JOURNAL OF INTERDISCIPLINARY PERSPECTIVES

ISSN Print: 2984-8288, ISSN Online: 2984-8385
Vol. 2, No. 8, pp. 92-98, August 2024

Prevalence of Consumers Purchasing Antibiotic Medicine Without Prescription Among Community Pharmacies

Ronnel C. Garcia*, Claudette M. Tugna
School of Pharmacy, Emilio Aguinaldo College Cavite, Dasmarinas Cavite, Philippines

*Corresponding Author Email: ronnel.garcia059@gmail.com

Date received: June 5, 2024
Date revised: June 17, 2024
Date accepted: June 22, 2024

Originality: 97%
Grammarly Score: 99%
Similarity: 3%

Recommended citation:
Garcia, R., Tugna, C. (2024). Prevalence of consumers purchasing antibiotic medicine without prescription among community pharmacies. *Journal of Interdisciplinary Perspectives*, 2(8), 92-98.
https://doi.org/10.69569/jip.2024.0264

Abstract. According to the Global Research on Antimicrobial Resistance, the Philippines has an average antibiotic use of 5.3 DDDs per 1,000 people, with pediatric antibiotic use constituting approximately 56.2%. Although lower than in neighboring countries, this level of use still poses a significant threat to the healthcare system. The widespread availability of antibiotics has been a major contributing factor to the rise of antibiotic resistance (ABR) in the Philippines. Historically, antibiotics could be purchased without a prescription from local pharmacies. This study examined the prevalence of consumers attempting to purchase antibiotics without a prescription in Carmona, Cavite. Utilizing quantitative descriptive and correlational research methodologies, the study employed convenience sampling due to the limited number of community pharmacies and their tendency to cluster in specific areas. A structured survey questionnaire was used to gather data and analyze correlations between variables. Findings indicate that the majority of consumers in Carmona, Cavite, frequently attempt to obtain antibiotics without a prescription, with a preference for penicillin-class antibiotics. The reasons for these purchases vary, including self-medication for minor illnesses, treatment for pets and poultry, and topical wound care. The results underscore the importance of community education and engagement on the risks of ABR. The study suggests that local government educational programs can enhance consumer awareness of the need for prescriptions. The findings indicate that awareness of prescription requirements moderately affects the frequency of attempting to buy antibiotics without a prescription. However, no significant association was found between the reasons for obtaining medicine without a prescription and the type or class of medicine purchased.

Keywords: Antibiotics; Antibiotic resistance; Prescription medication; Community pharmacy; Healthcare.

1.0 Introduction

The advent of antibiotics revolutionized the field of medicine. What should have been a fatal wound because of an infection has been treated as nothing but a scratch nowadays. According to the data gathered by Global Research on Antimicrobial Resistance, the average global antibiotic consumption in 2018 hovers around 14.3 DDDs (Defined Daily Dosage) per 1,000 population from 9.8 DDDs per 1,000 people in 2000, translating to a 46% increase in average antibiotic consumption. According to the same index, the Philippines has an average of 5.3 DDDs per 1,000 people, with around 56.2% of which is for antibiotic usage in children.

Indiscriminate antibiotic use poses a significant threat to the healthcare system. A once powerful weapon is being rendered obsolete due to ABR (Antibiotic Resistance). According to Saleem et al. (2021), the growing rates of ABR are now increasing worldwide morbidity, mortality, and costs. ABR is attributed to the misuse and overuse of antibiotics, which stems from the lack of knowledge, careless use, and outdated beliefs of consumers about

antibiotics (Karuniawati et al., 2021). Furthermore, in addition to increasing the cost of healthcare, ABR poses a threat to other industries such as agriculture and waste management as antibiotic use in animal products increases.

The most contributing factor to the rise of ABR in the Philippines is the previously unregulated availability of antibiotics. Before the implementation DOH-FDA Advisory No. 2012-017, anyone can just show up in a community pharmacy to purchase antibiotics. Nowadays, however, a physician's prescription is required as per DOH-FDA Advisory No. 2012-017, with the help of the strengthened R.A. 10918 or the Philippine Pharmacy Act. This combination of laws helped mitigate the problem; however, due to Filipinos' outdated beliefs, indiscriminate antibiotic use persists, and community-level antibiotic use remains uncertain, as some community pharmacies continue to dispense these medications even without a prescription (Saito et al., 2018).

