malaria also serves as a risk factor for invasive bacterial infections, primarily attributed to enteropathogenesis and non-Typhoidal Salmonella. Approximately 6.5% of severe malaria cases exhibit bacteremia, which can be fatal.

According to Dagen, (2020) malaria symptoms such as chills, high fever, heavy perspiration, headache, muscle pains, malaise, diarrhea, and vomiting can overlap with other illnesses. If untreated, malaria leads to splenomegaly and recurrent paroxysmal febrile episodes. Plasmodium falciparum can precipitate lethal complications in cerebral malaria, such as anemia, coma, and damage to the lungs, liver, and kidneys. Chronic P. malariae infection can lead to fatal nephrotic syndrome. Chronic malarial infections are debilitating and make the patient susceptible to additional illnesses. Malaria is listed by the WHO as a cause of diarrhea, and uncomplicated malaria patients have reported nausea, vomiting, and diarrhea. In malaria-endemic regions, gastroenteritis and malaria often occur together.

Dagen, (2020) also notes that malaria is an ancient illness. Historically, it caused widespread morbidity and mortality, and climate change could reintroduce malaria to previously malaria-free areas in the tropics. The term "malaria" comes from medieval Italian for "foul air"—"mal aria." The miasma theory of humoral medicine linked many infectious diseases to unclean air, polluted by decaying materials. Public health measures like disposing of foul-smelling garbage and draining stagnant water were meant to prevent disease spread, as mosquitoes lay eggs in stagnant water. Of the 400 Anopheles mosquito species, about 30 carry malaria.

Cheng et.al., (2021) assert that insecticide-treated bed nets (ITNs) and long-lasting insecticidal nets (LLINs) have been essential for malaria control for decades. However, their impact on malaria transmission in Southeast Asia is reduced compared to sub-Saharan Africa, due to differences in the outdoor biting and resting patterns of mosquito vectors. To accelerate malaria eradication efforts in Southeast Asia, mass drug administration (MDA) has become an increasingly recognized strategy.

MDA, a key malaria control method, has proven effective in eliminating malaria in China, the world's largest and most populous nation. MDA involves administering a full course of antimalarial medicine to a defined population in a specific geographical area, regardless of symptoms or infection status, and often repeated at intervals. Initial research assumed MDA could help eradicate P. falciparum malaria, but only as a supplement to insecticides. WHO recommends MDA for malaria and several neglected tropical diseases, including lymphatic filariasis, onchocerciasis, and schistosomiasis Nadia & Lu, (2021).

The introduction of highly effective artemisinin-based combination therapies (ACTs) as first-line treatments and the expansion of parasitological diagnosis have significantly improved malaria case management in the past 10 to 15 years Goodman et. al.,(2024). The World Health Organization (WHO) has recommended parasitological diagnosis for all suspected malaria cases since 2010, as clinical malaria can resemble the early stages of many other diseases. Relying solely on clinical diagnosis leads to many

patients being treated with antimalarials when the disease is non-malarial. The advent of rapid diagnostic tests (RDTs) has greatly improved the feasibility of parasitological diagnosis. However, despite the widespread adoption of ACTs and RDTs in public healthcare facilities across Africa, coverage remains insufficient in the private sector, explaining a high number of malaria and fever treatments sought at public healthcare facilities.

Research in the Lihir Islands of Papua New Guinea among indigenous Melanesian people revealed poor bed net use despite universal coverage of insecticide-treated nets (ITNs) due to low knowledge, attitudes, and practices (KAP) on malaria control. Similarly, a study in Chhattisgarh, India, among the aboriginal Gond tribe highlighted the need for targeted health education efforts to increase malaria KAP in marginalized populations. These findings emphasize the importance of understanding malaria KAP for effective treatment and achieving malaria control and elimination goals Samsudin et.al., (2024).

Gunter et.al.,(2022) emphasize that the timing of treatment-seeking influences the efficacy of malaria therapy. WHO advises that malaria treatment should begin within 24 hours of symptom onset to prevent disease progression. A systematic review revealed that patients who sought care after 24 hours had a higher risk of severe malaria compared to those who sought care within 24 hours. Research in Asian populations showed that patients often sought treatment an average of two days after symptom onset. This delay is largely due to reliance on traditional medicine, challenges in accessing healthcare services, and self-medication through local vendors.

Recent research has shown significant progress in reducing malaria cases and fatalities from 2000 to 2017. However, it failed to account for malaria infection across various age demographics and did not address the stagnation of global development in the past five years. Thus, more current data is needed to better understand global malaria incidence patterns. Liu et.al.,(2021) examine malaria infection data from 1990 to 2019 at global, regional, and country levels using data from the Global Burden of Disease Study 2019 (GBD 2019), extending prior research to provide a comprehensive understanding of long-term trends and regional variations.

Reyes et.al.,(2020) emphasize the need for enhanced geographical and temporal resolution data as malaria transmission decreases. While population-based community surveys are the gold standard for assessing prevalence and geographic infection patterns, they are resource-intensive and may require large sample sizes in low-transmission areas. Alternative surveys targeting easily accessible populations, such as health facility visitors or schoolchildren, offer a more practical, cost-effective solution. These surveys, though not comprehensive, provide timely estimates of malaria prevalence and can help identify transmission foci, particularly in regions like Palawan.

Related Studies

Kinoshita et.al.,(2024) assert that malaria continues to pose a significant threat to pregnant women, with an estimated 120 million individuals at risk. Affected patients may suffer from maternal anemia, low birth weight, and premature delivery. In response, the Philippines has adopted a sub-national disease eradication strategy, aiming to eliminate malaria by 2030. Despite this, many rural healthcare institutions in the country still rely on handwritten charts and registers, often plagued by insufficient data input. To address these challenges, record-linking methodologies have been proposed to integrate data from various sources, thereby enhancing disease surveillance and enabling a more comprehensive understanding of patient care.

Zehner et.al.,(2021) provide additional insight into the pediatric dimension of malaria, reporting that symptomatic cases rose from 1.2 to 2.6 per person-year between infancy (0 to <6 months) and early

childhood (6 to 12 months), while asymptomatic infections dropped from 32% to 21% per month. Notably, the hemoglobin AS (HbAS) protective effect varied with age, suggesting that the immunity of both HbAS and HbAA infants against malaria evolves over time, offering pathways for further exploration into early-life protective mechanisms.

Complementing these findings, Okiring et.al.,(2022) analyzed data from 12 Ugandan public health institutions over 16 months to investigate gender differences in malaria incidence. Their study revealed that females accounted for nearly twice the number of confirmed malaria cases compared to males. Even after adjusting for gender-stratified population estimates, the incidence remained over 70% higher among females, indicating potential behavioral, biological, or systemic factors contributing to this disparity.

Ethnic and genetic variability in malaria susceptibility has also been explored by Arama et.al.,(2015), who highlighted the Fulani of Sudan and West Africa for their reduced vulnerability to malaria in comparison to other sympatric ethnic groups such as the Dogon, Mossi, and Rimaibé. These differences are thought to arise from enhanced humoral immune responses among the Fulani, reinforcing the role of immunogenetic factors in malaria resistance.

The role of education in combating malaria was emphasized by Dike et.al.,(2006), who argued that effective malaria prevention relies heavily on public knowledge, which is in turn shaped by formal education. Educational attainment not only enhances disease awareness but also improves the ability to seek and apply proper treatment. In Uganda, caregivers with higher levels of education demonstrated better malaria-related knowledge and practices, resulting in more effective disease management within households.

Broader social determinants such as poor housing, economic deprivation, and limited access to education further compound malaria's burden, with climate change emerging as a key aggravating factor. According to Lacey et.al.,(2023), rising temperatures and altered weather patterns have extended mosquito breeding seasons and increased stagnant water bodies, leading to an eightfold increase in malaria cases in western Kenya during the 1970s.

In the Philippines, Iskander, (2021) noted that Plasmodium falciparum and P. vivax remain the predominant malaria species, with persistent transmission in remote areas like Bataraza, particularly affecting the indigenous Pälawan communities. As described in *Malaria Symptoms and Treatment Options* (n.d.), symptoms such as fever, chills, and anemia can rapidly escalate to severe malaria if untreated, emphasizing the need for prompt diagnosis and treatment.

Reyes et.al.,(2021) underscore the importance of enhanced surveillance, noting that as malaria transmission decreases, the need for geographically and temporally precise infection data becomes more critical. Although population-based surveys offer reliable prevalence estimates, they are resource-intensive; alternative approaches, such as school- and clinic-based surveys, offer quicker insights into community transmission patterns.

Azurin and Tandang, (2020) outlined the transmission dynamics of malaria, primarily through bites from infected female Anopheles mosquitoes. Although rare, non-vector transmission through blood transfusion, shared needles, and congenital pathways is possible. Globally, over half the population remains at risk, especially in tropical and subtropical regions characterized by wooded, marshy, and hilly terrains that foster vector proliferation.

In Kenya, where approximately 37.2 million people face elevated malaria risk, the disease's impact is intensified by systemic healthcare disparities. Plasmodium falciparum is the leading cause of infection,

often progressing to severe complications if untreated. Weak health systems, poor investment in health education, and a lack of trained professionals have hindered malaria control efforts.

Cheng et.al.,(2021) described the deployment of ITNs and mass drug administration in Southeast Asia. However, due to the exophagic and exophilic behavior of local mosquito vectors, these interventions have proven less effective than in sub-Saharan Africa. Malaria not only impairs health but also reduces school attendance and household productivity, perpetuating poverty in affected regions.

