

## PRACTICES AND ADHERENCE TO ANTIBIOTIC USE OF BARANGAY SALVACION, BAYOMBONG, NUEVA VIZCAYA

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### ABSTRACT

Antibiotic resistance remains a critical global health threat, as declared by the World Health Organization, due to its implications for public health, food security, and development. The rise in antimicrobial resistance (AMR) is primarily linked to inappropriate antibiotic usage and poor adherence to prescribed treatments. In rural areas such as Barangay Salvacion, these behaviors are influenced by a range of contextual factors. This study examines local antibiotic use and adherence practices to create effective health education interventions. Employing a qualitative-descriptive design guided by Nola Pender's Health Belief Model, data were gathered through interviews with 11 residents and analyzed using Braun and Clarke's Thematic Analysis. Findings revealed that while many residents obtain antibiotics through pharmacies following physician consultations, others rely on unauthorized sources, such as sari-sari stores or leftover medications at home. In particular, public awareness and knowledge gaps regarding antibiotic use influence residents' self-medication, premature discontinuation of treatment regimens, disposal practices, and retention of unused supplies. Additionally, residents often rely on social media and informal networks for health information, thereby perpetuating misinformation. Only a few participants reported full adherence to prescribed regimens or awareness of the risks of resistance due to early discontinuation or dose alterations. These key findings guided the creation of targeted health education materials distributed within the community. Hence, these results suggest stricter enforcement of antibiotic distribution regulations and safe disposal, along with widespread public awareness campaigns in communities to address misinformation by providing clear, accurate information from healthcare providers and trusted sources.

*Keywords:* Antibiotic adherence, antibiotic resistance, antimicrobial resistance (AMR), community-based intervention, public health education, self-medication, unauthorized antibiotic distribution

### INTRODUCTION

The World Health Organization (WHO) has declared antibiotic resistance one of the biggest threats to global health, food security, and development (WHO, 2020). This resistance endangers healthcare systems, especially for vulnerable patients who lack next-line antibiotics. (Dadgostar, 2019). The declining effectiveness of antibiotics highlights the fragility of our health, economic, and security systems worldwide (MacPherson, 2021). Easy access to antibiotics without prescriptions worsens resistance, and unclear treatment guidelines lead to excessive use.

Antibiotics are drugs that treat bacterial illnesses in the form of pills, capsules, or liquids. Topical applications include lotions, sprays, or ointments for the skin. Eye ointments and eardrops are also available, as are IVs (NLM, 2022). With the progressive and modernizing development of antibiotics, infectious and fatal diseases can now be treated (Hutchings et al, 2019). At present, 27 new antibiotics are being developed against priority pathogens to combat the escalating incidence of AMR due to the stagnation of development (WHO, 2022).

Improper antibiotic disposal is a key contributor to environmental antibiotic resistance (Auta et al., 2019). In the Philippines, many families either retain unused antibiotics or dispose of them improperly due to the lack of return programs or disposal guidelines (Salazar et al.).

Proper use and adherence to antibiotics are crucial to prevent resistance (Chapman, 2018), as non-compliance significantly contributes to the growing problem of antimicrobial resistance (Gasson et al., 2018).

Antibiotic resistance is driven by misuse, including self-medication and irregular dosing (Wall, 2019; CDC, 2022). It's worsened by poor antibiotic recognition, misconceptions, and limited healthcare access (Karuniawati, 2020; Gunasekera et al., 2022; Esteves et al., 2023). Non-prescribed antibiotics like amoxicillin are commonly bought, and practices such as sharing or stopping early are widespread (Irawati, 2019). This is a global issue, worsened by poor regulation and knowledge (Wang, 2022; Belachew et al., 2021).

In the Philippines, studies show a 66% prevalence of self-medication (Robredo et al., 2022), premature discontinuation of antibiotics (Barber et al., 2017), and a knowledge gap by income level (Vidad et al., 2022). In rural Mozambique, people identify antibiotics by color and share them (Cambaco et al., 2020). Globally, ABR is rising due to poor-quality antibiotics, lax regulations, and agricultural misuse (Chokshi, 2019). Despite limited local studies, improper practices such as antibiotic sharing, the use of herbal remedies, and buying from sari-sari stores persist. Thus, a community-based approach and education are crucial to addressing informal antibiotic use (Barber et al., 2017; Robredo et al., 2022).

### **Statement of the Problem**

This study explored the practices and adherence of residents of Barangay Salvacion, Bayombong, Nueva Vizcaya, on antibiotic use during the first semester of School Year 2023-2024, and answered the following questions:

1. What are the residents' practices about antibiotics?
2. How do residents adhere to antibiotic use?
3. What health education information can be developed based on the study's findings?

### **METHODOLOGY**

This study used a qualitative-descriptive research design to explore residents' antibiotic practices and adherence in Baranga Salvacion, Bayombong, Nueva Vizcaya. The qualitative approach focused on understanding individual perceptions through semi-structured interviews. At the same time, the descriptive aspect systematically interpreted these perceptions to highlight community behaviors.