Research on indiscriminate dispensing of antibiotics without a prescription at community pharmacies reveals significant gaps and challenges. Despite existing laws and regulations prohibiting the sale of antibiotics without a prescription, non-compliance by pharmacy providers is widespread (Ndaki et al. 2021). A study done by Fernandez (2021) indicates that recommendations for public education on antibiotic use are needed to be developed to solve the lack of understanding of antibiotic resistance. A deeper understanding of indiscriminate antibiotic use is required to establish whether patients' use patterns are congruent with optimal treatment techniques. Therefore, public education regarding the proper use of these medications is needed to enhance healthcare outcomes.

The involvement of community pharmacists is crucial in the fight against ABR. Community pharmacies are healthcare institutions where pharmacists distribute drugs, advise patients on medication use, and provide a variety of health-related services. These pharmacies are critical components of the healthcare infrastructure, acting as a link between patients and the larger healthcare system by providing crucial services and enhancing public health outcomes. They are the most accessible to the general public, and they can educate customers about the risks of the ABR. This research explored the prevalence of over-the-counter antibiotic purchases without a prescription in community pharmacies in Carmona Cavite.

2.0 Methodology

2.1 Research Design

The study focused on quantitative descriptive and correlational research methods, intended to determine if there is a correlation between the consumer's frequency of purchase of antibiotics without a prescription and the consumer's level of awareness. The study utilized a structured survey questionnaire to address the study's objectives and established a correlation between each variable. The research used convenience sampling due to the limitations on the number of community pharmacies in the city and their tendency to concentrate on a handful of areas in the city. This ensured that the research gathered as many participants as possible.

2.2 Research Locale

The study focused on Carmona Cavite, Philippines. The city has a population of 106,256 according to PhilAtlas in 2021. This population is spread among 14 barangays. Carmona is a relatively new city, with its status being upgraded last July 8, 2023, and with it, comes the traditional approach and beliefs in medicine.

2.3 Research Participants

The study focused on registered community pharmacies in the city as research participants. A total of 16 community pharmacies participated in this study. The study used a convenience sampling strategy. Participants were chosen based on whether they met onsite or online criteria.

2.4 Research Instrument

The research used a survey questionnaire as a research instrument, with the survey used in the study of Ahmad et al. (2022) being the basis and was modified by being synthesized with the study of Karuniawati et al. (2021) and Ndaki et al. (2021). The results were gathered using an online survey utilizing Google Forms and by onsite approach to community pharmacies. The online poll was distributed to acquaintances via social media, with direct or indirect contact to qualifying community pharmacies. The onsite survey involved physically approaching

community pharmacists to answer the questions and sending the surveys to several barangays in Carmona, Cavite.

The questionnaire included Poka-Yoke features to ensure that the responses were as accurate as feasible. Poka-Yoke aspects prevent mistakes by providing prepared responses, such as multiple-choice questions. The questionnaire consisted of questions like frequency of antibiotic purchase attempts, reason for purchase, antibiotic drug/class being purchased, and assessment of the awareness of the consumers/patients about the prescription requirement for purchasing antibiotic

The validation of the questionnaires was done by submitting the instrument to three different independent validators, with all 3 validators being practicing community pharmacists. The research instrument was judged using 7 different criteria, namely; Clarity of Language, Presentation of Topics, Sustainability of Terms, Adequateness of Purpose, Attainment of Purpose, Respondents' Friendliness, and Objectivity, in which it received a score of 35/40 (Validator 1), 38/40 (Validator 2), and 30/40 (Validator 3) respectively, having an overall score of 34.33/40. Using SPSS to calculate the Cronbach's Alpha, the coefficient value resulted in $\alpha = 0.7778$, translating that the testing instrument was in "Acceptable" Consistency.

2.5 Data Gathering Procedure and Analysis

On-site participants were chosen immediately by approaching them. For the online survey, the researchers distributed the survey form to several contacts who live in Carmona Cavite and know a community pharmacist who is currently working in the city.