In Malaysia, despite various awareness campaigns, limited community research has been conducted, particularly in regions like Malaysian Borneo. The Philippines faces similar challenges. As Berte et.al.,(2022) noted, primaquine treatment for *P. vivax* and *P. ovale* is provided without prior G6PD testing, owing to the unavailability of point-of-care kits in rural clinics.

Imported malaria is another concern, as highlighted by Agagliati et.al.,(2022) who reported 600–700 annual cases in Italy, primarily among travelers. This underscores the importance of thorough preventive education and prompt diagnosis for returning travelers.

Current elimination strategies focus on high-risk regions using LLINs, IRS, ACT-based treatments, and active case detection. Abdalal et.al.,(2022) noted that in some areas, no local transmission has been reported for years. Still, as Otambo et.al.,(2022) warned, treatment should only follow confirmed diagnosis via microscopy or RDTs to avoid inappropriate use of antimalarials.

In the Philippines, microscopy remains the diagnostic gold standard since its adoption in 2003 Palmares & Martin, (2023). Despite its effectiveness, healthcare-seeking behavior often bypasses formal services. Philothra et.al.,(2023) found that urban residents frequently opt for pharmacies and drug stalls, while rural populations favor kiosks or traditional medicine, largely due to limited access, cost, and educational gaps. Cultural beliefs also influence treatment choices. In South Manokwari, Aceh, and other parts of Indonesia, traditional healers known as *battra* are trusted due to shared cultural and spiritual beliefs. The persistence of such practices highlights the need to tailor health communication to local contexts.

Jezek and Bamodu, (2021) emphasized that malaria eradication in wealthy nations during the 20th century was largely driven by economic development and improved access to antimalarials. Given the strong correlation between malaria burden and economic growth, malaria prevention should be a key component of national development agendas. Understanding the policy processes and historical legacies influencing malaria strategies is crucial for effective intervention.

Perera et.al.,(2022) stress that infectious diseases, including malaria, easily cross borders. International Health Regulations (IHR) provide a legal framework for countries to collaborate in containing outbreaks before they escalate into global threats.

Finally, Naserrudin et.al.,(2023) advocate for a multisectoral approach to vector-borne disease management. Effective malaria control relies on community engagement, government coordination, and support from non-governmental organizations. In Palawan, where 90% of the Philippines' malaria cases are recorded, targeted interventions are essential Blanco et.al.,(2022). Monitoring regional case trends, as Santos emphasized, can guide resource allocation and bolster eradication efforts in high-transmission areas.

Synthesis

Malaria remains a major global health concern, particularly affecting vulnerable populations. Although global malaria cases have declined over time, progress has slowed in recent years, especially in countries with the highest burden. Limited investment in prevention and control strategies continues to challenge

national programs, making effective resource allocation critical. Gender and ethnic differences also influence malaria outcomes. Males often experience higher infection rates, while females tend to recover from asymptomatic infections more quickly, possibly due to biological differences. Awareness and prevention efforts are also shaped by factors such as education and socioeconomic status, demonstrating the need for targeted and culturally sensitive public health campaigns. Environmental and occupational factors further contribute to malaria risk. Individuals living or working in forested or rural areas, such as farmers and plantation workers, face increased exposure due to local ecological conditions. Climate change may also lead to the return of malaria in areas previously free of the disease, calling for adaptable and resilient control strategies. Key interventions, including insecticide-treated nets (ITNs), mass drug administration (MDA), rapid diagnostic tests (RDTs), and artemisinin-based combination therapies (ACTs), have proven effective in reducing malaria cases and improving treatment outcomes. However, the success of these interventions depends heavily on early diagnosis, consistent use, and access to healthcare. Community involvement plays a vital role in malaria prevention, with culturally relevant education and engagement strategies helping to improve awareness and encourage the adoption of protective behaviors. Geographical disparities within countries further complicate the fight against malaria, requiring localized approaches informed by detailed, high-resolution data. Socioeconomic challenges such as poverty, lack of education, and inadequate living conditions increase susceptibility, reinforcing the importance of integrating health interventions with broader development initiatives. In summary, malaria prevention and control require a comprehensive, multi-level approach that not only advances medical tools and technologies but also addresses the environmental, social, and economic factors that influence the disease's transmission and impact.

Theoretical Framework

Florence Nightingale, a nursing and public health pioneer, promoted an environmental philosophy that emphasizes the environment's huge impact on health. Her view that a clean, well-ventilated, and well-designed environment may help malaria recovery and promote health is important for public health. Southern Palawan's malaria problem may be understood and treated using Nightingale's ideas. Nightingale prioritizes sanitation. Improving sanitation in Southern Palawan minimizes mosquito breeding grounds, the major malaria vector. Stagnant water from poor sanitation breeds mosquitoes. Community sanitation—including waste disposal and drainage—can dramatically reduce malaria transmission. Nightingale also prioritized living environment in health promotion. In malaria-endemic areas, homes must be well-ventilated and mosquito-proof. Install window and door screens and promote insecticide-treated nets. These methods prevent mosquito bites and enhance health, reflecting Nightingale's environmental and humanitarian concerns. Public health programs emulate Nightingale. Vector control for malaria needs indoor residual spraying and community-wide insecticide-treated net distribution. These activities help Nightingale's health initiative. Malaria vector reduction improves safety in southern Palawan settlements. Education is key to Nightingale's environmental policy. Community education about malaria prevention, symptoms, and sanitation equips people to battle the disease. Health education may help Southern Palawan residents fight malaria.

Pender's Health Promotion Model focuses on the factors that influence health-promoting behaviors. Personal factors such as prior knowledge and experience with malaria. The elements that affect health behaviors, encompassing perceived advantages, obstacles, and self-efficacy. The intention to participate in health-enhancing activities. This model will guide the analysis of how the residents' knowledge and

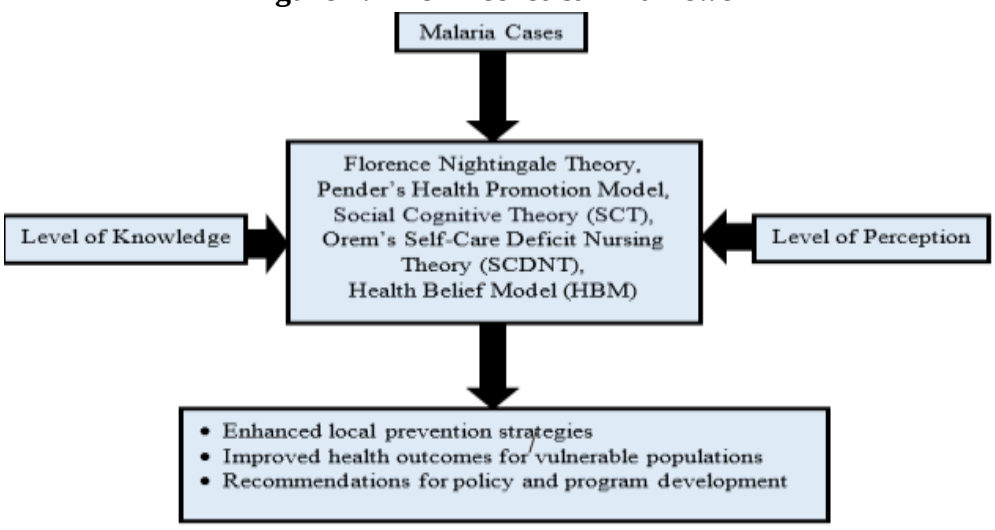
perceptions of malaria affect their commitment to adopting preventive behaviors. This model can be instrumental in assessing the knowledge and perceptions that shape residents' attitudes toward malaria prevention. For instance, understanding beliefs about susceptibility to malaria, the severity of the disease, and the perceived benefits of preventive measures can inform the development of health education initiatives. By addressing specific concerns and barriers identified through this model, health promotion efforts can be tailored to enhance motivation and encourage positive health behaviors within the community.

Another pertinent framework is Social Cognitive Theory (SCT), which emphasizes the dynamic interaction between personal factors, behavior, and environmental influences. Key components of SCT include self-efficacy, or the belief in one's ability to perform a behavior, as well as observational learning and reinforcement. This theory can be instrumental in understanding how social norms and the behaviors of peers influence individual perceptions and actions regarding malaria prevention. For example, if community leaders and peers model effective preventive behaviors, residents may be more likely to adopt similar practices. Understanding these dynamics can help in designing community interventions that leverage social influence to promote malaria prevention.

Orem's Self-Care Deficit Nursing Theory (SCDNT) further supports the framework by identifying situations where nursing care is essential. According to Orem, when individuals lack the knowledge, resources, or ability to care for themselves—such as understanding malaria symptoms or adhering to treatment regimens—a self-care deficit exists. Nurses play a critical role in Southern Palawan by bridging these gaps through education, support, and interventions that build individuals' capacity to manage their own health. By restoring self-care agency, nursing care empowers individuals to take proactive steps in preventing and managing malaria.

Adding a psychological perspective, the Health Belief Model (HBM) provides insight into how personal beliefs influence health behavior. It considers perceived susceptibility to disease, perceived severity, perceived benefits of action, perceived barriers, cues to action, and self-efficacy. In the context of malaria, the HBM is useful for crafting educational messages that resonate with the community's concerns and encourage healthy practices. Addressing misconceptions, emphasizing the dangers of malaria, and reinforcing the effectiveness of ITNs and early treatment can improve community compliance with preventive measures.

