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Knowledge, Attitudes and Practices on Antibiotic Use

Inputs to the Development of Educational Materials on Antibiotics

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ABSTRACT

This research study was designed to determine the knowledge, attitudes, and practices on antibiotic use among patients of Rural Health Units in the 5th Congressional District of Camarines Sur, Philippines. Specifically, it aimed to determine the relationship between the demographic profile of the patients and the knowledge, attitudes, and practices on antibiotic use. We also analyze the relationship between the factors that influence antibiotic use and the knowledge, attitudes, and practices and develop educational materials for awareness campaign and counseling. This study uses the descriptive-survey method, of which the questionnaire as the primary data gathering tool supplemented by guided interviews. We used the quota sampling method to determine the 350 respondents in the study. We selected 50 patients from each municipality using the convenience method. Most of the patient's antibiotics use were highly influenced by the financial problem or personal factors, environmental factors, lack of knowledge and information on antibiotics, and socio-economic factors. The personal, environmental, and socio-economic factors that influence antibiotic use are significantly related to the patients' knowledge, attitudes, and antibiotic use practices. The educational materials developed in the study may enhance the level of awareness upon its utilization during educational campaign and patients counseling.

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Introduction

The Philippines is one of the leading countries in combating antibiotic resistance. However, the Philippines is one of the countries with the highest rates of antibiotic sharing and misuse globally. The major causes of antibiotic resistance include misuse and overuse of antibiotics, incorrect treatment practices, and infection causing habits [1].

Antibiotics are commonly administered in response to community- acquired infections and, most often, in an outpatient setting, one of the contributing factors for antibiotic non-compliance. The non-compliance with antibiotic treatment is a common phenomenon, which could harm the success rate of treatment. The inappropriate antibiotic misuse/overuse is currently one of the significant public health issues worldwide that affect the community and the individual. It can lead to bacterial resistance, increasing the burden of chronic diseases, rising costs of health services, development of side effects, and ultimately a more economic burden on the national and global health system [2].

The growing reliance on antibiotic medication as the primary treatment for most illnesses observed among patients in the Bicol Region. In the province of Camarines Sur, particularly in rural or far- flung areas where the access to medications, especially antibiotics, is limited, patients tend to self-medicate their conditions due to lack of knowledge, inappropriate attitudes, and incorrect practices that could lead to antibiotic resistance, which causes potential harm that arises from unintended consequences and antibiotic misuse/ overuse, which causes ineffective management of the illness/disease, slowed the disease's progression, and unimproved patient outcomes.

In Geographically Isolated and Disadvantaged Areas (GIDA) in Camarines Sur, primary care is inaccessible. There is a shortage of necessary essential medicines. They are not receiving a regular supply of drugs, especially the Department of Health's free maintenance medications, which tend to create problems for those community clients with generally poor health conditions and are at higher risk of developing complications.

The researcher, who is a nurse- pharmacist, does several interrelated roles. As a pharmacist, a first–line healthcare provider counsels and advises patients on medication information and safety. A nurse with the deepest desire to educate, assist and monitor medication administration believes that the research study will determine the patients' health needs. The research will also enhance awareness, increase knowledge, correct attitudes, and improve practices on antibiotics' rational use. It may also help plan to develop educational materials on the appropriate usage of antibiotics that will contribute vital information to encourage patients, families, and communities and promote patient care and safety to achieve optimal health levels.

The research study aims to determine the knowledge, attitudes, and practices on antibiotic use among patients of Rural Health Units in the 5th Congressional District of Camarines Sur, Philippines.

Method

Camarines Sur is the largest among the six provinces in the Bicol Region both by population and land area. Camarines Sur has a land area of 526, 682 hectares, 29.87% of the total regional area and 1.75% of the Philippines' total area. The province is divided into five districts, with one chartered city, Naga City, with 35 municipalities, one component city, Iriga City, and has 1,063 barangays. The total population of the province as of 2015 is 1,952,544 and 400,615 households.

The study was conducted in Rural Health Units in each municipality of the 5th Congressional District of Camarines Sur, namely the following: Baao comprises of 30 barangays and has one Rural Health Unit; Balatan composed of 17 barangays with one Rural Health Unit; Bato consists of 33 barangays and has one Rural Health Unit; Buhi has 38 barangays with two Rural Health Units; Bula comprises of 33 barangays with two Rural Health Unit; Nabua composed of 42 barangays with two Rural Health Unit; and, Iriga City consists of 36 barangays and has one City Health Infirmary. Only the Rural Health Unit - I are selected in the study.

The researcher used the Descriptive- survey method using a questionnaire checklist, supplemented by guided interviews. The descriptive-survey method is designed to describe the nature of a situation as it exists at the time of study and explore the causes of particular phenomena. The quota sampling method was used to determine the number of respondents in the study. The study's respondents were 350 patients of Rural Health Units in the 5th Congressional District of Camarines Sur. Specifically, the first 50 patients were selected from each municipality, namely: Baao, Balatan, Bato, Buhi, Bula, Nabua, and Iriga City, through the convenience method.