For the statistical analysis of the data, Spearman's rank correlation coefficient test was employed to examine the relationship between consumer awareness and their reasons for purchasing. This test yields a correlation coefficient (r) ranging from +1 (indicating a positive correlation) to -1 (indicating a negative correlation), assessing both the strength and direction of the relationship between variables. The coefficient (ρ) indicates how well the data points fit a linear relationship between the variables.

Additionally, the relationship between the reason for purchase and the type or class of antibiotic drug purchased was investigated using the chi-square test. According to Garcia and Duhan (2024), the chi-square test is most effective when observed results align with expected outcomes, thereby confirming that observations are not random. This test is particularly suitable for analyzing categorical variables and assessing goodness of fit between expected and observed frequencies, as well as the independence of two criteria for qualitative variables.

2.6 Ethical Considerations

This research study followed ethical guidelines. Participants in this study provided their complete agreement to participate, and they had the option to withdraw or have their responses redacted at any time. The participating respondents encountered no risks all through the study's implementation. The researchers were responsible for any confidentiality violations that happened during the research process. To ensure the confidentiality of the information gained, only the researchers and statistician had access to the collected data. All study data contained on the drive was to be kept strictly secret and used only for research purposes and be disposed of once the study was completed.

3.0 Results and Discussion

3.1 Frequency of Purchasing Antibiotics Without a Prescription

Table 1 shows that in the community pharmacy setting, the majority of pharmacists encounter consumers trying to purchase antibiotic medicine multiple times a day (N = 6, 37.5% of the responders), with another 25% (N = 4) saying that they encounter consumers purchasing at least once a day. Only 2 pharmacies (12.5% of the responders) said that they never encounter consumers trying to purchase antibiotic medicine without a prescription, with another pharmacy (N =1, 6.3%) saying that they only encounter such purchases at least once a month.

Table 1. Descriptive statistics of the frequency of purchasing antibiotic without a prescription

Frequency of Purchase	Frequency	Percentage (%)
1 – Never	2	12.5
2 – Rarely	1	6.3
3 - Sometimes	3	18.8
4 – Often	4	25.0
5 – Very Often	6	37.5
Total	**16**	**100.0**

These findings are consistent with broader research indicating that consumers attempting to acquire antibiotics without a prescription are common in many parts of the world despite regulations intended to prevent this activity, according to Ahmad et al. in 2022. The frequency with which antibiotics are purchased without a prescription in Carmona's community pharmacies underlines the need for further public health involvement. These could include educational programs to raise awareness about the risks of antibiotic overuse and the significance of following prescription guidelines.

3.2 Common Reasons for Purchasing Antibiotics Without a Prescription.

Table 2. Descriptive statistics of the common reason for purchasing without prescription

Reason	Frequency	Percentage (%)
For self-medication (Treatment for fevers, colds, cough)	12	29.27
For pet and poultry use	12	29.27
For topical treatment of wounds	12	29.27
Prophylaxis (prevention of illness)	3	7.32
For stockpiling/Replenishment of supply	2	4.87
Total	**41**	**100**

With regards to the typical reason why the consumers tried to purchase antibiotics without a prescription, 12 Pharmacies (75% of the responders) said that the consumers used them for 3 reasons. (1) for self-medication on minor ailments such as fevers, colds, and coughs, (2) for pet and poultry use, and (3) for topical treatment of wounds. Other minor reasons include prophylaxis to prevent illness (18.8% of the responders) and for stockpiling/replenishment of supply (12.5% of the responders).

According to a study by Robredo et al. in 2022, self-medication is prevalent. At least 31% to 66% of Filipinos practice some kind of self-medication. Self-medication is one of the top reasons for purchasing antibiotics without a prescription at the community level in Carmona Cavite. Along with using antibiotics for pets and poultry and topical application of wounds, this can be a contributing factor in the rise of ABR.