Figure 1: The Theoretical Framework



At the core of the conceptual framework is malaria cases, which represent the primary focus of public health efforts. Understanding the factors that contribute to these cases is essential for developing targeted interventions. Two critical components in this framework are the level of knowledge and the level of perception regarding malaria within the community. The level of knowledge pertains to the community's understanding of malaria, including its causes, signs and symptoms, transmission, prevention, and treatment methods. A higher level of knowledge is associated with better health behaviors and outcomes. Florence Nightingale's Theory emphasizes the importance of education and awareness in promoting health. By fostering community education about malaria, individuals can become more informed about the disease, leading to proactive health behaviors such as the use of insecticide-treated nets and timely medical consultations when symptoms arise. In parallel, the level of perception plays a crucial role in shaping individual and community responses to malaria. This component reflects how people view the threat of malaria and the significance they attribute to preventive measures. Pender's Health Promotion Model highlights the influence of personal beliefs and perceptions on health decisions. When community members perceive malaria as a serious health threat, they are more likely to engage in behaviors that reduce their risk, such as using preventive measures and seeking early treatment for symptoms. Moreover, Social Cognitive Theory (SCT) provides additional insights into the dynamics of learning and behavior change within a social context. SCT posits that individuals often learn through observation and imitation. This theory can explain how community members may change their behaviors based on the actions of peers or community leaders who advocate for healthy practices. By creating a supportive environment where healthy behaviors are modeled and reinforced, communities can foster an atmosphere conducive to malaria prevention. The interplay between knowledge, perception, and malaria cases leads to several anticipated outcomes. Firstly, enhancing the level of knowledge and improving perceptions about malaria can result in enhanced local prevention strategies. Health authorities can develop targeted educational campaigns that address specific community needs, thereby increasing awareness of malaria and its prevention. Secondly, improved community understanding and positive perceptions can lead to better health outcomes for vulnerable populations. When individuals are well-informed about the risks and symptoms of malaria, they are more likely to recognize when to seek medical care, ultimately resulting in lower morbidity and mortality rates, particularly among high-risk groups like children and pregnant women. Lastly, the insights gained from examining knowledge and perception levels can contribute to recommendations for policy and program development. By understanding the community's educational needs and perceptions of malaria, local health authorities can design culturally relevant and effective health programs. These programs can align with the beliefs and practices of the community, ensuring greater engagement and sustainability.

Conceptual Framework

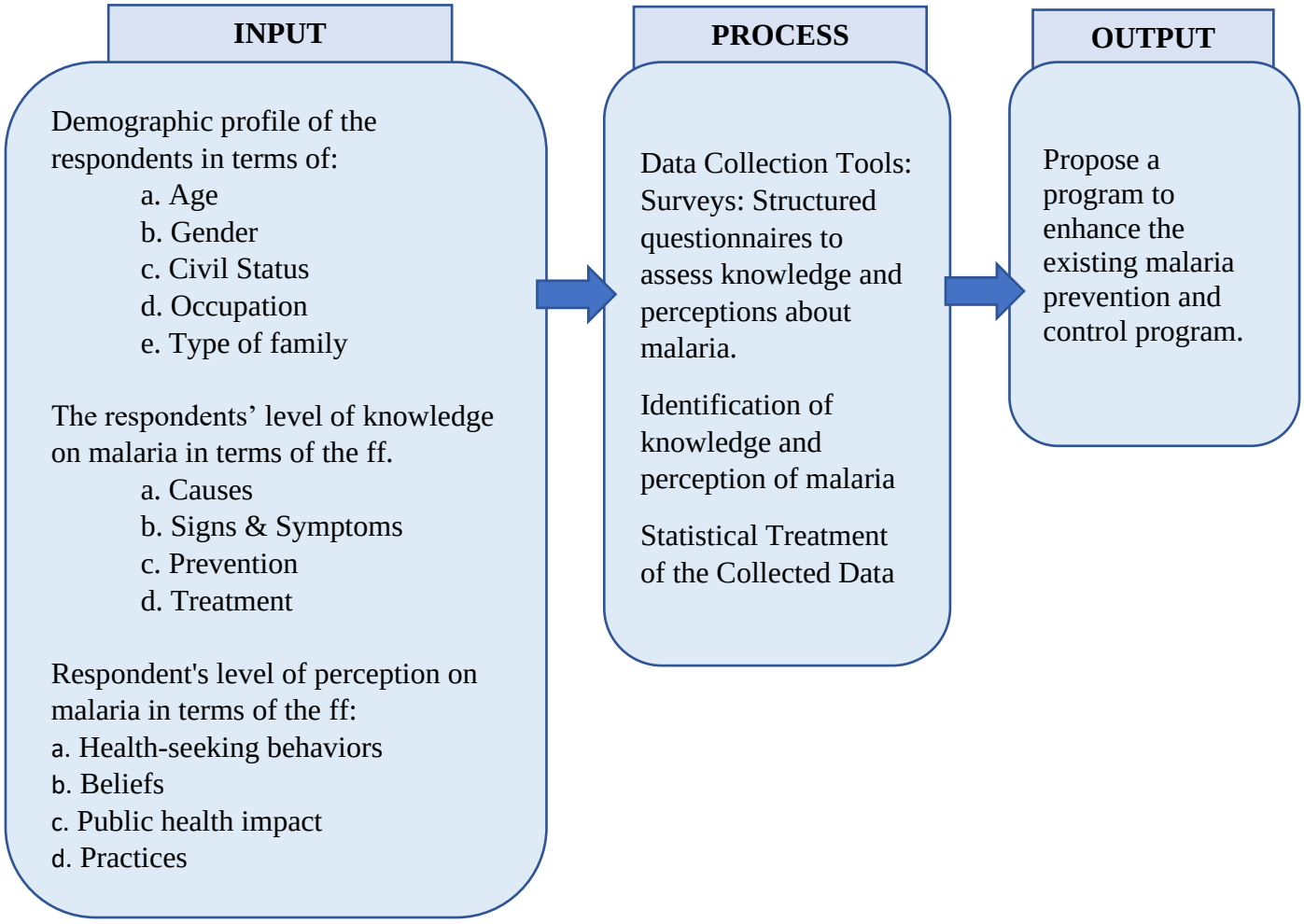
The ongoing challenge of malaria in Southern Palawan demands the exploration of novel strategies to effectively decrease its incidence. A conceptual framework that combines knowledge levels and perception levels related to malaria can offer important insights into tackling the challenges presented by this disease. This framework utilizes essential theoretical models, such as Florence Nightingale's Theory, Pender's Health Promotion Model, and Social Cognitive Theory (SCT). Through the examination of these dimensions, the framework can inform effective strategies aimed at strengthening local prevention initiatives and advancing health outcomes.

This framework centers on malaria cases, serving as the main emphasis of public health initiatives. Grasping the elements that affect these cases is crucial for formulating focused strategies. The framework suggests that the extent of knowledge and the degree of perception regarding malaria play a crucial role in shaping the community's response to the disease.

Research Paradigm

The input-process-output (IPO) model is a conceptual framework for understanding and analyzing the relationships between different variables and factors inside a system or problem. It is used in study design and visually depicts how data, actions, and outcomes move through a workflow or process.

Figure 2. The Research Paradigm



The relationships between the variables examined using the Input-Process-Output (IPO) model are depicted in the above diagram. The input variables are the socio demographic profile of the residents of Bataraza, Palawan. The data collection tools like survey form and interviews and the community context which include the local health data and existing control measures in Bataraza. The process will comprise the research instrument for validity and reliability, administration of the questionnaire, and the statistical treatment of the gathered data. The study's output is the basis for the improved understanding of community knowledge and perceptions will lead to more effective and culturally appropriate malaria prevention strategies. Enhanced collaboration between local health programs and the community can increase the success of malaria control initiatives.

Better understanding of what people in the community know and think will help make malaria control methods that work better and fit with their culture. Malaria control efforts can be more successful if neighborhood health services and the community work together better.
This IPO model helps to organize the study parts in a way that makes sense, so there is a clear path from inputs to outputs that can be used to improve local programs that avoid and control malaria.

CHAPTER III
RESEARCH METHODOLOGY

This chapter provides details and information about the research methods used in this thesis. It also includes the process the researcher used to collect information and the data for this study used by the researcher to initialize more information about the problem. The data collection research method has been chosen to determine and compare the Malaria Cases in Southern Palawan: Implications for Enhancing Local Prevention and Programs. The statistical treatment of data and data gathering procedure are also included in this chapter.

Research Design

The study used a descriptive correlational research design that examines the connections between two or more variables and chi-square test and examined the determinants of malaria cases in Southern Palawan among people in Barangay Rio Tuba, Barangay Taratak, and Barangay Sumbiling in the Municipality of Bataraza. It provided a detailed profile of the respondents' socio demographic profile characteristics and identified key factors influencing their knowledge and perceptions on malaria.

Research Setting

The setting of this study was at the municipality of Bataraza, which included three (3) selected barangays namely Rio Tuba, Taratak, and Sumbiling. The setting was convenient to the researcher due to respondents being easily accessible and expenses were limited to transportation and data provision.

Research Participants/Informants

This study's respondents were the random residents of the municipality of Bataraza. The researcher collected a questionnaire, which in turn supplied the necessary information that the researcher needed. The study population was made up of residents above the age of 18. A stratified random sample method was utilized to assure representation of each barangay.
Sample Size: The sample size was determined using a standard formula for descriptive studies, ensuring sufficient power to detect significant differences in knowledge and perceptions. A minimum of 300 respondents was targeted to ensure the reliability of the findings.