The self-made questionnaire is written in English with Filipino translation to understand the question easily and respondents can give accurate answers. The questionnaire was divided into three parts: The first part of the questionnaire consists of the demographic profile of the patients The second part is the level of awareness of the patients on antibiotic use along with knowledge, attitudes, and practices. The third and last part is the personal, environmental, and socio-economic factors that influence antibiotic use. Most of the items will be answered by encircling the number of choices. Frequency Count, Percentage Technique, Weighted Mean, Chi-square, and Kendall's Coefficient of Concordance were used to present and interpret the data.

Result and Discussion

The data gathered was organized, tabulated, and analyzed in accordance with the purpose of the research study. The gathered data are presented in tabular and textual forms. Inferences and implications are also mentioned to make these findings more related, comprehensive and significant.

The respondents are endowed with personal characteristics that are beneficial to the study. Fig. 1 to Fig. 5 presents the patients' demographic profile in terms of age, occupation, educational background, geographical distance from the home, and socio-economic status.

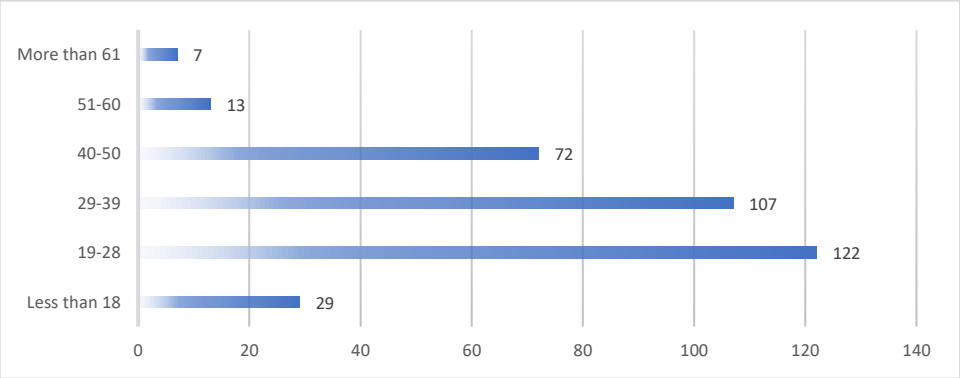


Fig. 1. Age Profile

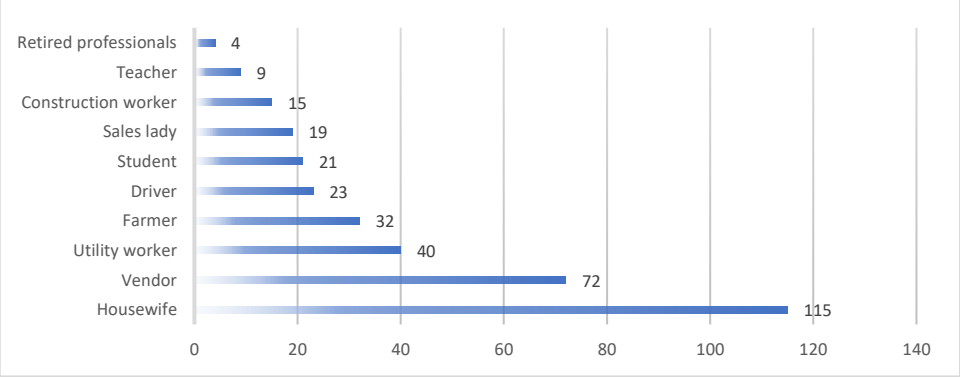


Fig. 2. Occupation Profile

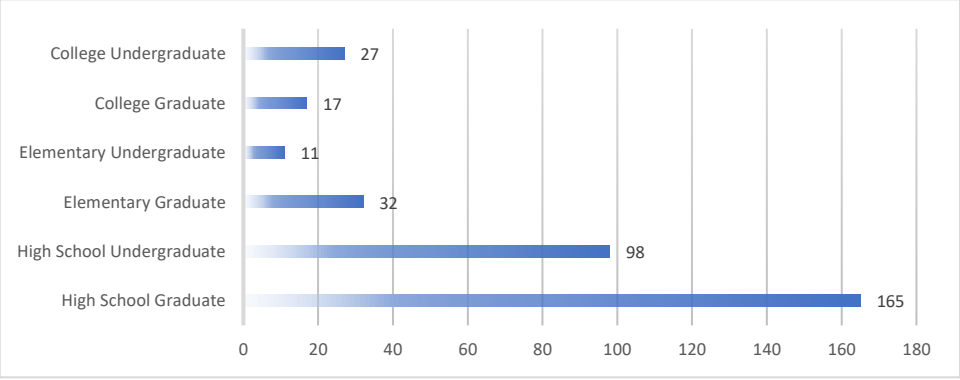


Fig. 3. Educational Background Profile

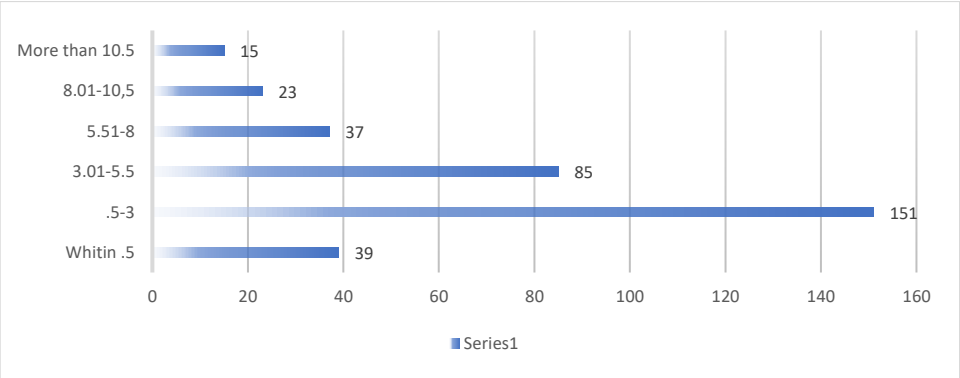


Fig. 4. Geographical Location Profile

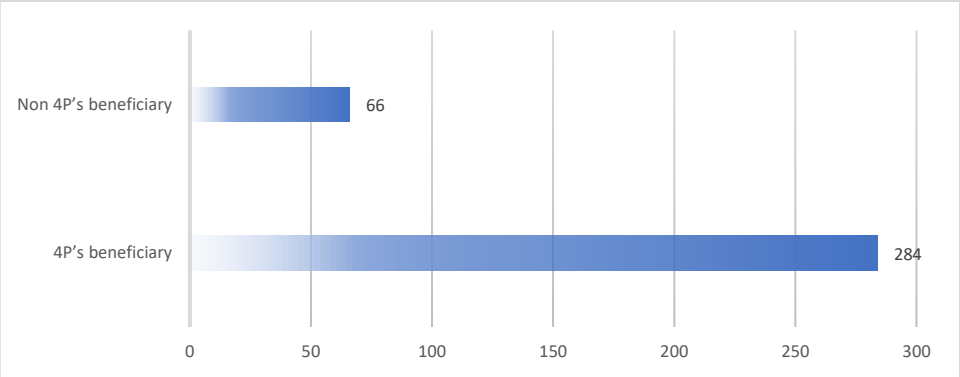


Fig. 5. Socio-economic Status Profile

The findings revealed most of the patients belonged to late adolescence or early adulthood. This stage is characterized by healthy life patterns and attitudes, achieving mature and social responsibility. However, with the challenges being faced by this age group, they are also vulnerable to sickness or illness. The person's age also affects how he or she copes with biological factors that influence beliefs and health practices. It implies that the adolescent period where most individuals first begin to take responsibility for self- medicating minor illnesses.

Ref. [3] indicated that the youngest age groups were higher users of antibiotics inappropriately than the older age groups. This age-related difference in inappropriate use of antibiotics may be due to the extent of experience in the community. Ref. [4] states that as the mother's age increases, the tendency to misuse antibiotic also increases. Most mothers pertained to physicians and health centers' prior consultation to as the most common antibiotic information sources.

A person's occupations do have a bearing on his or her personality. The individual's work also determines the quality of life and the income he derives from it, person's response to a problem is possible, determined by the type of occupation he is engaged in. Out of 350

patients, 115 or 32.86 percent were housewives. It implies that many patients were housewives and shows that there are a high number of unemployed and less educated people in rural areas. It can be deduced that the majority of the patients were female seeking and availing the services of the rural health unit, especially on antibiotics. It can be attributed to the fact that mothers are usually responsible for dealing with children's illness in raising their children, which had a negative attitude as they tend to self-medicate their children's disease, which may also lead to the misuse of antibiotics.