3.3 Common Antibiotics Purchased by Consumers.

Table 3. Descriptive statistics of the common antibiotics being purchased by the consumers

Antibiotic Drug/Class	Frequency	Percentage (%)
Penicillin (e.g. Amoxicillin)	16	29.09
Macrolide (e.g. Azithromycin, Erythromycin)	7	12.73
Cephalosporin (e.g. Cephalexin, Cefdinir)	7	12.73
Fluoroquinolone (e.g. Ciprofloxacin, Levofloxacin)	4	7.27
Beta-lactam with Combination (e.g. Co-amoxiclav)	8	14.54
Tetracycline (e.g. Tetracycline, Doxycycline)	3	5.46
Trimethoprim-Sulfamethoxazole	2	3.64
Lincosamides (Clindamycin)	8	14.54
Total	**55**	**100**

Table 3 indicates that Penicillin was the preferred antibiotic class purchased without a prescription across all 16 community pharmacies surveyed (100% of respondents). Beta-lactam antibiotics and Lincosamides tied for second place, with eight pharmacies each (50% of respondents) reporting consumer attempts to purchase these antibiotics. Additionally, seven pharmacies (43.8% of respondents) noted the popularity in purchasing macrolides and cephalosporins without a prescription. In contrast, only two pharmacies (12.5% of respondents) reported attempts to purchase Trimethoprim-Sulfamethoxazole.

In a study by Fenta et al. conducted in 2022, it was found that 49.6% of gram-negative bacteria isolates, 46.2% of S. pneumoniae isolates, 28.6% of S. pyogenes isolates, and over 49% of S. aureus isolates were resistant to penicillin. Being the top drug of choice for consumers purchasing antibiotics without a prescription, it can be attributed to the rising levels of ABR, and it can render the penicillin antibiotic drug class obsolete in the future. According to this study however, Lincosamides and Beta-lactams were still effective against isolated bacteria species.

3.4 Awareness of Laws and Regulations Relating to Prescription for Purchasing Antibiotics.

Table 4. Descriptive statistics of the awareness of the consumers in the prescription requirements of purchasing of antibiotics

Level of Awareness	Frequency	Percentage (%)
1 – Not Aware	2	12.5
2 – Somewhat aware but have limited knowledge (e.g. restrictions only for certain types of antibiotics)	11	68.8
3 - Fully aware but still chose to buy	3	18.8
Total	**16**	**100.0**

Table 4 indicates that most consumers attempting to purchase antibiotics without a prescription in community pharmacies were somewhat aware of the prescription requirements (11 pharmacies, accounting for 68.8% of the respondents). The majority of these consumers mistakenly believed that the requirement applies only to specific antibiotics, not universally. Only two community pharmacies (12.5% of respondents) reported that consumers were completely unaware of the prescription requirement, while three pharmacies (18.8% of respondents) noted that consumers were fully aware but still chose to purchase without a prescription.

This misconception among consumers underscores a significant gap in public knowledge regarding the consistent application of prescription requirements across all types of antibiotics. In a study by Ornos et al. (2022), it is emphasized that there is a critical need for targeted educational initiatives aimed at improving public awareness about the prescription requirements for antibiotics. These efforts should concentrate on dispelling misconceptions and fostering a thorough understanding of the legal and health implications associated with antibiotic misuse.

3.5 Relationship Between Consumer's Awareness and Frequency of Purchase without Prescription

Table 5. Correlation analysis of the consumer awareness and the frequency of purchase

			Frequency	Awareness
Spearman's rho	**Frequency**	Correlation Coefficient, ρ	1.000	0.434
		Sig. (2-tailed) (p-value)	0.000	0.093
		N	16	16
	Awareness	Correlation Coefficient, ρ	0.434	1.000
		Sig. (2-tailed) (p-value)	0.093	0.000
		N	16	16

Based on the results from Table 5, there is a moderate correlation between the frequency of purchasing antibiotics without a prescription and consumers' awareness of prescription requirements ($\rho = 0.434$, p-value = 0.093). This indicates that consumers' awareness of prescription requirements moderately influences how often they attempt to buy antibiotics without a prescription.

According to a study conducted by Saleem et al. (2021), antibiotics were frequently dispensed in community pharmacies. Given the high frequency of purchasing antibiotics without a prescription and consumers' varying levels of awareness regarding prescription requirements, the risk of Antibiotic Resistance (ABR) in the community of Carmona, Cavite, is notably high. Ensuring comprehensive public education could significantly reduce the prevalence of ABR. Increased awareness of prescription policies is crucial in affecting how frequently consumers purchase antibiotic medication.