Research Instruments

The researcher adopted a questionnaire developed by Raina, S et al (2016) consisted dynamics of knowledge and perception on malaria. The questionnaire had parts addressing demographics, general knowledge, and perception pertaining to malaria, transmission, prevention, symptoms, and treatment. It also explored participants' opinion of malaria, including their beliefs, impact, attitude, and sources of information. The questions are clear, concise, and appropriate for the target population.

Data Gathering Procedure

The initial phase of the study was to determine respondents. A letter of request for approval was sent to the Barangay Rio Tuba, Taratak, and Sumbiling of Bataraza and the researcher gained permission on collecting data from the community. Afterwards, face-to-face interviews were conducted to gather data. The interviews were carried out in the local vernacular or Filipino language to make sure that respondents could get in touch with interviewees. Before the interviews, each subject was informed of permission, which means they understood the risks and agreed to take part voluntarily. Before the actual data collection started, changes and revisions of questionnaire were made to enhance the quality and relevance of the questions.

Statistical Treatment

The data analysis that was obtained from the respondents was presented systematically in order to attain accurate information based on the data provided by the respondents. The researcher conducted a thorough analysis of the data and examined the participants' degree of knowledge and perspective on malaria. Results were utilized suitable statistical tests or qualitative analysis approached and investigated correlations and themes within the data.

Ethical Considerations

Ethical clearance and letters were obtained from the Palawan State University Ethical Review Board and the selected barangays. Permission was needed from the selected barangay. Information consent was sought from the study participant before data collection. The researcher ensured that all the necessary measures were taken to maintain participant confidentiality. Only a legal order from a legal body can compel the researchers to divulge information as necessary. The involvement was voluntary and they could withdraw any time to participate.

CHAPTER IV
PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter provides a comprehensive analysis of the statistical data gathered to answer the research questions outlined in the study. It encompasses the presentation, analysis, and interpretation of the data, ensuring a clear understanding of the results. Moreover, the results of the statistical tests are examined and discussed.

Respondents' Demographic Profile

The following tables presents the distribution of the demographic profile of the randomly selected residents of Bataraza, Palawan who participated in this study. The demographic variables examined are age, sex, ethnicity, educational attainment, and employment status. Descriptive statistics such as frequency distributions, percentages, and rankings have been employed to effectively convey the collected statistical information.

Table 4.1
Respondents' Demographic Profiles in terms of Age

Respondents' Age	Frequency (f)	Percentage (%)	Rank
20 – 25 years old	70	23.33	1st
26 – 30 years old	53	17.67	2nd
31 – 35 years old	50	16.67	3rd
36 – 40 years old	40	13.33	5th
41 – 45 years old	49	16.33	4th
46 – 50 years old	23	7.67	6th
More than 50 years old	15	5.00	7th
TOTAL	**300**	**100.00**	

The demographic profile of respondents in terms of age reveals significant insights into the level of awareness regarding malaria among the residents of Bataraza, Palawan. As shown in Table 4.1, the largest group of respondents falls within the age range of 20 to 25 years, comprising 23.33% of the total sample. This age group is often characterized by a higher level of engagement with health education initiatives, which may contribute to their awareness of malaria. Younger individuals are typically more receptive to health campaigns and educational programs, as they are often more engaged with social media and community outreach efforts. This supports the study of Kumar, et al. (2020), who noted that younger populations tend to have better access to information and resources, which can enhance their understanding of health issues, including malaria (Kumar et al., 2020).

The data also revealed that the second largest group, aged 26 to 30 years, accounts for 17.67% of the respondents. This demographic is also likely to be influenced by educational programs, but they may have different life experiences and responsibilities that could affect their health awareness. Studies suggest that individuals in this age range often transition into more stable employment and family roles, which can impact their health-seeking behaviors and awareness levels (Smith & Jones, 2019).

Meanwhile, respondents aged 31 to 35 years represent 16.67% of the sample whereas the age group of 36 to 40 years comprise 13.33% of respondents. This trend may suggest that older individuals are less likely to participate in health surveys or may have lower levels of awareness regarding malaria. These age groups may exhibit a decline in awareness compared to younger respondents, potentially due to a combination of factors such as decreased engagement with health education initiatives and increased responsibilities that limit their focus on health issues. This coincides with Miller, at al. (2021), who echoed that older adults often have different health priorities, which can lead to gaps in knowledge about diseases like malaria. The findings also validate the results if Nguyen, et al. (2020), who underscored that older adults often face barriers to accessing health information, including mobility issues and a lack of targeted health education programs.

The young adult is likely to be more engaged with health education including digital platforms and social media, nurses can leverage social media by using platforms to disseminate information about malaria and create interactive health campaigns. Additionally, encourage young people to take on roles as peer educators sharing information to others.

The lower representation of older age groups from 36 years old and above with a steady decline in participation and awareness it signals a need for tailored health promotion strategies that address the unique barriers that older adults face. This includes reduced mobility, lower digital literacy, and competing health priorities Miller et al., (2021). Nurses should execute age specific outreach such as home visits and barangay health seminars. Additionally, efforts must be made to ensure that older adults are included in malaria awareness initiatives by delivering information in accessible formats and in local dialects.

Table 4.2
Respondents' Demographic Profiles in terms of Sex

Respondents' Sex	Frequency (f)	Percentage (%)	Rank
Male	149	49.33	2nd
Female	151	50.67	1st
TOTAL	**300**	**100.00**	

The demographic profile of respondents in terms of sex, as illustrated in Table 4.2, reveals a nearly balanced distribution between male and female participants, with females constituting 50.67% and males 49.33% of the total sample. This slight predominance of female respondents may have implications for the level of awareness regarding malaria, as gender can influence health knowledge and behaviors. Research indicates that women often play a crucial role in health education and family health management, which may enhance their awareness of diseases such as malaria (Morrison et al., 2019).

Moreover, the higher percentage of female respondents suggests that they may be more engaged in health-related discussions and community health initiatives. Studies have shown that women are often more likely to seek health information and participate in health education programs, which can lead to increased awareness and understanding of malaria prevention and treatment (Khan et al., 2020). This engagement is particularly important in malaria-endemic areas, where knowledge about transmission, symptoms, and preventive measures is critical for reducing infection rates.

Conversely, the nearly equal representation of males in the study highlights the need for targeted awareness campaigns that address the specific health-seeking behaviors and knowledge gaps among men. Research has found that men may be less likely to engage in health-seeking behaviors due to cultural norms and perceptions of masculinity, which can hinder their awareness and understanding of health issues, including malaria (Murray et al., 2021). Therefore, it is essential to develop strategies that encourage male participation in health education initiatives, ensuring that both genders are equally informed about malaria prevention and treatment.

Female respondents who tend to be more engaged in health-related discussions and often play a key role in family health management cause empowering women to educate their families and communities by fostering a protective environment against malaria.

Men may face unique barriers to joining health programs, such as cultural norms, busy work schedules, or thinking that seeking help is a sign of weakness Murray et.al., (2021). Nurses should use male focused strategies including workplace health talks, involving male leaders, and using male role models in campaigns. Gender-sensitive approaches like flexible clinic hours, male-friendly messages, and peer groups can help improve men's participation and increase malaria awareness.

Table 4.3
Respondents' Demographic Profiles in terms of Ethnicity

Respondents' Ethnicity	Frequency (f)	Percentage (%)	Rank
Tagalog	95	31.67	2nd
Muslim	60	20.00	3rd
Cuyonon	18	6.00	4th
Tagbanua	12	4.00	6th
Palaw-An	99	33.00	1st
Others	16	5.33	5th
TOTAL	**300**	**100.00**	

Table 4.3 presents the ethnic distribution of respondents in Bataraza, Palawan, revealing a diverse population landscape. The Palaw-An ethnic group constitutes the largest portion of the sample at 33.00%, closely followed by Tagalog respondents at 31.67%. Muslim respondents represent a notable 20.00% of the sample. In contrast, the Cuyonon and Tagbanua groups are represented to a lesser extent, accounting for 6.00% and 4.00% respectively, indicating potential disparities in representation among ethnic groups in the study.

It can be gleaned in the analysis that these variations in ethnic representation suggest significant implications for malaria awareness and health intervention strategies in the region. The prominence of the Palaw-an group highlights the potential effectiveness of culturally tailored health interventions, as research suggests that indigenous populations benefit significantly from approaches that resonate with their specific cultural context (Iskander, 2015). This is particularly important for enhancing their understanding of malaria transmission, prevention, and treatment. This was validated by Khan et al. (2020), who stressed that each ethnic group may face unique challenges in accessing health information due to cultural and religious factors, necessitating targeted health education efforts that respect and incorporate cultural values. Thus, tailoring interventions to respect and incorporate these values can significantly improve malaria awareness and health-seeking behaviors within this community.

With the Palaw-an ethnic group representing a higher group, nursing intervention tailored to resonate with their cultural values and practices that makes health education relevant and effective. This foster equitable accessed to information and improved health outcomes in the community.

Nurses play an important role in helping the Tagbanua people get better access to health education. Since general health programs may not work well for them, nurses should make sure that health messages match their culture and language Khan et.al., (2020). This can include translating materials into local dialects, working with tribal leaders, and visiting remote areas through mobile clinics or barangay health visits. Also, nurses need to build good relationships and show respect for their culture because when indigenous groups feel understood and respected, they are more likely to join health programs. Nurses should also work with community leaders and push for fair health policies so that all ethnic groups, including the Tagbanua, get equal care and education about malaria.