This research was conducted in Barangay Salvacion, a central barangay in Bayombong, Nueva Vizcaya. Its proximity to commercial centers and the Rural Health Unit made it a strategic location for investigating health behaviors in a diverse population. A total of 11 participants were selected through criterion sampling, all aged 19-59 years, from low-income households (below ₱ 10, 481/month), who had used antibiotics in the past 6 months, and who had lived in the barangay for at least 6 months. Those who did not meet the criteria, including individuals aged 18 and below or 60 and above, were excluded.

The study used a semi-structured interview guide to collect qualitative data. This format allowed participants to express their experiences freely, while still enabling the researchers to explore specific topics such as access to antibiotics, antibiotic use practices, adherence to prescriptions, and awareness of antibiotic resistance. It begins by investigating how participants obtain antibiotics, including whether they access them through formal channels, such as

consulting physicians and purchasing from pharmacies, or through informal channels, such as buying from local sari-sari stores. The following set of questions examines practices regarding antibiotic consumption, particularly frequency, reasons for antibiotic use, and whether the full course of treatment is completed. It also looks into behaviors like self-medication, prematurely stopping antibiotics when symptoms disappear, and sharing leftover antibiotics—practices that may contribute to misuse. The final section addresses participants' awareness of the consequences of improper antibiotic use. It probes their understanding of antibiotic resistance and whether they believe their personal behaviors may contribute to this global health threat. Overall, the interview guide is designed to gather comprehensive qualitative data on the patterns and perceptions of antibiotic use in the community.

Validation of the guide questions was sought from experts in the field. The experts sought are registered nurses and have been exposed to community nursing practice. The first validator is a graduate of Saint Mary's University (SMU) with a Bachelor of Science in Nursing (BSN) and has been a Philippine-registered nurse since 2011. Additionally, the validator has 6 months of clinical experience and has served as a nursing instructor for Community Health nursing-related courses since 2022. The second validator is also a graduate of SMU with a BSN degree and has been a registered nurse in the Philippines since 2009. Likewise, the second validator has over ten years of clinical experience, including exposure to community nursing practice as a "nurse to the barrio" for 6 months and serving as a nursing instructor for Community Health Nursing for 1 year now.

The researchers coordinated with the Barangay Chairman of Salvacion to conduct house-to-house visits and recruit qualified participants. After explaining the study and obtaining informed consent, interviews were conducted in private and secure settings. A validated semi-structured interview guide was used, and responses were audio-recorded with the participants' permission. Data collection took place over two weeks during the first semester of the School Year 2023-2024, with ethical standards and participant confidentiality strictly observed.

Interviews were transcribed and anonymized using participant codes (e.g., R1, R2, etc.). Data were analyzed using Braun and Clarke's Thematic Analysis method; familiarization with data, coding of key statements, identification of emerging themes, reviewing and refining themes, defining themes, and writing the report. An inductive approach was applied, and researchers used constant comparison across transcripts to ensure consistency and reliability.

The study was approved by the Saint Mary's University Research Ethics Board (SMUREB), ensuring adherence to ethical research standards. Informed consent was obtained from all participants after explaining the purpose of the study, procedures, and their voluntary right to withdraw at any time. To protect participant privacy, all personal data was anonymized and securely stored. Audio recordings from the interviews were saved on a hard drive, accessible only to the researchers and their adviser. These data will be kept for two years and will be permanently deleted after a 2-year archiving period.

Foreseeable risks such as invasion of privacy, time inconvenience, and concerns about data storage were minimized by conducting interviews at a time and place convenient for participants, explaining the security measures for data storage, and ensuring confidentiality throughout the study. No participants experienced harm or discomfort during the process.

The study benefits residents by increasing awareness of proper antibiotic use and the risks of misuse, including antibiotic resistance. Findings were shared with the community through printed educational materials and presentations, aiming to inform their health practices and promote safer antibiotic use in the future. The researchers reported no conflicts of interest.

The Health Education Information (HEI) material was produced as a pamphlet and a poster. These were then distributed among the residents of the community at the Barangay Health Center, Bayombong Municipal Health Office, Solano Rural Health Unit, University Clinic, and SMU-affiliated hospitals, including Region II Trauma and Medical Center, Nueva Vizcaya Provincial Hospital, Medical Mission Group Hospital, and Salubris Medical Center.

## RESULTS AND DISCUSSION

### Section 1. Practices on Antibiotic Use

This section focuses on antibiotic use practice, particularly antibiotic acquisition and use. It explores disparities among 11 respondents in accessing antibiotics across diverse healthcare systems, socioeconomic statuses, and geographical regions. This section also considers the residents' improper antibiotic use and disposal, providing insight into public awareness and knowledge gaps on antibiotic resistance despite existing awareness campaigns. Finally, it investigates the roles of social circles and digital, non-professional sources in shaping individuals' understanding and behavior regarding antibiotic use.