Education is one of the most important characteristics that might affect the person's attitudes and understand particular social phenomena. The data revealed that almost half of the patients were high school graduates with 165 or 47.14 percent. It can be deduced that most of the respondents who engage in inappropriate use of antibiotics were high school graduates and the least who inappropriately use it was the college graduate. It can be attributed to the fact that individuals with lower levels of education were less likely to have poor knowledge and understanding of the appropriate use of antibiotics, than those with higher levels of education which differ from those with lower level of education on their preferences.

According to Ref. [5], respondents with no formal education, primary and secondary education had lower odds of having good knowledge and adequate attitude towards antibiotics use than those with higher education degrees. It was revealed that appropriate knowledge could improve practices and thus influence antibiotic use that would result in proper consumption, reduce antibiotic resistance, and unnecessary expenses in bacterial infection treatment.

The study of Ref. [6], patients with insufficient knowledge of antibiotics, tended to overestimate their understanding of antibiotics. Such overestimation and confidence in self-knowledge were found to negatively affect the prevalence of self-medication behavior to increased non-adherence of medication. The education level among respondents in this study has an important factor that influences the level of knowledge. The respondents with lower educational levels and are those from rural places of residence were less knowledgeable about antibiotics. It was revealed that respondents with higher education were associated with accurate knowledge of antibiotics and understood educational messages. Those living in urban areas were more aware and found to express a more positive attitude towards antibiotics and their rational use.

Based on the findings, most of the patients were 501 meters – 3.0 km, with 151 or 43.14 percent away from the RHU. It implies that respondents with a shorter traveling time between the residence and healthcare facilities could enhance patients' compliance and adapt well to check-up appointment times and treatment. It can be inferred that residents far from Rural Health Units are more likely to store drugs in at homes for the urgency of the condition caused

by infection and when experiencing discomfort in emergency times. This may be related to the distance that the rural villagers have to travel to see a physician or obtain antibiotic drug for infection.

In the study of Ref. [7], which assessed the effect of travel and distance on healthcare facilities, the impact of geographic access is likely to be even more important that health centers should be within 1.5 hours of travel from villages in remote areas. It was also aided by the study of Ref. [8], where patients who often travel long distances and incur large medical care expenses are unlikely to return for follow-up visits.