Table 4.4
Respondents' Demographic Profiles in terms of Educational Attainment

Respondents' Education Level	Frequency (f)	Percentage (%)	Rank
Elementary Graduate	79	26.33	2nd
Secondary Graduate	112	37.33	1st
Vocational Course	27	9.00	5th
College Level	51	17.00	3rd
College Graduate	31	10.33	4th
TOTAL	**300**	**100.00**	

Table 4.4 details the educational attainment of the respondents, offering valuable insights into the potential connection between education level and malaria awareness. The data indicates that the largest segment of respondents are secondary school graduates, representing 37.33% of the sample. Elementary graduates constitute the second largest group at 26.33%, followed by those with some college education (17.00%), college graduates (10.33%), and individuals who completed a vocational course (9.00%).

The significant proportion of respondents with only elementary or secondary education suggests a potential area of concern regarding comprehensive health education and its impact on malaria awareness. While these individuals may have some foundational knowledge, their limited exposure to in-depth health education could hinder a complete understanding of malaria transmission, prevention, and treatment. This aligns with research by Sichande et al. (2024), which suggests that individuals with higher levels of education tend to be better informed about health issues, including malaria. This is often because higher education curricula incorporate more detailed health education components, leading to enhanced knowledge of disease dynamics and preventative measures.

The idea that higher education directly correlates with better malaria awareness may not always be accurate. Studies by Jafari et.al.,(2020) and Musa et.al.,(2018) show that cultural beliefs and community based health education programs can had more significant impact on health literacy, even in populations with lower educational levels. Pinto et.al.,(2017) further emphasize the importance of context-specific health communication tailored to local needs. So nurses must focus on culturally sensitive and community-driven health education rather than relying solely on educational attainment. Nurses should use peer education, involve community leaders, and incorporate visual aids or interactive sessions to improve malaria awareness, ensuring that all populations, regardless of education level, understand prevention and treatment strategies.

Table 4.5
Respondents' Demographic Profiles in terms of Employment Status

Respondents' Employment status	Frequency (f)	Percentage (%)	Rank
Employed	149	49.67	1st
Unemployed	110	36.67	2nd
Self-Employed	41	13.67	3rd
TOTAL	**300**	**100.00**	

Table 4.5 presents the employment status of respondents, highlighting important implications for their awareness of malaria. The data reveals that nearly half of the respondents (49.67%) are employed, making this the largest group. This is followed by unemployed individuals, who account for 36.67% of the sample, and self-employed respondents, who represent 13.67%.

The high percentage of employed respondents suggests that this group may have better access to health resources and information, which can enhance their awareness of malaria. This result reflects that employment often correlates with greater exposure to health education initiatives, workplace health programs, and community outreach efforts aimed at disease prevention. This affirms the findings of Nnaji and Ozdal (2023), who denoted that individuals who are employed are generally more engaged in health-promoting behaviors and have higher levels of health literacy compared to their unemployed counterparts. This suggests that employed individuals may possess a more comprehensive understanding of malaria transmission and prevention strategies.

Conversely, the significant proportion of unemployed respondents raises concerns about their potential lack of access to health information and resources. This emphasizes that unemployment can limit individuals' engagement with health education programs, which may contribute to lower awareness levels regarding malaria. This is parallel with Bashar et al. (2022), who underscored that unemployment is often associated with reduced health literacy and poorer health outcomes, as individuals may not prioritize health education when facing economic challenges. Therefore, targeted interventions aimed at unemployed individuals could be crucial in improving their understanding of malaria and encouraging proactive health-seeking behaviors.

According to Bashar et.al.,(2022), self-employed individuals, particularly in rural or informal sectors often fall through the cracks of formal health systems leading to inadequate health education and lower disease awareness. This raises an important implication for nurses to work on health promotion strategies that must be flexible, mobile, and tailored to reach this group. Nurses also should consider integrating community-based health outreach programs during peak gatherings such as market days or barangay assemblies, and using visual, concise, and culturally sensitive health materials

Respondents' Level of Knowledge on Malaria

The following table presents an analysis of respondents' knowledge about malaria, focusing on key areas: (a) causes, (b) signs and symptoms, (c) mode of transmission, (d) prevention, and (e) treatment. The analysis utilizes descriptive statistics, including frequency counts, percentages, and mean ratings, to offer a comprehensive understanding of respondents' knowledge levels regarding malaria.

Table 4.6
Respondents' Level of Knowledge on Malaria

Parameters	Mean Rating	Descriptor
Causes	3.82	High Knowledge
Signs and Symptoms	3.85	High Knowledge
Mode of Transmission	3.37	Moderate Knowledge
Prevention	3.34	Moderate Knowledge
Treatment	3.18	Moderate Knowledge

Overall	**3.51**	**High Knowledge**

Legend for Mean: *No Knowledge: 1.00 – 1.79; Low Knowledge: 1.80 – 2.59; Moderate Knowledge: 2.60 – 3.39; High Knowledge: 3.40 – 4.19; Very High Knowledge: 4.20 – 5.00*

Table 4.6 analyzes the respondents' knowledge of malaria across several key areas. The analysis revealed that the respondents showed a high level of knowledge regarding the causes of malaria with a mean rating of 3.82. This statistic indicates that the respondents demonstrated high understanding that malaria is a parasitic disease transmitted by mosquito bites. This aligns with Laiton et al. (2024), who demonstrated that residents in rural areas exhibited a good understanding of the causes of malaria. They further noted that when individuals correctly identify mosquito bites as the primary mode of transmission, they are more likely to adopt and consistently use protective measures like insecticide-treated bed nets, mosquito repellents, and protective clothing. Further, this finding is also consistent with the assertions of Kahn et al. (2018), who underscored that awareness of the causes of malaria is crucial for effective prevention and management strategies. They further demonstrated a direct link between understanding the causes of malaria and the proactive engagement in behaviors that reduce the risk of infection.

Similarly, the signs and symptoms parameter scored a mean rating of 3.85, indicating a high level of understanding among respondents regarding this crucial aspect of the disease. This suggests that respondents are well-informed about the common clinical manifestations of malaria, including fever, chills, and fatigue, among other potential symptoms. This underscores that recognizing the symptoms associated with malaria is essential for facilitating early diagnosis and prompt treatment, which can significantly reduce the morbidity and mortality associated with malaria. This supports significantly with the research of Afolabi et al. (2019), who argued that individuals capable of accurately recognizing the symptoms of malaria are more likely to seek timely medical attention. This proactive health-seeking behavior directly translates to improved treatment outcomes, as early diagnosis allows for the administration of appropriate antimalarial drugs before the disease progresses. Furthermore, the result of the analysis also validates the findings of Ngasala et al. (2023), who posited that heightened community awareness of malaria symptoms led to earlier diagnosis and treatment, ultimately contributing to a reduction in the incidence of severe malaria cases.

In contrast, a mean rating of 3.37 indicates a moderate level of knowledge regarding the mode of malaria transmission. While respondents generally understand that malaria is transmitted through mosquito bites, a deeper understanding of specific transmission dynamics appears to be lacking. This includes knowledge of the role of different mosquito species, peak biting times, and environmental factors influencing transmission rates. This aligns with the observations of Killeen et al. (2017), who emphasized that detailed knowledge about the specific mode of transmission is often lacking within communities, hindering the effectiveness of preventive measures. This implies that if individuals are not aware of the peak biting times of mosquitoes, they may not consistently use bed nets during those critical periods. Likewise, the results also indicated that while most respondents recognized that malaria is transmitted through mosquito bites, there were significant misconceptions about other potential causes of the disease. The persistence of these misconceptions is concerning because they can undermine the effectiveness of malaria prevention efforts.

Conversely, the mean rating of 3.34 stresses that the respondents have moderate knowledge with regard to the prevention parameter. This suggests that while respondents are aware of basic preventive measures, such as using insecticide-treated bed nets and mosquito repellents, there may be a lack of comprehensive

understanding regarding broader strategies, such as community-level interventions and environmental management. This emphasizes on the importance of educating individuals not only about personal preventive measures but also about community efforts to reduce mosquito breeding sites. This confirms with Mboera et al. (2018), who highlighted that community engagement in malaria prevention significantly enhances the effectiveness of interventions.

Subsequently, the treatment parameter received the lowest mean rating of 3.18, highlighting that the respondents have moderate level of knowledge. Notably, the analysis illustrated that while respondents may be aware of treatment options for malaria, there may be insufficient knowledge regarding the importance of timely treatment and adherence to prescribed regimens. This was captured in the study of Kachur et al. (2019), who have shown that understanding treatment options and the importance of early intervention can significantly improve patient outcomes.

Furthermore, the overall mean score of 3.51, categorized as "High Knowledge," indicates that the respondents possess a solid understanding of malaria encompassing its causes, symptoms, and modes of transmission. This suggests a generally good foundation of knowledge within the community. However, the results of the analysis imply potential for improvement in specific areas. Intervention strategies should therefore focus more on reinforcing existing knowledge, addressing misconceptions, and promoting the translation of knowledge into effective preventive behaviors.

With high knowledge of causes and symptoms and moderate knowledge on other areas. Nurses can collaborate with local health authorities to develop interactive media, radio, or mobile platforms to distribute key messages about malaria transmission, treatment and prevention. Additionally, by using a real-life scenarios or stories to help individuals relate to the disease and recognizing of taking action.