#### 1.1 Access to Antibiotics

Ten residents stated that they obtain antibiotics from pharmacies authorized to dispense such medications. A response from R8 was, "*Depende, pag galing akong doktor [doon ako bumibili]. Pero kapag kailangan ko na [ng antibiotic], diretso akong botika*" ("It depends. If I've been to the doctor, I buy it from there. But if I need antibiotics, I go directly to the pharmacy"). This suggests that pharmacies remain the primary and most accessible source of antibiotics, indicating a positive trend as pharmacies are more likely to provide regulated antibiotics. Community pharmacists are significant in ensuring proper antibiotic dispensing, patient education regarding antibiotic use, and reduction of antibiotic misuse among the community, as community pharmacies are the top dispensers of antibiotics, implementing antimicrobial stewardship measures to optimize antibiotic use, minimize unnecessary prescriptions, and educate the public on responsible medication use (Rusic et al., 2021).

Meanwhile, eight residents reported obtaining antibiotics during a clinical visit. R4 stated that "*Kapag bumibili ako ng antibiotics, usually bibili lang naman ako kapag prinescribe ito ng doktor*" ("Whenever I buy antibiotics, I usually only buy them when a doctor prescribes them"). Moreover, R5 has stated, "*Hindi naman ako basta basta bumibili ng antibiotic ng walang reseta ng doktor*" ("I don't just buy antibiotics without a doctor's prescription"). These responses indicate reliance on professional guidance from doctors and nurses, reflecting a relatively high level of awareness of proper antibiotic use (Said, 2025).

Nevertheless, three residents reported obtaining their antibiotics from small retail shops, such as sari-sari stores. As R1 says, "*Meron po [mga nagtitinda], 6 pesos sa sari-sari store. Ako rin ang titinda noon, like amox (Amoxicillin).*" "*Sa sari-sari store ko nabili yung gamot ko sa pigs ko for 7 days,*" ("There are [vendors], 6 pesos at the sari-sari store... I would also sell it then, like amox (Amoxicillin). I bought medicine for my boil for 7 days at the sari-sari store."). This suggests that antibiotics are informally available outside of pharmacies, raising concerns about proper regulation and prescription requirements, leading to improper self-medication and antibiotic misuse. Correspondingly, there are existing antibiotic regulations that aim to restrict the over-the-counter (OTC) sale of antibiotics. However, due to a lack of enforcement, improper use continues (Rojop et al., 2024).

Additionally, one resident reported being unaware of the availability of antibiotics in small retail shops, suggesting limited knowledge about informal sales avenues. They stated, "*Wala, wala akong nababalitaan na ganun kasi hindi ako pamilyar na nagbebenta sila ng*

*prescribed drugs*" ("Nothing, I haven't heard of that because I'm not familiar with them selling prescribed drugs"). Furthermore, this emphasizes the need to increase public knowledge about both legal and illegal distribution channels. It also underscores the need to implement policies that strengthen regulatory frameworks and improve the effectiveness of awareness campaigns. Educational interventions within communities are crucial for enhancing antibiotic literacy, particularly regarding the risks of improper use and the importance of obtaining medications from authorized outlets. This prevents the widespread practice of antibiotic self-medication stemming from over-the-counter access, weak regulatory enforcement, and limited consumer understanding of the consequences of improper usage (Corpuz et al., 2025).

### 1.2 Public Awareness and Knowledge Gaps on Antibiotic Resistance

This theme assesses the general public's understanding of antibiotic resistance and its consequences, evaluating the effectiveness of existing campaigns and programs in addressing these gaps. Four residents acknowledged that non-completion of the full course of antibiotics can result in increased dosage or stronger antibiotics. One resident narrates, "*Kapag hindi maganda yung paggamit, pwedeng hindi maging mabisa yung gamot, kaya kukuha na naman ng mas malakas na gamot, hanggang sa maubos na, naniniwala na po ako doon*" ("If the medication is not used properly, it might not be effective, so you end up needing stronger medication, and it goes on until it's all used up. I believe in that now"). Another resident adds, "*Yun [Antibiotic resistance] ba yung kapag hindi mo natapos yung nireseta sayo ng doctor e pwedeng hindi mag take effect yung gamot na gagamitin or mas kailangan ng mas mataas na dosage para mapatay yung bacteria*" ("Is antibiotic resistance when you don't finish the prescribed medication, and it might not work, or you might need a higher dosage to kill the bacteria?"). Misuse and incomplete dosages are the primary causes of resistance. Misinformation, such as public misconceptions that stronger antibiotics are required when symptoms persist or that stopping medication early is harmless, is widespread (WHO, 2020).

Meanwhile, six respondents were unaware of antibiotic resistance. Particularly, some shared that, "*Ngayon ko lang nalaman na ganon pala dapat na kailangan pala tapusin yung binigay sayo*" ("I just learned now that you're supposed to finish the medication given to you") and "*Parang wala naman [epekto ng pagtigil ng pag-take ng antibiotic].*" ("It seems like there's no effect [from stopping the antibiotic]). These gaps suggest an urgent need for public health education on antibiotic resistance and proper adherence to treatment regimens. Many do not understand the mechanisms of resistance, leading to self-medication, improper dosage adjustments, and early discontinuation of antibiotics, all of which contribute to resistance (Nasr et al., 2021). Similarly, rural residents often relied on traditional knowledge or community-shared practices, leading to inappropriate antibiotic use (Labi et al., 2019).