Of the 350 patients, the majority were 4P's beneficiary with 284 or 84.14 percent. Only 66 or 18.86 percent were non-4P's beneficiaries. It implies that majority of patients go to public health facilities such as rural health units and village health stations to avail the free benefits, access to medical and to support the need for health services. It can be inferred that non-4P's have the financial capacity and social health benefits/ privileges such as Philhealth, Senior Citizen and PWD discounts and can avail the services of private hospitals that they considered providing better health access and quality services. However, everybody has health care benefits that are subsidized by the government.

Ref. [9] study identified persons in demographic groups who had higher levels of misconceptions and lower levels of knowledge about antibiotics' potential adverse impact. These groups included lower socio-economic status, lower educational status, and those in younger age groups. It was revealed that persons of higher socio-economic level have better access to health care and are more likely to use antibiotics and find out that people who use antibiotics were more likely to have medical insurance.

Table 1 shows the level of awareness in terms of knowledge of the patients on antibiotic use. Results reveal that the patients' level of awareness in terms of knowledge varies from high to low degree of awareness. The average weighted mean is 2.80, interpreted as moderate on the knowledge of the use of antibiotics.

Table 1. The level of awareness in terms of knowledge

No	Indicators	WM	Interpretation
1	Antibiotic treats only bacterial infections	2.68	Moderate
2	Antibiotic are not effective against viruses	2.14	Low
3	Different antibiotics are needed to cure different diseases	2.53	Low
4	Antibiotics are not similar to vitamins	3.10	Moderate
5	Use antibiotics onle when are required and prescribed	3.38	Moderate
6	Start antibiotic as soon as you got sick with prescription	2.62	Moderate
7	Frequent use of antibiotics will decrease effectiveness of treatment when using antibiotics again	2.68	Moderate
8	Some people are allergic to antibiotics, thus prescription is needed	3.33	Moderate
9	Antibiotics speed up the recovery from an illness diagnosed bt a physician	3.48	High
10	Antibiotics overuse leads to antibiotic resistance	2.09	Low
	Average Weighted Mean	2.80	Moderate

It implies that the patients' level of awareness was moderate on the knowledge of antibiotic use. Most patients highly believed that antibiotics speed up the recovery from an illness diagnosed by a physician and have insufficient knowledge that antibiotic overuse leads to resistance. They may be less knowledgeable about antibiotics' effectiveness, which is not used in treating viral infections. It was unclear to them whether antibiotics are effective against bacteria and viruses or that antibiotics work against both. Basic knowledge about one's own disease and its treatment is an essential positive factor related to health literacy that will avoid the ill effect of improper or irrational use of antibiotics.

It can be inferred that patients have general misconceptions that infection of any origin needs antibiotic treatment. This could be attributed to the fact that most health care providers explain the nature of disease using the general term microbes rather than clearly stating it as bacteria or virus.

Ref. [10] concluded that a low level of knowledge might put adolescents at risk for health-related problems and low transition from childhood to adulthood. Before adolescents can formally assume such new responsibilities, they must possess three prerequisites: adequate knowledge of common medications, positive attitudes towards medication use, and various experiences with medicines that provide them practical learning. These prerequisites can assist them towards their gradual shift to independence that can guarantee safe and effective outcomes in terms of healthcare behavior.

Ref. [11], which evaluated knowledge, attitudes, and practices regarding antibiotic use among university students. The respondents stated that antibiotics are appropriate for viral infections, think that antibiotics can speed up the recovery of cold and cough, and provided a positive response regarding the better efficacy of newer and costly antibiotics.

Table 2 presents the patients' attitudes on the use of antibiotics, both good and bad. Based on the results, patients' perspectives are affected by their beliefs, knowledge, and preferences with an average weighted mean of 3.39, interpreted antibiotic use.

Table 2. The level of awareness in terms of attitudes

No	Indicators	WM	Interpretation
1	I make sure to complete/ finish the course of treatment when taking antibiotics	3.19	Moderate
2	I only buy antibiotics with doctor’s prescription	3.57	High
3	I take antibiotics with prescription	3.23	Moderate
4	I consult the doctor before using leftover antibiotics	3.12	Moderate
5	I stop taking the antibiotics before completing the course	3.46	High
6	I prefer taking antibiotics for more than a week to stop the cough	3.51	High
7	I read/ follow instructions in taking antibiotics	3.24	Moderate
8	I trust the advice of familiy or friends in taking antibiotics	3.38	Moderate
9	I fear taking antibiotics that is why I stop taking it after I start to feet better	3.62	High
10	I keep antibiotics at home for future use because I want to save money	3.56	High
	Average Weighted Mean	3.39	Moderate

It implies that misconception in the antibiotic use may put the patient at risk of relapse with antibiotic-resistant bacteria with inadequate dosing, incomplete courses, and indiscriminate drug use have contributed to the emergence and spread of antibiotic resistance. It can be inferred that if the health messages on the appropriate use of antibiotics imparted to patients were erroneous, they would possibly develop wrong beliefs and attitudes.