The **moderate knowledge** levels regarding **mode of transmission** indicate the need for more in-depth education on how malaria spreads. Nurses should go beyond general messages and provide detailed explanations about the life cycle of mosquitoes, peak biting times, and the environmental factors that increase transmission risk. Killeen et.al.,(2017) noted that limited knowledge in these areas can hinder the effectiveness of vector control strategies, such as the consistent use of insecticide-treated bed nets. Similarly, the prevention category also reflected moderate awareness, implying that basic protective measures are known, there is still insufficient understanding of community-wide strategies such as environmental sanitation, source reduction, and proper waste management. Nurses must emphasize not only personal protection but also collective actions that reduce mosquito breeding grounds, as supported by Mboera et.al.,(2018), who highlighted the importance of community engagement in effective malaria prevention.

The lowest result is knowledge in the area of treatment that underscores a critical gap in understanding. Respondents may lack sufficient knowledge about the importance of early treatment initiation and strict adherence to prescribed antimalarial medications. Nurses must address this by educating individuals and families on when to seek treatment, the dangers of self-medication, and the necessity of completing the full course of prescribed drugs. This is consistent with the recommendations of Kachur et.al.,(2019), who emphasized that improving knowledge about treatment adherence significantly enhances patient outcomes. Moreover, nurses should actively work to correct misconceptions surrounding malaria causes and treatments, as persistent myths can undermine public health efforts.

Respondents' Level of Perception Toward Malaria

The following table presents an analysis of respondents' perception towards malaria, focusing on key ar

eas: (a) health-seeking behavior, (b) beliefs, (c) public health impact, and (d) practices. The analysis utilizes descriptive statistics, including frequency counts, percentages, and mean ratings, to offer a comprehensive understanding of respondents' perceptions regarding malaria.

Table 4.7
Respondents' Level of Perception on Malaria

Parameters	Mean Rating	Descriptor
Health-Seeking Behavior	3.71	High
Beliefs	2.75	Moderate
Public Health Impact	4.06	High
Practices	4.34	Very High

Legend for Mean: *Very Low: 1.00 – 1.79; Low: 1.80 – 2.59; Moderate: 2.60 – 3.39; High: 3.40 – 4.19; Very High: 4.20 – 5.00*

Table 4.7 reveals the respondents' level of perceptions towards malaria along with the four parameters. The analysis highlighted that the highest mean rating of 4.34 indicates that respondents have a very high perception of malaria prevention practices. This suggests that the respondents are actively engaging in behaviors that are crucial for malaria prevention, such as using insecticide-treated nets (ITNs) and seeking timely treatment. The strong emphasis on practices aligns with findings of Onyinyechi et al. (2023), who argued that effective malaria control is significantly associated with community engagement in preventive measures.

Additionally, the mean rating of 4.06 indicates that the respondents have also a high level of perception of the public health impact of malaria. This illustrates that the respondents recognize the significant burden malaria places on public health systems, particularly in areas where it contributes to morbidity and mortality. This awareness is crucial, as it can drive community support for malaria control initiatives and policies. This validated the study of Deressa et al. (2023), who posited that public health campaigns that effectively communicate the risks associated with malaria can lead to increased community participation in prevention efforts.

Similarly, the mean rating of 3.71 for health-seeking behavior reflects a high level of awareness among respondents regarding the importance of seeking medical care for malaria symptoms. This indicates that individuals are likely to recognize the need for prompt treatment, which is vital for reducing malaria-related morbidity. This corroborates with Bashar et al. (2012), whose study have shown that timely health-seeking behavior is associated with better health outcomes and lower mortality rates in malaria-endemic regions.

Interestingly, the parameter with the lowest mean rating of 2.75 indicates a moderate perception of beliefs related to malaria. This suggests that while some respondents may hold misconceptions or lack confidence in their understanding of malaria transmission and prevention, there is still a foundation upon which to build. This coincides with Nnaji and Ozdal (2023), who argued that beliefs about malaria can significantly influence health behaviors, and addressing misconceptions is essential for effective malaria control.

Beliefs represents the lowest among the respondents' perceptions of malaria, suggesting only a moderate level of understanding and confidence in malaria-related beliefs. This finding implies that while many

respondents may correctly engage in preventive practices, lingering misconceptions such as beliefs that malaria can be caused by dirty food, cold weather, or supernatural forces still persist. These false beliefs can significantly hinder effective malaria control, as individuals influenced by inaccurate perceptions may delay seeking medical care and neglect proven prevention strategies such as insecticide-treated nets (ITNs) and antimalarial medications. Nurses, as educators and advocates in the community, must therefore prioritize correcting these misconceptions through culturally appropriate health education. Interventions should involve open dialogue that respects local traditions while presenting scientific facts clearly and accessibly. According to Nnaji and Ozdal, (2023) addressing belief-based barriers is critical for changing health behaviors and increasing community participation in malaria prevention. Moreover, Deressa et.al.,(2023) emphasize that community beliefs influence the acceptance of health interventions, highlighting the need for trust-building between health workers and local populations. As such, nursing efforts must not only educate but also empower communities to adopt evidence-based practices through storytelling, community discussions, and testimonial sharing, thereby transforming harmful beliefs into informed action.

Relationship between the Respondents' Profiles and Knowledge on Malaria

The following table examines the association between the identified demographic profiles of the respondents and the level of their knowledge on malaria. Furthermore, to test whether the demographics significantly affect the respondents' level of knowledge, inferential measure such as Chi-square Test of Independence was employed, tested at 0.05 level of significance.

Table 4.8
Relationship between Profiles and Level of Knowledge on Malaria

Profiles	p-value				
	Causes	Signs and Symptoms	Mode of Transmission	Prevention	Treatment
Age	0.0004**	0.0021**	0.0034**	0.0209**	0.0328**
Sex	0.1083	0.2107	0.0642	0.3094	0.0832
Ethnicity	0.0931	0.1203	0.4284	0.2063	0.0842
Educational Attainment	0.0052**	0.0045**	0.0025**	0.0039**	0.0043**
Employment Status	0.0041**	0.0325**	0.0032**	0.0374**	0.0052**

Legend: ***Significant at 0.05 level of significance*

Table 4.8 presents a detailed analysis of the relationship between demographic profiles and the level of knowledge on malaria across five key parameters: causes, signs and symptoms, mode of transmission, prevention, and treatment. The analysis depicted by the table reveals a significant relationship between age and knowledge across all five malaria parameters. This suggests that older or younger age groups may have different levels of understanding regarding the causes, symptoms, transmission, prevention, and treatment of malaria. This could be attributed to varying levels of exposure to health education campaigns or differences in health-seeking behaviors. This finding recognizes the notion that age is a significant

predictor of health knowledge and behaviors. This corroborates with Smith et al. (2018), who stressed that older adults in malaria-endemic regions often possess a wealth of traditional knowledge about malaria, while younger individuals may be more receptive to new prevention strategies promoted through digital platforms. Nurses should design and deliver age-appropriate educational materials utilizing digital media and interactive tools for younger individuals, while employing community-based outreach and culturally familiar approaches for older adults, who may rely more on traditional knowledge or have limited digital access.

Notably, educational attainment exhibits a highly significant relationship with knowledge across all five malaria parameters. This finding underscores the critical role of education in promoting health literacy and empowering individuals to make informed decisions about their health. This implies that individuals with higher levels of education are likely to have greater access to information, better comprehension of health messages, and a stronger ability to critically evaluate health information. This aligns with numerous studies that have demonstrated a positive correlation between education and health outcomes Cutler & Lleras-Muney, (2020). Nurses should recognize that individuals with lower educational backgrounds may require simplified, visually guided, and repetitive health messages to ensure comprehension. Integrating health education into adult literacy programs or community learning initiatives can be an effective strategy for bridging this gap.

In the same vein, the analysis also indicated that employment status also demonstrates a significant relationship with knowledge across all five malaria parameters. This suggests that employed individuals may have different levels of knowledge about malaria compared to unemployed individuals. This could be due to factors such as increased access to health information through workplace health programs, greater exposure to social networks that promote health knowledge, or a stronger sense of personal responsibility for health. This is in agreement with Himmelstein et al. (2019), who posited that employment status can influence health behaviors and access to healthcare. Nurses can collaborate with employers and organizations to implement workplace-based health education, particularly in high-risk or resource-limited settings. For unemployed populations, community health nurses must prioritize accessible education campaigns in local centers, clinics, and through home visits.

In contrast, the results of the analysis also showed that sex does not demonstrate a statistically significant relationship with knowledge on any of the malaria parameters. This indicates that, there is no significant difference in the level of knowledge between males and females regarding malaria. This finding contrasts with Khan et al. (2020), who have reported gender differences in health knowledge and behaviors, potentially due to cultural or socioeconomic factors. However, the lack of significance in this study suggests that both men and women have relatively equal access to information about malaria.

Moreover, the results also highlighted that ethnicity does not show a significant relationship with knowledge on any of the malaria parameters. This suggests that here are no substantial differences in malaria knowledge across different ethnic groups. This could be due to the widespread dissemination of malaria information through national health campaigns and community-based programs, which may have effectively reached diverse ethnic groups. However, it is crucial to acknowledge that even in the absence of statistically significant differences, there may be subtle variations in cultural beliefs and practices related to malaria that could influence health behaviors.