Additionally, the widespread prevalence of antibiotic consumption without proper medical consultation and prescription among the residents suggests the emergence of antibiotic resistance. Seven residents admitted that they engage in self-medication. One resident stated, "*Nasubukan ko [ang mag-self medicate] ng 7 days dito sa parang pigsal ko [sa kamay]*" (I tried self-medicating for 7 days here for what seemed like a boil on my hand). This information poses a significant public health concern, as self-medication is an act of improper drug use. For some, self-medication of antibiotics is considered a form of self-care—a good practice as it is convenient and cost-saving (Eltom et al., 2022). Likewise, it is viewed as an act of responsibility for maintaining health. Medications such as antibiotics are also considered household goods (Torres et al., 2020). Moreover, extrinsic factors such as the inability to afford a consultation and insufficient public health awareness were identified. (Esteves et al., 2023).

Six residents reported that they use antibiotics as a secondary regimen or alternative treatment, aside from delaying their regimen based on their symptoms. Some state, "*Mga 2 days after ko magkaubo tsaka ako bumibili [ng antibiotics]*" ("About 2 days after I started coughing,

that's when I buy [the antibiotics]"), and "*Nu aguyek kasjay [mag-te-take ng antibiotic]*" ("When I have a cough like that [take the antibiotic]"). This indicates that some residents take a reactive rather than preventive approach, delaying antibiotic use rather than seeking immediate medical advice. This leads to the development of antibiotic-resistant pathogens, which are associated with further resistance and increased susceptibility to infection (Bonine et al., 2019). Furthermore, this practice reflects a misunderstanding of the role of antibiotics, which are often perceived as a general cure rather than pathogen-specific. Hence, a healthcare provider must identify the specific pathogen causing the illness, as certain antibiotics are effective only against bacterial classifications (Werth, 2025).

In the context of the social factors that affect antibiotic utilization, familial, cultural, and societal norms were considered, along with social beliefs regarding illness and recovery. Primarily, five of eleven residents reported sharing leftover antibiotics with friends or family members who needed them. Particularly, some of the respondents stated that, "*mga kaibigan ko kapag may nasugat ganon [nagbibigay ng natirang antibiotic]*" ("I give my friend the leftover antibiotics when they have a wound"), "*Oo [nagbibigay sa iba ng mga tira-tirang antibiotics] pag kailangan nila.*" (Yes, I give leftover antibiotics to others if they need it). This practice is highly problematic, as it promotes the use of antibiotics without medical supervision and prescription, leading to potentially ineffective treatment. Patients reused previous medical prescriptions to buy antibiotics (Quebral, 2022). Additionally, sharing antibiotics increases the likelihood of antibiotic resistance, either due to incomplete courses or incorrect antibiotic treatment for a specific illness. Hence, there is a cultural/social component in which individuals feel responsible for helping others by sharing medication rather than advising them to seek medical attention.

The same five residents who reported sharing antibiotics also admitted keeping a residual stock intended for future use, but did not specify whether it was for personal use or sharing. "*Oo meron [nai-stock na gamot], yung amoxicillin,*" ("Yes, I have [stocked medicine], the amoxicillin"), "*Adda agas na dyay mother ko, 1 pad nga antibiotic, agalaak ton idyay nu adda sakit ko.*" ("My mother has medicine, one pad of antibiotics. I will take it when I get sick"). This indicates non-compliance with prescribed antibiotic courses, as proper antibiotic use requires completing the full treatment even if symptoms improve. Common excuses for nonadherence to prescribed courses are forgetfulness and feeling better after a few days of use, which encourage patient education to enhance adherence to prescribed antibiotic courses (Almomani et al., 2022). Additionally, some individuals store unused antibiotics and reuse them for future illnesses, such as when they feel new symptoms (Almehmadi, 2024).

In contrast, only one resident stated that they do not share antibiotics with others, saying, "*hindi po ako nag shshare sa ibang tao*" ("I don't share with other people"). This indicates that most people do not recognize the dangers of sharing antibiotics, suggesting a need for targeted public health campaigns that emphasize the dangers of misuse and the development of antibiotic resistance (Almohammed et al., 2022).

Since antibiotics are considered regulated medications, disposal is as crucial as dispensing because it can serve as a means of access for others. Three residents reported, "*Tinatapon na namin [yung mga hindi nauubos]*" ("We just throw away the unused ones"), "*Hindi na [gagamitin yung natirang gamot].*" ("The leftover medicine won't be used anymore"). Despite these responses, this practice may not be environmentally safe, as throwing unused antibiotics into the trash or flushing them could contribute to environmental contamination and antibiotic resistance (Kaur et al., 2020). In the Philippines, while some residents claimed to return unused antibiotics to pharmacies or health facilities, a significant number admitted to discarding them in household trash or flushing them, suggesting that without clear disposal policies and accessible medication take-back programs, improper disposal remains a common practice (Salazar et al., 2021). Although most of them had received instructions from medical personnel

on how to take them, there was a noticeable lack of knowledge about antibiotic disposal (Khabara et al., 2024).