3.6 Relationship Between Reason for Purchase and Type of Antibiotic Purchased

Table 6. Analysis for the relationship between reason for purchase and the type of antibiotic purchased

	Value	df	p-value
Pearson Chi-Square	69.067	80	0.803
Likelihood Ratio	42.810	80	1.000
Linear-by-Linear Association	0.590	1	0.442
N of Valid Cases	16		

Based on Table 6, the chi-square value of 0.803 ($p > 0.05$) indicates that there is no relationship between the reason for purchasing antibiotics without a prescription and the class of antibiotics being purchased. This implies that the reasons consumers choose to buy antibiotics without a prescription do not vary significantly based on the type of antibiotic they purchase. For example, whether a consumer opts for penicillin or another class of antibiotics, the underlying reasons (such as self-diagnosis or advice from non-medical sources) do not differ significantly across these categories.

4.0 Conclusion

The study findings revealed that the majority of consumers in Carmona, Cavite, frequently attempt to purchase antibiotic medications without a prescription, with antibiotics from the penicillin class being their drug of choice. The reasons for these purchases vary widely, from self-medication for minor ailments to use in pets and poultry, and even topical application for wounds. This underscores the importance of community education and engagement regarding the dangers of antibiotic resistance (ABR). The results suggest that efforts to educate the public through local government programs can increase consumer awareness about the necessity of prescriptions.

The study also found that awareness of the prescription requirement moderately influences how often consumers purchase antibiotics without a prescription. However, there is no significant relationship between the reasons for purchasing medication without a prescription and the type or class of medicine being bought.

The research reveals general behaviors and attitudes towards indiscriminate antibiotic use, emphasizing the need for comprehensive public health education and policy strategies to combat misuse and reduce antibiotic resistance development. The findings underscore the necessity of a holistic approach to address antibiotic misuse, including widespread educational campaigns to correct misconceptions about antibiotics, stricter regulations on antibiotic sales, and improved healthcare access to lessen the need for self-medication.

Further research is needed to explore additional factors such as the socio-demographic profiles of consumers attempting to purchase antibiotics without prescriptions. Gathering such data can provide deeper insights into the underlying motivations driving these behaviors.

It is also recommended to expand the research to neighboring towns and cities to account for factors such as the residents of Carmona purchasing antibiotics in nearby towns like GMA, Cavite, or residents of Binan, Laguna, buying antibiotics in Carmona. This could significantly impact research outcomes since these areas were not included in the current study.

Additionally, incorporating perspectives from hospital pharmacists is crucial for a comprehensive assessment of antibiotic purchase without prescriptions. Involving pharmacies in clinics and hospitals will provide a more holistic understanding of the issue.

Understanding each of these factors is crucial for improving the policymaking process aimed at combating the rise of antibiotic resistance.

5.0 Contributions of Authors

Ronnel Garcia – Conception of the topic, writing of the introduction and methodology, supervising the data analysis for results and discussion, editing of the manuscript for revisions.
Claudette Tugna – Conception of the topic, writing of the results and discussion, writing of the conclusion, data gathering (online and onsite data gathering), data analysis using SPSS.

6.0 Funding

There is no funding agency for this research

7.0 Conflict of Interests

There was no conflict of interest to declare in this study.

8.0 Acknowledgment

We want to express our deepest gratitude to the following people for being with us in every effort throughout this challenging and exciting journey:

To our participants, the community pharmacies in Carmona Cavite, for the data that they have provided.

To Professors Aldrix Guevarra and Miguel Patriarca, for their support in the creation of this study. Their ideas were of great help for the conceptualization of the study.

To Professors Frederick Francisco and Ariel Geno Santos, for their insights. Their consults were of great help in the formation of the survey for this study.

To Ms. Judea Moralidad, for her consults in statistical treatment of data and support in ensuring that this study follows the highest statistical standard.

Thank you very much, this work is dedicated to you all.