Although sex and ethnicity were not significantly related to malaria knowledge in this study, nurses should still maintain an inclusive approach, ensuring that educational outreach is equitable and culturally respectful. While statistical differences may not be evident, cultural beliefs and gender roles can subtly

influence how health information is received and acted upon. Overall, these findings reinforce the need for demographically informed nursing strategies that prioritize equity, accessibility, and cultural sensitivity in malaria education and prevention efforts.

Relationship between the Respondents' Profiles and Perception on Malaria

The following table examines the association between the identified demographic profiles of the respondents and the level of their knowledge on malaria. Furthermore, to test whether the demographics significantly affect the respondents' level of knowledge, inferential measure such as Chi-square Test of Independence was employed, tested at 0.05 level of significance.

Table 4.9
Relationship between Profiles and Level of Perceptions on Malaria

Profiles	p-value			
	Health-Seeking Behavior	Beliefs	Public Health Impact	Practices
Age	0.0004**	0.2375	0.3074	0.6424
Sex	0.0359**	0.1094	0.1306	0.0855
Ethnicity	0.5356	0.0046**	0.4305	0.0237**
Educational Attainment	0.0042**	0.0024**	0.0064**	0.0024**
Employment Status	0.0005**	0.3603	0.1945	0.2904

Legend: ***Significant at 0.05 level of significance*

Table 4.9 explores the relationships between demographic profiles and various dimensions of malaria perceptions, specifically health-seeking behavior, beliefs, public health impact, and practices. Based on the results of the analysis, age demonstrates a significant relationship with health-seeking behavior, suggesting that different age groups exhibit varying tendencies to seek medical care for malaria-related issues. This could stem from differences in health literacy, perceived vulnerability, or access to healthcare services across age cohorts. The results of this study conform with Tessema et al. (2022), who posited that older adults might delay seeking care due to mobility issues or a reliance on traditional remedies, while younger individuals might be more proactive due to greater awareness campaigns targeted at them. However, age does not show a significant relationship with beliefs, public health impact, or practices, indicating that these perceptions are relatively consistent across different age groups. Furthermore, sex shows a significant relationship with health-seeking behavior ($p < 0.0359$), suggesting that males and females may differ in their tendency to seek medical care for malaria. This is in agreement with Kamal et al. (2016), who underscored that women were less likely to seek prompt treatment for malaria compared to men due to gender-specific roles, cultural norms, or access to healthcare services. Meanwhile, sex does not show a significant relationship with beliefs, public health impact, or practices, implying that these perceptions are relatively similar between males and females. The implication is that interventions aimed at improving health-seeking behavior should consider gender-specific barriers and tailor messages accordingly.

It is worth noting that ethnicity does not demonstrate a significant relationship with health-seeking behavior or public health impact. However, the analysis shows a significant relationship with beliefs ($p < 0.0046$) and practices ($p < 0.0237$). This suggests that different ethnic groups may hold varying beliefs about malaria and engage in different prevention and treatment practices. These differences could be rooted in cultural traditions, historical experiences, or access to information. This was highlighted in the findings of Uzochukwu et al. (2009), who demonstrated that some ethnic groups may have traditional beliefs about the causes of malaria that influence their health-seeking behavior. They further argued that cultural beliefs significantly influenced malaria treatment-seeking behavior among different ethnic groups.

Moreover, educational attainment exhibits a significant relationship with health-seeking behavior ($p < 0.0042$), beliefs ($p < 0.0024$), public health impact ($p < 0.0064$), and practices ($p < 0.0024$). This underscores the significant influence of education on malaria perceptions and behaviors. This implies that individuals with higher levels of education are likely to have a better understanding of malaria, hold more accurate beliefs, recognize the public health impact, and engage in more effective prevention and treatment practices. This aligns with Strasser et al. (2017, who have demonstrated a positive correlation between education and health outcomes. They further stressed that higher education levels were associated with improved malaria knowledge and prevention practices.

Conversely, the analysis of data also pinpoints that employment status demonstrates a significant relationship with health-seeking behavior ($p < 0.0005$), suggesting that employed and unemployed individuals may differ in their tendency to seek medical care for malaria. This could be due to factors such as access to health insurance, financial resources, or time off from work. This was emphasized by Anyanwu (2021), who found that unemployment was associated with reduced access to healthcare services. However, employment status does not show a significant relationship with beliefs, public health impact, or practices, indicating that these perceptions are relatively consistent between employed and unemployed individuals.

The study reveal critical insights that nurses can leverage to enhance malaria education and intervention strategies. The significant relationship between age and health-seeking behavior implies that age-specific health education is necessary. Nurses should develop age-appropriate health promotion programs, targeting older adults with accessible and culturally sensitive interventions, while continuing to engage younger populations through digital and community-based campaigns. The significant link between sex and health-seeking behavior suggests a need for gender-sensitive approaches; nurses should identify and address gender-related barriers that prevent timely treatment, such as limited healthcare access for women due to social or cultural norms.

Furthermore, the influence of ethnicity on beliefs and practices highlights the importance of culturally competent nursing care. Nurses must be trained to recognize and respect cultural beliefs about malaria while providing clear, evidence-based information tailored to various ethnic groups. This can promote trust and improve adherence to preventive measures and treatment protocols.

The strong association between educational attainment and all dimensions of malaria perception underscores the vital role of health literacy in malaria prevention. Nurses should prioritize education-focused interventions, particularly in communities with lower educational levels, using simple language and visual aids to enhance understanding. Lastly, since employment status significantly affects health-seeking behavior, nurses should advocate for accessible healthcare services for unemployed individuals, possibly through community outreach, mobile clinics, or partnerships with social services to reduce

financial and logistical barriers to care. These targeted, demographic-informed strategies can lead to more effective malaria control and improved patient outcomes.

CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary of findings, conclusions drawn from the study, recommendations for future research and discussion plan for dissemination.

This study was designed to comprehensively assess malaria-related knowledge and perceptions among residents in rural areas of Bataraza, Palawan. The investigation focused on two primary areas: first, to determine the level of knowledge regarding specific aspects of malaria, including its (a) causes, (b) signs and symptoms, (c) mode of transmission, (d) prevention strategies, and (e) available treatments; and second, to ascertain the level of perception concerning key malaria parameters, namely (a) health-seeking behavior, (b) beliefs surrounding the disease, (c) perceived public health impact, and (d) engagement in preventive practices. A crucial component of the research was also to examine the relationship between the respondents' demographic profiles—encompassing age, sex, educational attainment, ethnicity, and employment status—and their levels of knowledge and perception. Understanding these relationships is vital for tailoring effective public health interventions.

The analysis was based on data collected from a sample of 300 residents purposefully selected from three barangays within Bataraza, Palawan. Purposeful sampling allowed for the inclusion of participants with relevant experiences and knowledge related to malaria. Data collection was facilitated through a researcher-designed questionnaire, carefully structured into three distinct sections. The first section captured detailed information on the demographic profiles of the participants, providing a foundation for subsequent analysis. The second section employed a 17-item Likert scale to quantitatively assess the level of knowledge the respondents possessed regarding malaria. The third section was dedicated to analyzing the perceptions of the respondents concerning malaria, utilizing a combination of question types to capture nuanced perspectives.

To address the research questions, a combination of descriptive and inferential statistical techniques was employed. Descriptive statistics, including frequency, percentage, and ranking, were used to provide a clear outline of the socio-demographic characteristics of the respondents, offering context for the subsequent analysis. Means were calculated to evaluate the overall levels of knowledge and perception among the respondents, providing a quantitative measure of their understanding and attitudes. Furthermore, the Chi-square test of independence was employed as an inferential statistical tool to determine whether significant associations existed between the respondents' demographic profiles and their knowledge and perception levels. This test allowed for the identification of demographic factors that significantly influence malaria-related knowledge and perceptions. All inferential analyses were conducted at a 0.05 level of significance.

Summary of Findings.

Respondents' Demographics Profiles

The demographic profile of respondents by age reveals that the largest group (23.33%) falls within the 20–25-year range, suggesting a higher engagement with health education initiatives and potentially better malaria awareness due to their receptiveness to health campaigns and social media outreach. The second largest group (26-30 years, 17.67%) is also likely influenced by education, but their awareness may be

affected by evolving life responsibilities. The declining representation in older age groups (31-35 years at 16.67% and 36-40 years at 13.33%) may indicate decreased participation or lower awareness due to different health priorities and access barriers, highlighting the need for targeted health education programs for older adults.

With regard to sex, the nearly balanced distribution between female (50.67%) and male (49.33%) respondents suggests a relatively equal representation in the study sample. The slight predominance of female respondents may have implications for malaria awareness, as women often play a crucial role in health education and family health management, potentially enhancing their knowledge of malaria. The equal representation of males underscores the need for targeted awareness campaigns that address specific health-seeking behaviors and knowledge gaps among men, who may be less likely to engage in health-seeking behaviors due to cultural norms, necessitating strategies that encourage male participation in health education initiatives.

In addition, the ethnic distribution of respondents reveals a diverse population, with the Palaw-an group constituting the largest portion (33.00%), followed by Tagalog (31.67%) and Muslim respondents (20.00%). The prominence of the Palaw-an group suggests the potential effectiveness of culturally tailored health interventions, as indigenous populations benefit significantly from approaches that resonate with their specific cultural context. Tailoring interventions to respect and incorporate cultural values can significantly improve malaria awareness and health-seeking behaviors within this community, considering that each ethnic group may face unique challenges in accessing health information due to cultural and religious factors.