A minority of people adopt safe disposal techniques such as returning unwanted antibiotics to pharmacies or health care facilities. In many underdeveloped nations, including the Philippines, a lack of systematic disposal rules contributes to extensive environmental pollution, as unwanted antibiotics frequently wind up in landfill garbage or sewage systems, creating a reservoir of resistant organisms in the natural environment, and increasing the AMR epidemic on an ecological scale (Auta et al., 2019). Proper medication disposal is influenced by factors such as convenience, access to collection points, education, and gender. Globally, many households store unused or expired medications due to beliefs about future use, limited access, or uncertainty about disposal methods (Rogowska et al., 2022).

### 1.3 Social Circles and Digital Non-professional Data as Sources of Health Information

This investigates the influence of personal networks and online platforms on antibiotic consumption behaviors. One resident stated, "*Kase sabi nila [family and friends], malakas daw, kaya iniwasan namin yung side effect*" ("Because they said, it's strong, that's why we're avoiding the side effects"), pertaining to the potential organ damage due to antibiotic use. The same resident reported that they relied on online platforms as a source of health information, stating that, "*Nanood kase ako kay Dr. Ong, sabi nya, pwede naming gamot ang amox para sa pigs, hindi ko naman iinumun yung kapag hindi ko napanood yun.*" ("I watched Dr. Ong, he stated that amox can be used for carbuncles, I wouldn't take it if I didn't watch it").

The influence of personal networks and online platforms on antibiotic consumption behaviors is well-documented in public health research. People tend to trust the advice of relatives and friends over professional medical guidance. This social reinforcement of misinformation contributes to antibiotic resistance and adverse health outcomes (Lu et al., 2021). In the Philippines, many rely entirely on non-professional advice from social media influencers and unverified health websites, underscoring the need for community-based health education and stronger digital literacy programs to ensure public access to reliable medical information and responsible antibiotic use (Medina & Tingson, 2019).

This aligns with the response of another resident who stated, "*Dati [tinatapos ang prescribed days] pero ngayon kapag okay na tinigtigil na kasi nga inaalala ngayon yung [antibiotic] tatama sa kidney*" ("Before [used to finish the prescribed antibiotic course] but now if it's already okay I stop because I'm worried now that [antibiotics] will harm the kidneys"), referring to the belief that antibiotics can cause organ damage, leading them to avoid use based on non-professional advice. The spread of misinformation, particularly regarding antibiotic effectiveness and safety, was reported to be linked to increased antibiotic misuse (Chou et al., 2020).

## Section 2. Adherence to Antibiotic Medication

This section addresses key concepts related to residents' adherence to antibiotic regimens, including whether they follow the prescribed regimen or deviate from it. This explores the factors that influence their commitment to abide by the advice of a medical professional. On the contrary, it analyzes self-adjustment of antibiotic prescriptions, describing the factors that influence an individual's decision to alter the dosage and pattern of their antibiotic treatment, regardless of the prescribed guidelines.

### 2.1 Knowledge of Antibiotic Use

Primarily, understanding adherence to antibiotic regimens is a key contributor to residents' adherence to their prescriptions. Four residents demonstrated that they completed

the full course as prescribed by their doctors. One stated, "*Hindi ako [tumitigil magtake] as long na hindi pa tapos yung days [ng prescription] na binigay sa akin, nagtetake pa rin ako [ng antibiotics]*" ("I do not [stop taking] as long as the days are not yet finished [of prescription] that were given to me, I continue to take [antibiotics]"). Another confirmed that, "*Oo kasi yun naman yung nakalagay sa nireseta ng doctor. [tinatapos ng seven days].*" ("Yes, because that is what the doctor prescribed. [Completed in 7 days]"). This indicates a good level of awareness of the need to complete the regimen to ensure antibiotic effectiveness and prevent resistance. Understanding the necessity of completing antibiotics leads to consistent adherence, revealing a significant correlation among knowledge, attitude, and practices (Dhivya et al., 2024). "*Ahm, yes, oo kasi sabi po ng doctor tapusin daw po.*" ("Ahm, yes, yes because the doctor said finish it"), one resident stated. However, with only four of the residents following this practice, there remains a gap in adherence among many respondents. Even though individuals know the proper way to use antibiotics, they still fail to adhere to them and believe that antibiotic resistance occurs only in other nations (Muflih et al., 2021).

Likewise, the same respondents reported strictly following their doctor's prescriptions, indicating that a portion of the sample population sought proper medical consultation before obtaining a prescription. Specifically, the residents stated that, "*Wen, ajay one day ket 3 times a day [nu agtake]*" ("Yes, In one day 3x a day [if taken]"), "*Actually lagi kong sinusunod kung ano yung mga nakalagay sa reseta na binibigay sa akin.*" ("Actually I always follow what's in the prescription that was given to me"). However, given that this percentage is below half of the majority, it suggests that many individuals may either misunderstand or disregard medical instructions, leading to inconsistent antibiotic use. Additionally, two residents recognized the potential consequences of antibiotic misuse due to improper adherence to antibiotic courses, consistent with the findings on public awareness of antibiotic resistance in the previous section. This implies that misuse due to fear of its side effects led them to self-adjust their dosages, suggesting a tailored health education program to prevent antibiotic resistance (Gebregziabher et al., 2024).