In turn, these attitude are contributory factors in the inappropriate use of antibiotics that lead to antibiotic resistance. Knowledge is not enough to correct attitudes but plays a vital role in shaping particular behavior beliefs. Thus, knowledge was found to be a predictor for a positive attitude and behavior.

In the study of Ref. [12], the four most common irrational behaviors identified among the respondents are forgetting to take antibiotics at the right time, taking antibiotics without prescription, stopping antibiotics immediately if they feel better, not asking the doctor before taking alcohol while taking antibiotics. It was also aided by the study of Ref. [1], who stressed that antibiotic sharing was common and associated with a misconception about proper antibiotic use. The majority of the respondents indicated they had shared antibiotics in their lifetime, and data from the sari-sari stands revealed that antibiotics were readily available without a prescription. The misconception that it is safe to prematurely discontinue an antibiotic course and fear of antibiotic side effects was associated with increased odds of antibiotic sharing.

Table 3 presents the level of awareness in terms of practices of the patients on antibiotic use. The average weighted mean is 3.21, interpreted as moderate on the attitudes on the use of antibiotics.

Table 3. Example table The level of awareness in terms of practices

No	Indicators	WM	Interpretation
1	Saving remaining antibiotics for the next time you get sick	3.73	High
2	Looking at the expiration date of the antibiotics taking it	2.16	Low
3	Discarding remaining or leftover antibiotics	2.21	Low
4	Taking antibiotics every time start feel unwell	3.29	Moderate
5	Buying antibiotics by bringing old antibiotics packaging or the sample of used antibiotics	3/75	High
6	Giving own prescribed antibiotics if the familiy member is sick	3.45	High
7	Taking antibiotics on and off	3.86	High
8	Consulting the doctor regarding antibiotics being prescribed	2.57	Low
9	Consulting a doctor when sick	3.73	High
10	Completing the prescribed duration of treatment of antibiotics even if start feeling better	3.39	Moderate
	Average Weighted Mean	3.21	Moderate

The findings revealed that the patients have an incomplete understanding when taking antibiotics and often use erroneously, without proper guidance, which leads to the improper use of antibiotics and inappropriate dosage, causing more harm than benefits. Medication

administered inappropriately leads to wastage of resources and carries potential severe and life-threatening adverse effects for the patients.

Knowledge and attitudes influence patients' behaviors, and outcomes and knowledge are often correlated with better health practices. Patients' awareness can lead to a more trusting environment concerning medicine such as antibiotics and trust in healthcare professionals. If patients are more aware of the practices in antibiotic use and its resistance, they are more likely to gain trust in the prudent use of antibiotics and improve their practices.

This was supported by the study of Ref. [13], which revealed that respondents usually stop taking the antibiotics before seven days of treatment. Sometimes, they keep the remaining antibiotics for the next time they get sick, save the remaining leftover medication, and give the leftover medication to their family members/ friends/relatives. The respondents were uncertain that they could get trustworthy information on antibiotics from doctors and pharmacists and unsure if expensive antibiotics are more effective than the cheaper ones.

The study made use of Chi – Square Test to determine the significant relationship the demographic profile of the patients and their level of awareness along knowledge, attitudes, and practices on antibiotic use. Demographic Profile and Knowledge on Antibiotic Use. Table 4 displays the relationship between the demographic profile of the patients and their knowledge on antibiotic use.

Table 4. Relationship between the Demographic Profile and the Knowledge on Antibiotic Use

Profile	Computed Value	Tabular Value	Decision on H0	Interpretation
Age	7.98	7.82	Rejected	Significant
Occupation	9.08	7.82	Rejected	Significant
Educational Background	10.11	7.82	Rejected	Significant
Geographical Location	8.64	9.84	Accepted	Not Significant
Socio-economic Status	0.72	.81	Accepted	Not Significant

Further, geographical location/ distance from home with a computed value of 8.64 and tabular value of 9.84 and socio- economic status with a computed value of 2.84 and tabular value of 0.81 were lesser than the tabular values at 0.05 level of significance. Hence, the null hypothesis is accepted. Thus, there is no significant relationship between the geographical location/distance from home and socio- economic status and the knowledge on antibiotic use. It can be inferred that geographical location/distance from home and socio-economic status of the patients does not affect their knowledge on antibiotic use.

The statistical test result showed that age, occupation, and educational background with computed values of 7.98, 9.08, and 10.11, respectively, were higher than the tabular value of 7.82 at 0.05 level of significance. Therefore, the null hypothesis is rejected. This implies that the patients' age, occupation, and educational background significantly influence their knowledge on antibiotic use.

The study of Ref. [2] evaluated the public knowledge and attitudes towards antibiotic utilization and the association of knowledge with demographic variables. They found out that demographic characteristics such as age, gender, educational level, and occupation were significantly associated with knowledge of antibiotic usage. It has been concluded that although knowledge of public is good, the public should stressed out of the importance of correct usage of antibiotics and promote changes in their attitude towards antibiotic use.

Table 5 exhibits the relationship between the demographic profile of the patients and their attitudes on antibiotic use.