Likewise, the educational attainment of respondents shows that the largest segment are secondary school graduates (37.33%), followed by elementary graduates (26.33%). The significant proportion of respondents with only elementary or secondary education suggests a potential area of concern regarding comprehensive health education and its impact on malaria awareness, as their limited exposure to in-depth health education could hinder a complete understanding of malaria transmission, prevention, and treatment. Individuals with higher levels of education tend to be better informed about health issues, including malaria.

Similarly, the employment status data reveals that nearly half of the respondents (49.67%) are employed, making this the largest group. This suggests that employed individuals may have better access to health resources and information, enhancing their malaria awareness, as employment often correlates with greater exposure to health education initiatives, workplace health programs, and community outreach efforts. The significant proportion of unemployed respondents (36.67%) raises concerns about their potential lack of access to health information and resources, emphasizing that unemployment can limit engagement with health education programs and contribute to lower awareness levels regarding malaria, necessitating targeted interventions to improve their understanding and encourage proactive health-seeking behaviors.

Level of Knowledge on Malaria of the Respondents

The analysis of respondents' knowledge of malaria across key areas revealed varying levels of understanding. Respondents demonstrated a high level of knowledge regarding the causes of malaria, indicating a strong understanding that malaria is a parasitic disease transmitted by mosquito bites. Similarly, a high level of understanding was observed for the signs and symptoms of malaria, suggesting that respondents are well-informed about common clinical manifestations like fever, chills, and fatigue, which is essential for early diagnosis and treatment. In contrast, a moderate level of knowledge was found

regarding the mode of malaria transmission, indicating that while respondents generally understand that malaria is transmitted through mosquito bites, a deeper understanding of specific transmission dynamics appears to be lacking. Likewise, respondents showed moderate knowledge regarding malaria prevention, suggesting awareness of basic preventive measures but a potential lack of comprehensive understanding regarding broader strategies.

Subsequently, the treatment parameter received the lowest rating, highlighting moderate knowledge among respondents, indicating that while they may be aware of treatment options, there may be insufficient knowledge regarding the importance of timely treatment and adherence to prescribed regimens. Overall, the respondents possess a solid understanding of malaria, encompassing its causes, symptoms, and modes of transmission, suggesting a generally good foundation of knowledge within the community. However, there is potential for improvement in specific areas, and intervention strategies should focus on reinforcing existing knowledge, addressing misconceptions, and promoting the translation of knowledge into effective preventive behaviors.

Level of Perception on Malaria of the Respondents

The analysis of respondents' perceptions towards malaria across four parameters revealed varying levels of awareness and understanding. The highest mean rating of 4.34 indicates that respondents have a very high perception of malaria prevention practices, suggesting active engagement in crucial behaviors such as using insecticide-treated nets and seeking timely treatment. This strong emphasis on preventive practices highlights the community's commitment to malaria control. Additionally, a mean rating of 4.06 reflects a high level of perception regarding the public health impact of malaria, illustrating that respondents recognize the significant burden the disease places on public health systems, particularly in terms of morbidity and mortality. This awareness is essential for fostering community support for malaria control initiatives and policies.

Furthermore, the mean rating of 3.71 for health-seeking behavior indicates a high level of awareness among respondents about the importance of seeking medical care for malaria symptoms, suggesting that individuals are likely to understand the necessity of prompt treatment to reduce malaria-related morbidity. In contrast, the parameter with the lowest mean rating of 2.75 indicates a moderate perception of beliefs related to malaria. This suggests that while some respondents may hold misconceptions or lack confidence in their understanding of malaria transmission and prevention, there remains a foundational knowledge that can be built upon. Addressing these misconceptions is crucial for enhancing effective malaria control efforts within the community.

Conclusion

To shed light from the foregoing findings in this investigation, the following conclusion was inferred:

- Age demonstrates a significant relationship with knowledge across all malaria parameters, suggesting varying levels of understanding among different age groups regarding the causes, symptoms, transmission, prevention, and treatment of malaria. This may be due to differences in exposure to health education or health-seeking behaviors.
- Educational attainment exhibits a highly significant relationship with knowledge across all malaria parameters, underscoring the critical role of education in promoting health literacy and empowering informed decisions. Higher education levels likely correlate with greater access to information and comprehension of health messages

- There is a significant relationship between the employment status and respondent's knowledge across all malaria parameters, suggesting that employed individuals may have different levels of knowledge about malaria compared to unemployed individuals. This could be due to increased access to health information through workplace programs or greater exposure to social networks promoting health knowledge.
- Sex does not demonstrate a statistically significant relationship with knowledge on any of the malaria parameters, indicating no significant difference in the level of knowledge between males and females regarding malaria.
- There is no significant relationship between ethnicity and knowledge on any of the malaria parameters, suggesting no substantial differences in malaria knowledge across different ethnic groups. This may be due to the widespread dissemination of malaria information through national health campaigns and community-based programs.
- Age demonstrates a significant relationship with **health-seeking behavior**, suggesting that different age groups exhibit varying tendencies to seek medical care for malaria-related issues. This could be due to differences in health literacy, perceived vulnerability, or access to healthcare services. However, it does not show a significant relationship with **beliefs, public health impact, or practices**, indicating that these perceptions are relatively consistent across different age groups.
- Sex shows a significant relationship with **health-seeking behavior**, suggesting that males and females may differ in their tendency to seek medical care for malaria. Yet, it does not show a significant relationship with **beliefs, public health impact, or practices**, implying that these perceptions are relatively similar between males and females.
- Ethnicity does not demonstrate a significant relationship with **health-seeking behavior or public health impact**. However, it shows a significant relationship with **beliefs and practices**, suggesting that different ethnic groups may hold varying beliefs about malaria and engage in different prevention and treatment practices.
- Educational attainment exhibits a significant relationship with **health-seeking behavior, beliefs, public health impact, and practices**, underscoring the significant influence of education on malaria perceptions and behaviors.
- Employment status demonstrates a significant relationship with **health-seeking behavior**, suggesting that employed and unemployed individuals may differ in their tendency to seek medical care for malaria. This could be due to factors such as access to health insurance, financial resources, or time off from work. Meanwhile, it does not show a significant relationship with **beliefs, public health impact, or practices**, indicating that these perceptions are relatively consistent between employed and unemployed individuals.

Recommendations

After examination of the findings and conclusion of the study, the following are strongly recommended for the utilization of the results of this study.

- The Department of Health should prioritize the development and implementation of targeted health education campaigns that are age-specific, addressing the varying levels of understanding and health-seeking behaviors across different age groups. Furthermore, interventions should be designed with gender sensitivity in mind, considering and addressing gender-specific barriers to health-seeking behavior to improve healthcare access for both men and women.

- The Department of Health should may also support the development and implementation of culturally tailored malaria prevention and treatment programs that address the specific beliefs and practices of different ethnic groups. Investing in initiatives that promote health literacy, particularly among individuals with lower levels of education, is essential to improve their understanding of malaria, its prevention, and treatment.
- The Department of Health should undertake a comprehensive review and implement of its existing malaria policies and strategies. This review should emphasize inclusivity, accessibility, and targeted education, with the goal of closing knowledge gaps and enhancing the effectiveness of malaria prevention and control programs.
- Local Government Units should focus on strengthening the capacity of community health workers to deliver targeted health education and promote malaria prevention and treatment practices at the grassroots level. Allocating resources to support malaria control programs is vital, ensuring equitable access to healthcare services and preventive measures for all community members. Furthermore, LGUs should foster community engagement in malaria control efforts, involving local leaders and community members in the planning and implementation of interventions to ensure community ownership and sustainability.
- Members of the community should actively participate in community-based health programs and initiatives aimed at promoting malaria prevention and treatment. It is crucial to seek timely medical care for malaria symptoms and adhere to prescribed treatment regimens to prevent complications and reduce transmission. Community members should also take responsibility for sharing accurate information about malaria with family members, friends, and neighbors, addressing any misconceptions or myths that may exist within their social circles.
- Healthcare practitioners should practice cultural sensitivity when providing healthcare services to patients from diverse ethnic backgrounds, respecting their beliefs and practices to build trust and improve adherence to treatment. Providing patients with clear and concise information about malaria, its prevention, and treatment is essential, ensuring they understand the importance of adherence to prescribed regimens.
- Healthcare practitioners should engage in continuous professional development activities to stay updated on the latest evidence-based practices for malaria prevention and treatment.
- Patients must adhere to prescribed treatment regimens for malaria, completing the full course of medication as directed by healthcare practitioners to ensure complete eradication of the parasite and prevent drug resistance. Adopting preventive measures to reduce the risk of malaria infection is crucial, such as using insecticide-treated bed nets, wearing protective clothing, and applying mosquito repellents.
- Patients should also seek information from reliable sources about malaria, its prevention, and treatment, and not hesitate to ask healthcare practitioners any questions they may have to clarify doubts and make informed decisions.
- Future researchers should conduct qualitative studies to explore the underlying reasons for differences in malaria perceptions and behaviors across different demographic groups, providing deeper insights into the social and cultural factors influencing malaria outcomes. Designing and implementing intervention studies to evaluate the effectiveness of targeted interventions aimed at improving malaria knowledge, perceptions, and behaviors is critical for identifying evidence-based strategies for malaria control.

- Future researchers may conduct longitudinal studies to examine the long-term impact of demographic factors on malaria outcomes and identify potential strategies for promoting health equity.

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