Only one resident revealed that "*Kapag bumibili ako ng antibiotics, usually bibili lang naman ako kapag prinescribe ito ng doctor.*" ("If I buy antibiotics, usually, I only buy when the doctor prescribes it"). This implies that there are still individuals who take antibiotics without prior professional consultation, which may, in turn, lead to misuse, incorrect dosing, or the development of antibiotic resistance (Tajali et al., 2024).

## 2.2 Self-Adjustment of Antibiotic Prescription

This explores unauthorized changes to prescribed dosage and regimen completion. Only one resident explicitly states, "*Minsan hindi ko na binibigay, lalo kapag dala-dalawa na, [kaya] hindi ko na binibigay lahat*" (Sometimes I do not give anymore, especially if there are two already, [that's why] I do not give everything anymore). The existence of a misunderstanding of antibiotic dosing significantly reduces drug efficacy and contributes to either treatment failure or resistance. In fact, deviations from prescribed regimens, including alterations in dosage and schedule, increase the risk of developing an antibiotic-resistant infection (Reiner-Benaim et al., 2022). This shows how easily treatment effectiveness can be compromised, and that enhanced patient education and strict adherence to dosing are necessary to prevent the development of resistance and maintain therapeutic effectiveness.

Apart from altering the dosage, six respondents reported not completing their prescriptions. Some stopped taking antibiotics once they felt better, while others discontinued due to concerns about side effects. Only one resident claims, "*Hindi ako [tumitigil magtake] as long na hindi pa tapos yung days [ng prescription] na binigay sa akin, nagtetake pa rin ako [ng antibiotics]*" ("I do not [stop taking] as long as the days are not yet finished [of prescription] that was given to me, I continue to take [antibiotics]"). Some factors affecting adherence include

forgetfulness, premature symptom relief, and adverse side effects that reduce treatment efficacy and lead to the emergence of resistant bacterial strains, increasing the risk of recurrent infections (Endashaw et al., 2022).

### **Section 3. Kamalayan tungkol sa Antibiotic Resistance**

The Health Education Information (HEI) material was entitled "Kamalayan tungkol sa Antibiotic Resistance," which directly translates to 'Antibiotic Resistance Awareness.' The contents were based on the study's significant findings.

It delivers a clear message focused on antibiotics and the risks of improper use, particularly the growing threat of antibiotic resistance. It begins by defining antibiotics and antibiotic resistance to establish context, then outlines proper and improper use, the consequences of resistance, and prevention strategies. It also addresses key issues, such as proper disposal of leftover antibiotics and common misconceptions, including the high prevalence of self-medication (Uddin et al., 2021).

## **CONCLUSION AND RECOMMENDATIONS**

### **Conclusion**

Several important factors that contribute to residents' use and adherence to antibiotics are emphasized in this study. Although most people acquire antibiotics from authorized sources, the ongoing circulation of antibiotics among non-accredited informal sellers is believed to contribute to the misuse. Self-treatment, which gives rise to misinformation and recommendations from social and digital networks, amplifies this situation. While some participants adhere to prescriptions properly, non-compliance is widespread, influenced by misconceptions, fear of side effects, and inadequate duration of therapy—all of which play an important role in the expanding problem of antibiotic resistance.

To address these challenges, the study recommends using Health Education Information (HEI) materials, such as pamphlets, to support the safe use of antibiotics. The educational materials should teach about the necessity of adhering to prescriptions, the risks of antibiotic misuse, and the correct methods of disposing of antibiotics. The research underscores the need for specialized educational and community-based treatment programs.

### **Recommendations**

The study offers several practical evidence-based suggestions for better antibiotic use. Reinforcing public awareness of the dangers of self-medication, prescription, and disposal promotes responsible antibiotic use. Tighter prescription-only selling in authorized shops should be implemented, but in a phased manner of increased awareness. Health Education Information (HEI) pamphlets, as one type of educational resource, may help, as clinics, schools, and communities widely distribute them. Local health units should improve their community outreach programs and encourage consultation to decrease antibiotic acquisition from informal sources. The academic community should promote antibiotic education through curriculum inclusion and student participation in public health initiatives. The proposed actions represent useful measures that match study results to support existing antibiotic stewardship initiatives.