9.0 References

Ahmad, T., Khan, F. U., Ali, S., Rahman, A. U., & Khan, S. A. (2022). Assessment of without prescription antibiotic dispensing at community pharmacies in Hazara Division, Pakistan: A simulated client's study. PLOS ONE, 17(2), e0263756. https://doi.org/10.1371/journal.pone.0263756

Fenta, F., Alemu, D., & Alelign, D. (2022). Magnitude of drug-resistant gram-positive bacterial pathogens, and its associated factors from external ocular infected patients attending at Jinka General Hospital Ophthalmic Clinic, Southern Ethiopia. Dovepress, 15, 947–959. https://doi.org/10.2147/IDR.S356974

Fernandez, R. A. V. (2021). Awareness on the use of antibiotic and over-the-counter (OTC) drugs among selected residents in Cabaluay, Zamboanga City. Science Asia Review, 4, 33-56.

Garcia, R. C., & Duhan, D. A. V. (2024). Perception of senior citizens on paid value-added community pharmacy services in Dasmarinas, Cavite. Ignatian International Journal for Multidisciplinary Research, 2(5), 2632-2653. https://doi.org/10.5281/zenodo.11393778

Global Research on Antimicrobial Resistance. (2018). Global antibiotic consumption & use. Retrieved from https://www.tropicalmedicine.ox.ac.uk/gram/research/visualisation-app-antibiotic-usage-and-consumption

Karuniawati, H., Hassali, M. A. A., Suryawati, S., Ismail, W. I., Taufik, T., & Hossain, M. S. (2021). Assessment of knowledge, attitude, and practice of antibiotic use among the population of Boyolali, Indonesia: A cross-sectional study. International Journal of Environmental Research and Public Health, 18, 8258. https://doi.org/10.3390/ijerph18168258

Ndaki, P. M., Mushi, M. F., Mwanga, J. R., Konje, E. T., Ntinginya, N. E., Mmbaga, B. T., Keenan, K. L., Sabiiti, W., Kesby, M., Benitez Paez, M. F., Sandeman, A. F., Holden, M., & Mshana, S. E. (2021). Dispensing antibiotics without prescription at the community pharmacies and accredited drug dispensing outlets in Tanzania: A cross-sectional study. Antibiotics, 10(8), 1025. https://doi.org/10.3390/antibiotics10081025

Ornos, E. D., Quebral, E. P. B., Ceriales, J. A., & Tantengco, O. A. G. (2022). Inappropriate antibiotic dispensing and use: A public health threat in the Philippines. Asian Pacific Journal of Tropical Medicine, 15(8), 341-342. https://doi.org/10.4103/1995-7645.354417

PhilAtlas. (2024). Carmona: Province of Cavite. Retrieved from https://www.philatlas.com/luzon/r04a/cavite/carmona.html

Robredo, J. P. G., Eala, M. A. B., Paguio, J. A., Salamat, M. S. S., & Celi, L. A. G. (2022). The challenges of combatting antimicrobial resistance in the Philippines. Correspondence, 3(4), E246. https://doi.org/10.1016/S2666-5247(22)00029-5

Saito, N., Takamura, N., Retuerma, G. P., Frayco, C. H., Solano, P. S., Ubas, C. D., Lintaq, A. V., Ribo, M. R., Solante, R. M., Dimapilis, A. Q., Telan, E. O., Go, W. S., Suzuki, M., Ariyoshi, K., & Parry, C. M. (2018). Frequent community use of antibiotics among a low-economic status population in Manila, the Philippines: A prospective assessment using a urine antibiotic bioassay. The American Society of Tropical Medicine and Hygiene, 98(5), 1512–1519. https://doi.org/10.4269/ajtmh.17-0564

Saleem, Z., Faller, E. M., Godman, B., Malik, M. S. A., Iftikhar, A., Iqbal, S., Akbar, A., Hashim, M., Amin, A., Javeed, S., Amir, A., Zafar, A., Sabih, F., Hashmi, F., & Hassali, M. (2021). Antibiotic consumption at community pharmacies: A multicenter repeated prevalence surveillance using WHO methodology. Medicine Access @ Point of Care, 5, 1–9. https://doi.org/10.1177/23992026211064714