Table 5. Relationship between the Demographic Profile and the Attitudes on Antibiotic Use

Profile	Computed Value	Tabular Value	Decision on H0	Interpretation
Age	8.02	7.82	Rejected	Significant
Occupation	6.81	7.82	Accepted	Not Significant
Educational Background	9.05	7.82	Rejected	Significant
Geographical Location	7.32	9.84	Accepted	Not Significant
Socio-economic Status	0,68	0.81	Accepted	Not Significant

Findings revealed that age and educational background obtained computed values of 8.02 and 9.05, respectively. These values exceeded the tabular value of 7.82 at 0.05 level of significance. Therefore, the null hypothesis is rejected. This implies that the patients' age and educational background significantly influence their attitudes on antibiotic use.

Whereas the occupation with a computed value of 6.81 and tabular value of 7.82, geographical location/distance from home with a computed value of 7.23 and tabular value of 9.84, and socio-economic status with a computed value of 0.68 and tabular value of 0.81, were lesser than the tabular values at 0.05 level of significance. Hence, the null hypothesis is accepted. Thus, there is no significant relationship between occupation, geographical location/distance from home and socio-economic status and the attitudes on antibiotic use. This can be deduced that occupation, geographical location/distance from home and socio-economic status of the patients does not affect their attitudes on antibiotic use.

The study performed by Ref. [14] on parental knowledge, attitudes, and practices on antibiotic use, they found out that an increase in age and educational background could lead to better knowledge on the effectiveness of antibiotic use and can be observed in parents who had higher academic level. The parental attitude was found to be associated with age and educational level. Table 6 shows the relationship between the demographic profile of the patients and their practices on antibiotic use.

Table 6. Relationship between the Demographic Profile and the Practices on Antibiotic Use

Profile	Computed Value	Tabular Value	Decision on H0	Interpretation
Age	8.26	7.82	Rejected	Significant
Occupation	7.98	7.82	Rejected	Significant
Educational Background	8.93	7.82	Rejected	Significant
Geographical Location	7.68	9.84	Accepted	Not Significant
Socio-economic Status	0.67	0.81	Accepted	Not Significant

All factors have computed values of 8.26, 7.98 and 8.93, respectively, were greater than the tabular value of 7.82 at 0.05 level of significance. Therefore, the null hypothesis is rejected. This implies that age, occupation and educational background of the patients significantly influence their practices on antibiotic use. The result of the geographical location/distance from home with computed value of 7.68 and tabular value of 9.84 and socio-economic status with computed value of 0.67 and tabular value of 0.81, were lesser than the tabular values at 0.05 level of significance. Hence, the null hypothesis is accepted. Thus, there is no significant relationship between geographical location/distance from home and socio- economic status and the practices on antibiotic use. This can be concluded that geographical location/distance from home and socio-economic status of the patients does not affect their practices on antibiotic use.

The study of Ref. [15] explained the association between general socio-demographic characteristics with knowledge, attitudes, and practices regarding antibiotic use. It was revealed that there were significant associations between practice with age, education, occupation, and gender. Female, younger age group, person who were Buddhism, person with higher education tends to had better practices regarding antibiotic use.

Table 7 shows the personal factors that influence antibiotic use, which gained an average weighted mean of 3.80 with a verbal interpretation of high influence.

Table 7. Personal Factors Influencing Antibiotic Use

No	Indicators	WM	Interpretation	Rank
1	High drug cost	4.42	Very High influence	2
2	Financial problem	4.24	Very High influence	1
3	Personal beliefs/ attitudes/ practices toward medicate use	3.83	High influence	3
4	Lack of access to proper health care	3.31	Moderate influence	5
5	Unable to understand and remember medication instruction	3.39	Moderate influence	4
	Average Weighted Mean	3.80	High influence	

From the data, among the personal factors that influence the use of antibiotics, the financial aspect earned the highest weighted mean. It implies that patients are financially handicapped to support their health care needs, specifically on medication needs, and only availed of the rural health units' services. The fact that patients of rural areas often experience

lower access to healthcare limit their abilities to obtain the healthcare they need and are discouraged from seeking assistance from health facilities and tend to self-medicate or look for other options.

The study of Ref. [16], financial constraints, the cultural beliefs/concept of "hiyang", discontinuation of antibiotic upon relief of symptoms and allocation for other forms of treatment are the factors curtailing the patient's ability to purchase full course of antibiotics.

Supported by the study of Ref. [17] found out that the major reason for not buying the prescribed number of antibiotics was financial in both surveys of the urban and rural Philippines communities (60% and 91.4%, respectively.) However, residents in the rural area were noted to buy slightly more tablets/ capsules of antibiotics per drugstore visits, considering that rural residents are more likely to stock up on drugs in their homes for future use or for their own stores.

Table 8 presents the environmental factors that influence antibiotic use. It gained an average weighted mean of 3.50 interpreted as high influence.

Table 8. Environmental Factors Influencing Antibiotic Use

No	Indicators	WM	Interpretation	Rank
1	Cultural beliefs that generic drugs are low quality medicine	3.61	High influence	3
2	Belief that antibiotics can cause allergy	3.08	Moderate influence	5
3	Timely transport to health care facilities to obtain antibiotica	3.63	High influence	2
4	Usually antibiotics are nearly expired	3.39	Moderate influence	4
5	Lack of knowledge and information on antibiotics	3.80	High influence	4
	Average Weighted Mean	3.50	High influence	

Based on the above findings, it was revealed that the highest percentage of antibiotic use influencing environmental factors is the lack of knowledge and information on antibiotics. It implies that basic knowledge of antibiotic and antibiotic resistance among patients would go a long way in ensuring appropriate use; thus, spreading knowledge will increase the awareness and lessening the desire for antibiotics and prevention of infection. It can be inferred that health education is an important factor that will improve patients' awareness and knowledge, reducing excessive use, thus preventing the harmful effects caused by inappropriate use of antibiotics.