## **REFERENCES**

- Al-Mehmadi, B., Alsubaie, S., Al-Morikhi, O., Alqahtani, F., Almutairi, W., Al-Mutairi, M., Alotaibi, M., Alenazi, S., & Alanazi, K. (2024). Knowledge and attitude of self-medication with leftover antibiotics in Saudi Arabia: A cross-sectional study. *F1000Research*, *12*, 304. <https://doi.org/10.12688/f1000research.130364.2>
- Almomani, B. A., Hijazi, B. M., Al-Husein, B. A., Oqal, M., & Al-Natour, L. M. (2023). Adherence and utilization of short-term antibiotics: A randomized controlled study. *PLOS ONE*, *18*(9), e0291050. <https://doi.org/10.1371/journal.pone.0291050>
- World Health Organization. (2023). Antimicrobial resistance. <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>
- Auta, A., Hadi, M. A., Oga, E., Adewuyi, E. O., Abdu-Aguye, S. N., Adeloye, D., Strickland-Hodge, B., & Morgan, D. J. (2019). Global access to antibiotics without prescription in community pharmacies: A systematic review and meta-analysis. *Journal of Infection*, *78*(1), 8–18. <https://doi.org/10.1016/j.jinf.2018.07.001>
- Barber, D. A., Casquejo, E., Ybañez, P. L., Pinote, M. T., Casquejo, L., Pinote, L. S., Estorgio, M., & Young, A. M. (2017). Prevalence and correlates of antibiotic sharing in the Philippines: Antibiotic misconceptions and community-level access to non-medical sources of antibiotics. *Tropical Medicine & International Health*, *22*(5), 567–575. <https://doi.org/10.1111/tmi.12854>
- Bayombong, Nueva Vizcaya profile. (2020). *PhilAtlas*. <https://www.philatlas.com/luzon/r02/nueva-vizcaya/bayombong.html>
- Centers for Disease Control and Prevention. (2022). How do germs become resistant? <https://www.cdc.gov/drugresistance/about/how-resistance-happens.html>
- Chokshi, A., Sifri, Z. C., Cennimo, D., & Horng, H. (2019). Global contributors to antibiotic resistance. *Journal of Global Infectious Diseases*, *11*(1), 36. [https://doi.org/10.4103/jgid.jgid\\_110\\_18](https://doi.org/10.4103/jgid.jgid_110_18)
- Chou, W. Y. S., Gaysynsky, A., Vanderpool, R. C., & Vander Weg, M. W. (2020). The COVID-19 pandemic and health misinformation: The role of social media. *American Journal of Health Promotion*, *34*(3), 226–228. <https://doi.org/10.1177/0890117120983982>
- Corpuz, J. C. G. (2025). Antibiotic resistance in the Philippines: A public health crisis and call for urgent action. *Health Science Reports*, *8*(3), e70548. <https://doi.org/10.1002/hsr2.7054>
- Dadgostar, P. (2019). Antimicrobial resistance: Implications and costs. *Infection and Drug Resistance*, *12*, 3903–3910. <https://doi.org/10.2147/IDR.S234610>
- Eltom, E. H., Alanazi, A. L., Alenezi, J. F., Alruwaili, G. M., Alanazi, A. M., & Hamayun, R. (2022). Self-medication with antibiotics and awareness of antibiotic resistance among the population in Arar city, Saudi Arabia. *Journal of Infection in Developing Countries*, *16*(11), 1762–1767. <https://doi.org/10.3855/jidc.16853>
- Endashaw, H., Sisay, D., Kassaw, C., & Kassa, R. (2022). Antibiotics nonadherence and its associated factors among households in southern Ethiopia. *SAGE Open Medicine*, *10*, 20503121221090472. <https://doi.org/10.1177/20503121221090472>
- Esteves, T. A., Atabay, G. J., & Tan, E. Y. (2023). Determinants of dispensing antibiotics without prescription by community pharmacists in developing countries: A review. *Journal of Applied Pharmaceutical Science*. <https://doi.org/10.7324/JAPS.2023.52735>
- Gebregziabher, N. K., Netsereab, T. B., Franchesko, B. T., et al. (2024). Prevalence of self-medication practices with antibiotics and associated factors among students in five colleges in Eritrea: A cross-sectional study. *Antimicrobial Resistance & Infection Control*, *13*, 106. <https://doi.org/10.1186/s13756-024-01466-6>
- Gunasekera, Y. D., Kinnison, T., Kottawatta, S. A., Silva-Fletcher, A., & Kalupahana, R. S. (2022). Misconceptions of antibiotics as a potential explanation for their misuse: A survey of the general public in a rural and urban community in Sri Lanka. *Antibiotics*, *11*(4), 454. <https://doi.org/10.3390/antibiotics11040454>
- Hutchings, M., Truman, A., & Wilkinson, B. (2019). Antibiotics: Past, present, and future. *Microbial Biotechnology*. <https://doi.org/10.1016/j.mib.2019.10.008>

- Kaur, S., Gupta, S., Thakur, R., & Verma, R. (2020). Public knowledge and disposal practice of unused antibiotics: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 17(23), 8832. <https://doi.org/10.3390/ijerph17238832>
- Labi, A. K., Obeng-Nkrumah, N., Bjerrum, S., Enweronu-Laryea, C., & Newman, M. J. (2019). Awareness and knowledge of antibiotic resistance in rural and urban communities in Ghana. *BMC Public Health*, 19(1), 737. <https://doi.org/10.1186/s12889-019-7039-9>
- Medina, P. R., & Tingson, A. (2019). Digital health misinformation in the Philippines: Social media, self-medication, and antibiotic resistance. *Philippine Journal of Health Research and Development*, 23(4), 155–170.
- Muflih, S. M., Al-Azzam, S., Karasneh, R. A., Conway, B. R., & Aldeyab, M. A. (2021). Public health literacy, knowledge, and awareness regarding antibiotic use and antimicrobial resistance during the COVID-19 pandemic: A cross-sectional study. *Antibiotics*, 10(9), 1107. <https://doi.org/10.3390/antibiotics10091107>
- Nasr, Z., Paravattil, B., & Wilbur, K. (2021). Public knowledge and attitudes regarding antibiotic use in the Middle East: A cross-sectional study. *International Journal of Pharmacy Practice*, 29(1), 43–51. <https://doi.org/10.1093/ijpp/riab002>
- National Library of Medicine. (2022, January 14). Antibiotics. *MedlinePlus*. <https://medlineplus.gov/antibiotics.html>
- Philippine Department of Health. (2020). *Philippine health facility development plan 2020–2040*. [https://bit.ly/PHFDP2020\\_2040](https://bit.ly/PHFDP2020_2040)
- Reiner-Benaim, A., Neuberger, A., Chodick, G., & Henig, O. (2022). Use of antibiotics and factors associated with treatment failure among 152,245 patients with pneumonia treated in the community: A retrospective cohort study. *European Journal of Clinical Microbiology & Infectious Diseases*, 41(1), 99–108.
- Robredo, J. P. G., Eala, M. A. B., Paguio, J. A., Salamat, M. S. S., & Celi, L. A. (2022). The challenges of combating antimicrobial resistance in the Philippines. *The Lancet Microbe*, 3(4), e246. [https://doi.org/10.1016/S2666-5247\(22\)00029-5](https://doi.org/10.1016/S2666-5247(22)00029-5)
- Rojop, N., Moreno, P., Grajeda, L., Romero, J., Reynoso, L., Muñoz, E., ... Ramay, B. M. (2024). Informal sale of antibiotics in Guatemalan convenience stores before and after implementation of federal antibiotic dispensing legislation. *BMC Pharmacology and Toxicology*, 25(1), 11. <https://doi.org/10.1186/s40360-023-00720-8>
- Rusic, D., Bukić, J., Perišin, A. S., Leskur, D., Modun, D., Petrić, A., Vilović, M., & Božić, J. (2021). Are we making the most of community pharmacies? Implementation of antimicrobial stewardship measures in community pharmacies: A narrative review. *Antibiotics*, 10(1), 63. <https://doi.org/10.3390/antibiotics10010063>
- Said, A. I., Mahmoud, S. A., Bakari, A. I., Upinde, R. K., Aboud, H. A., Mbuya, A. H., & Okafor, C. J. (2025). A survey on public knowledge and awareness about antibiotic use and resistance in Mjini Magharibi-Unguja, Zanzibar. *Journal of Pharmaceutical Research International*, 37(2), 94–105. <https://doi.org/10.9734/jpri/2025/v37i27659>
- Salazar, M. C., Reyes, P. T., & Dela Cruz, J. A. (2021). Antibiotic disposal practices in households: Implications for environmental contamination and resistance in the Philippines. *Philippine Journal of Health Research and Development*, 25(2), 102–118.
- Salvacion. (2022). Bayombong, Nueva Vizcaya profile. *PhilAtlas*. <https://www.philatlas.com/luzon/r02/nueva-vizcaya/bayombong/salvacion.html>
- Scribbr. (2022, July 7). What is the difference between stratified and cluster sampling? <https://www.scribbr.com/frequently-asked-questions/stratified-and-cluster-sampling/>
- Tajali, H., Behrad, S., Ghahari, P., Taheri Roudsari, S. S., & Afraz, E. S. (2024). High prevalence and associated factors of self-medication with antibiotics for oral health issues in the Iranian population (2021–2022). *Avicenna*, 2024(2), 7. <https://doi.org/10.5339/avi.2024.7>
- Torres, N. F., Solomon, V. P., & Middleton, L. E. (2020). Identifying the commonly used antibiotics for self-medication in urban Mozambique: A qualitative study. *BMJ Open*, 10(12), e041323. <https://doi.org/10.1136/bmjopen-2020-041323>

- Uddin, T. M., Chakraborty, A. J., Khusro, A., Zidan, B. R. M., Mitra, S., Emran, T. B., Dhama, K., Ripon, M. K. H., Gajdacs, M., Sahibzada, M. U. K., Hossain, M. J., & Koirala, N. (2021). Antibiotic resistance in microbes: History, mechanisms, therapeutic strategies, and future prospects. *Journal of Infection and Public Health*, 14(12), 1750–1766. <https://doi.org/10.1016/j.jiph.2021.10.020>
- Wall, S. (2019). Prevention of antibiotic resistance: An epidemiological scoping review to identify research categories and knowledge gaps. *Global Health Action*, 12(sup1), 1756191. <https://doi.org/10.1080/16549716.2020.1756191>
- Wang, N. C. (2022). Pre-visit use of non-prescribed antibiotics among child patients in China: Prevalence, predictors, and association with physicians' prescribing of antibiotics at medical visits. *Antibiotics*, 11(11), 1553. <https://doi.org/10.3390/antibiotics11111553>
- Werth, B. J. (2025, January 23). Overview of antibiotics. *MSD Manual Consumer Version*. <https://www.msmanuals.com/home/infections/antibiotics/overview-of-antibiotics>
- World Health Organization. (2022). Lack of innovation set to undermine antibiotic performance and health gains. <https://www.who.int/news/item/22-06-2022-22-06-2022>
- World Health Organization. (2020). *Antibiotic resistance: Multi-country public awareness survey*. <https://www.who.int/publications/i/item/antibiotic-resistance-public-awareness>