Ref. [18] revealed that poor awareness leaves the people uninformed about the potentially adverse effect of these medicines. Improved knowledge of antibiotics and the problem of resistance and a better understanding of beliefs, concerns, and expectations from both the physicians and patients' perspectives are fundamental for controlling antibiotic use.

Table 9 displays the socio–economic factors that influence antibiotic use with an average weighted mean of 3.63, interpreted as high influence.

Table 9. Socio-economic Factors Influencing Antibiotic Use

No	Indicators	WM	Interpretation	Rank
1	Inadequate of finance to purchase branded drugs	3.85	High influence	2
2	Taking antibiotics not prescribed due to lack of funds	3.92	High influence	1
3	Asking others who previously take antibiotics	3.38	Moderate influence	4
4	Do not consult a doctor and use sme kind of antibiotics	3.63	High influence	3
5	Asking for free antibiotics during medical missions	3.37	Moderate influence	5
	Average Weighted Mean	3.63	High influence	

The findings revealed that financial inadequacy has a high percentage influence on antibiotic use among the socio-economic factors. The patients do not afford medicines because many antibiotics are expensive, indigent patients purchase incomplete regimens, and discontinue treatment before the bacteria is eliminated. The respondents intended to use antibiotic prescription not being prescribed, which is considered to be predictors of actual self –medication due to lack of funds.

It was revealed in the study of Ref. [19], which tackled on irrational use of antibiotics and antibiotic resistance in Southern Rural Bangladesh where most of the people live under the poverty line that people are encouraged to buy drugs from unofficial distributors because drugs are often not available in government hospitals. Moreover, many people, especially the poor, largely rely on informal healthcare providers and factually, they are not qualified enough to offer quality health services for the community. However, the patients have access to the drug, both non – prescription, including nutritional supplements and over- the-counter (OTC) drugs, and prescription items. Irrational use of these agents is associated with allergic reactions, toxicities, superinfection, and, more importantly, antimicrobial resistance development.

Table 10 to Table 12 are the statistical test results that determined if there is a significant relationship between the factors influencing antibiotic use and the knowledge, attitudes and practices using Kendall's Coefficient of Concordance. Table 10 displays the relationship between the factors influencing antibiotic use and the patients' knowledge.

Table 10. Relationship between the Factors Influencing Antibiotic Use along Knowledge

Factors	Computed Value	Tabular Value at 0.05	Decision on H0	Interpretation
Personal	9.94	9.84	Rejected	Significant
Environmental	10.03	9.84	Rejected	Significant
Socio-economic	11.06	9.84	Rejected	Significant

The statistical test result showed that personal, environmental, and socio- economic factors that influence the antibiotic use with computed values of 9.94, 10.03, and 11.06, respectively, were higher than the tabular value of 9.84 at 0.05 level of significance. Therefore,

the null hypothesis is rejected. It implies that personal, environmental, and socio-economic factors that influence antibiotic use affect patients' knowledge on antibiotic use.

Table 11. Relationship between the Factors Influencing Antibiotic Use along Attitudes

Factors	Computed Value	Tabular Value at 0.05	Decision on H0	Interpretation
Personal	9.98	9.84	Rejected	Significant
Environmental	10.08	9.84	Rejected	Significant
Socio-economic	9.88	9.84	Rejected	Significant

Table 11 exhibits the relationship between the factors influencing antibiotic use and the attitudes. Findings revealed that the personal, environmental, and socio-economic factors that influence antibiotic use with computed values of 9.98, 10.08, and 9.88, respectively, exceed the tabular value of 9.84 at 0.05 level of significance. Therefore, the null hypothesis is rejected. It implies that personal, environmental, and socio-economic factors that influence antibiotic use have a significant relationship on the attitudes of the patients on antibiotic use.

Table 12. Relationship between the Factors Influencing Antibiotic Use along Practices

Factors	Computed Value	Tabular Value at 0.05	Decision on H0	Interpretation
Personal	10.04	9.84	Rejected	Significant
Environmental	11.08	9.84	Rejected	Significant
Socio-economic	9.96	9.84	Rejected	Significant

Table 12 shows the relationship between the factors influencing antibiotic use and the practices. The data show that the personal, environmental, and socio-economic factors that influence antibiotic use obtained computed values of 10.04, 11.08, and 9.96. All are greater than the tabular value of 9.84 at 0.05 level of significance. Therefore, the null hypothesis is rejected. It implies that personal, environmental, and socio- economic factors that influence antibiotic use is found to be significantly related on the patients' practices on antibiotic use.

A focused group discussion was conducted which identified the personal, environmental, and socio-economic factors that influence patients on the inappropriate use of antibiotics. On the personal factors, they explained:

> *". . . hindi ako bumibili ng antibiotic na nireseta ng doktor dahil hindi sapat ang pera ko na pambili ng gamot dahil na din sa mahal ang mga ito."*
> (". . . I don't buy antibiotics prescribed by the doctor because I don't have enough money to buy medicine because they are expensive.")

> *". . . humihingi ako ng antibiotic sa aking kapamilya kung mayroon sila."*
> (". . . I ask my family members for antibiotics if they have them.")

> *". . . hindi ko maintindihan ang ibang paliwanag ni doktor, hindi din maintindihan ang sulat ni doktor."*
> (". . . I don't understand the doctor's other explanation, nor can I understand the doctor's letter.")

". . . kalimitan sa barangay health station wala naman silang gamot sa impeksyon."
(". . . usually at the barangay health station they don't have medicine for the infection.")

On the environmental factors, they said:

". . . wala naman akong natatanggap na kahit anong babasahin tungkol sa antibiotic. At wala man lang nakalagay na kahit anong impormasyon sa mga barangay health station tungkol sa antibiotic."
(". . . I didn't receive anything to read about antibiotics. And there is not even any information posted in the barangay health stations about antibiotics.")

". . . nakakabili ako ng antibiotic sa mga maliliit na botika o kaya sa mga tindahan sa aming barangay."
(". . . I can buy antibiotics in small pharmacies or in stores in our barangay.")

". . . generic drug lang ang binibili kong antibiotic, hindi yung branded na gamot." (". . . I only buy generic drugs for antibiotics, not the branded drugs.")
". . . hindi ko alam kung expired na ang antibiotic dahil hindi ko alam kung saan yan nakikita lalo na kung ilang piraso lang ang binibili." (". . . I don't know if the antibiotic has expired because I don't know where to see it, especially if only a few pieces are bought.")

On the socio – economic factors, they reasoned out:

". . . hindi ko naiinom araw – araw ang antibiotic, dahil kulang ang nabibili ko at mahal din ang mga branded na antibiotic."
(". . . I can't take antibiotics every day, because I can't buy enough and branded antibiotics are also expensive.")

". . . pag mayroon uli akong impeksyon yung dating nireseta ni doktor ang iniiinom ko dahil may natira pa naman ako na antibiotic."
(". . . when I have an infection again, the doctor prescribed what I take because I still have some antibiotics left.")

". . . kapag hindi ako gumagaling, nagtatanong ako sa mga kakilala ko kung ano ang iniinom nilang gamot."
(". . . when I'm not getting better, I ask people I know what medicine they're taking.")

". . . minsan, pag mayroong medical mission, kahit wala akong nararamdaman ngpapakunsulta ako, para lang mabigyan ng libreng gamot."
(". . . sometimes, when there is a medical mission, even if I don't feel anything I will consult, just to be given free medicine.")

The patients' responses indicated that personal, environmental and socio–economic factors influence patients' knowledge, attitudes, and practices on antibiotic use. This implies that there is a need to improve their understanding on the appropriate use antibiotics.

The study's result indicated the development of easy-to-understand patient educational material appropriate to patients' level of education which can help address patients' incorrect perceptions on appropriate antibiotic use and expand their understanding of the factors associated with inappropriate use.

As an output of the study, these educational materials will be a guide intervention to decrease the misconceptions or erroneous beliefs held by the patients. The need for communication support material to help healthcare providers towards quality care services in

the Rural Health Units provides health education to give patients detailed explanations when an antibiotic is or is not needed to treat illness.

There is a need for active participation of the patients in whatever health care activities to increase their knowledge to properly understand the guidelines on the prudent use of antibiotics and the ill- effect of non-adherence to its proper use. Rural health personnel may conduct patients' antibiotic awareness evaluation as baseline data to address the antibiotic medication treatment needs. Rural Health Unit personnel should have intensive antibiotic information dissemination and efficient Information, Education Campaign (IEC) to influence patients to improve health literacy to increase health awareness and consciousness. Improve communication about antibiotic appropriateness between healthcare professionals and patients. There is a need for capacity building to implement infection prevention and control activities in healthcare settings. Rural Health Unit Personnel must conduct health teaching, counselling, focused group discussion, and promotion campaigns to eliminate patients' misconceptions and implement positive behaviour change initiatives to empower the community to use antibiotics rationally. The benefits of using generic drugs and giving health assistance and support on suitable alternatives on antibiotics for the self- medication treatment should be explained to the patients. Department of Health Personnel should strengthen antibiotic resistance awareness information by explaining when antibiotic use is appropriate and not. The distribution of the Educational Materials on the S4 Use of Antibiotics: Guide Intervention Materials to Optimum Wellness to highlight the harmful effects of self–prescription and the appropriate use of antibiotics to reduce self– medication practices.

Conclusion

Most of the patients were 19 to 28 years old, housewives, high school graduates, living 501 meters to 3.0 kilometres away from RHU, and the majority are 4P's beneficiaries. The patients' level of awareness was moderate in terms of knowledge, attitudes, and antibiotic use practices. Age, occupation, and educational background found significant to the knowledge and practices on antibiotic use, while on the attitudes on antibiotic use, age, and educational experience showed significance. The majority of the patients were highly influenced by antibiotic use by the financial problem of personal factors, environmental factors, the lack of knowledge and information on antibiotics and socio-economic factors, taking antibiotics not prescribed due to lack of funds. The personal, environmental, and socio- economic factors that influence antibiotic use are significantly related to the patients' knowledge, attitudes, and antibiotic use practices. The educational materials developed in the study may enhance the level of awareness upon its utilization during educational campaign and patients counselling.

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