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Frequency of Self-Medication with Antibiotics among Patients Presenting with Common Infectious Diseases

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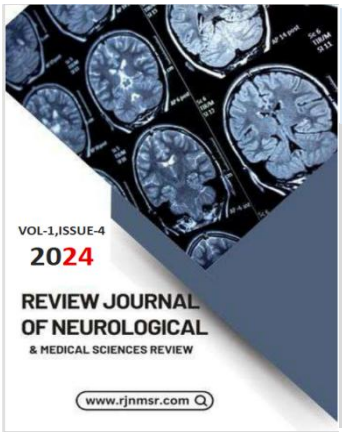
Abstract

This research study aimed to determine how often patients treated themselves with antibiotics when they came to the Department of Medicine, MTI/Lady Reading Hospital in Peshawar with common ID complaints. An explorative, cross-sectional design was used with 211 adults aged between 18 and 60 years who had acute lower GI infections and upper respiratory or lower urinary tract infections. Of these patients, the study revealed that 69.7% had engaged in self-medication with antibiotics in the previous 6 months to admission. The highest level of self-medication reported in the respondents was reported in gastro-enteritis (74.7%), respiratory tract infections (68.5%), and urinary tract infections (61.5%). The augmented choice of antibiotics was amoxicillin at 38.1%, ciprofloxacin at 22.4%, and metronidazole at 19.7%. Self-medication or the use returned by purchase accounted for 52.4% of the antibiotic prescriptions at community pharmacies. Multiple logistic regression analysis revealed that secondary education (OR=2.31, 95% CI: 1. Age (χ2: 43-3.72), employment status (χ2=1.76, 95% CI: 1.15-2.69), and previous antibiotic experience (χ2=2.87, 95% CI: 1.89-4.36) were the demographic variables that explained self-medication behavior. 45 of them reported clinical improvement by discharge, of which 43.5% had clinical improvement, and 21.8% developed clinical deteriorations or complications. The findings underscore the need for bias extension for addressing antibiotic self-medication, and its contribution toward IMR.



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Keywords: Self-treatment with antibiotics, diseases, resistance to antimicrobials, access to healthcare, prescription, patients, population health

Introduction

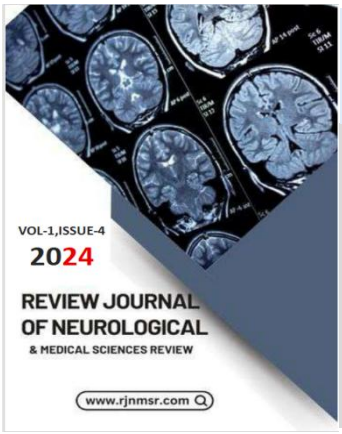
Antimicrobial resistance is among the most serious public health challenges of our time, risking to reverse decades of medical progress (Marston et al., 2016). The continual evolution of bacteria to resist the mechanisms of action of these agents decreases their effectiveness and contributes to increasing morbidity and mortality due to common infectious diseases. One of the main contributors to this growing crisis is the practice of self-medicating with antibiotics. Self-medication involves using drugs to treat conditions or symptoms that are self-diagnosed without the guidance of professionals, and it has become common in developed and developing countries alike.

Self-prescribing antibiotics is a common phenomenon that poses serious concerns in terms of potential risks to patient safety, impact on treatment success, and implications for global health (Ahmed et al., 2024). Antibiotics are taken without suitable medical advice for the most part by patients entwined in several different aspects like availability, past experiences, culture, and wealth (socio-economic status). Such practice results not only in improper use of the antibiotics but also paves the way for continued misappropriation which increases the chances of developing antibiotic-resistant strains of bacteria.

It is important to know the extent and determinants of self-medication with antibiotics to develop effective public health measures. This practice varies greatly in prevalence across populations and areas depending on education, healthcare access, and local healthcare policies (Bava et al., 2024). Alarming rates of self-medication among patients with common infectious diseases, like respiratory infections, gastrointestinal issues, and urinary tract infections, have been reported in recent studies. These conditions are often overtreated because of misunderstandings about the need and appropriateness of antibiotic therapy (Ezugwu, Gayle, & Anyamene, 2024).

This study aims to explore the self-medication practice with antibiotics among patients seeking treatment for common infectious diseases at primary care clinics. This research aims to provide insight into the demography, motivation and behaviour of self-medication by an analysis of data available till October 2023. A yes to these questions will lead to extrapolation of the findings in the context of health care providers and policymakers, as well as provide a rationale for conducting selective educational campaigns designed to limit inappropriate antibiotic utilization.

There is no understating of the importance of tackling antibiotic self-medication. With rising resistance to the last line of antibiotics, the consequences for public health systems are severe. Insufficient treatments for prevalent infections can extend hospital stays, increase medical costs, and



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result in higher mortality rates. Thus, it is crucial to comprehend the prevalence and determinants of self-medication practices to develop effective interventions to address this growing problem.

Antibiotics have played an important and crucial role in the treatment of infectious diseases caused by bacteria. However there has been inappropriale and excessive use of antibiotics both in developed and developing countriesl. The self medication is more common in low to middle income countries where antibiotic are easily available over the countep. Prevalence of self medication with antibiotics greatly varies among different countries and even within a country. Prevalence of self medication with antibiotics in IJK 4.60/03 while 40% in Jordana. A study demonstrates that about 76% of university students in Karachi self-medication, of which prevalence of self medication with antibiotics was found to be 27.

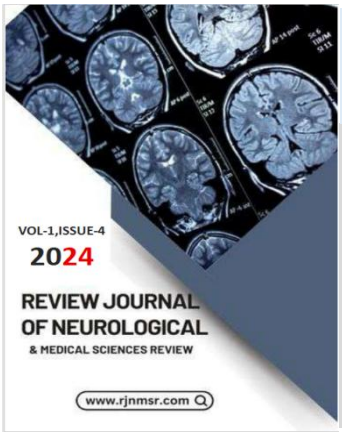
Antibiotics are used for treating common cold, a viral condition for which antibiotics treatment is inelrectivea,6. Because of economical constraints, poor people may purchase antibiotics with a low price, which can be of poor quality. They may purchase insuficient amounts of non-prescribed antibiotics. Self-prescribed antibiotic treatments are usually shorter and./ or improperly dissitisfied.

As a consequence, self-medication with antibiotics may be associated with undesirable effects, decreased effectiveness and has become an important factor driving antimicrobial resistance. Rates of antimicrobial resistance closely correlate with rates of antibiotics consumption8. Antibiotics resistance has become a worldwide public health problem. Recent studies in Europe showed high rates of outpatient antibiotics use and resistance10. The consequences of resistance are severe; infections caused by resistant microbes fail to respond to treatment, resulting in increasing morbidity and mortality/ disability and death.

Treatment failures also lead to longer periods of infectivity, which increase the numbers of infected people moving in the community and thus expose the general population to the risk of contracting a resistant of bacteria. The financial burden that resistance imposes upon health services causes more hardship in poor countries.

The two main sources of self-medicine the use of left-over antibiotics from previous courses of treatment and the acquisition from pharmacies without prescriptiontion. Drug regulations that affect the availibility of antibiotics are implemented differently in different countries and play an important role in misuse of antibioticsra. Although drug regulations are present in Pakistan but it is not implemented properly. Almost every pharmacy in pakistan sells drugs without a prescription, a phenomenon seen in many developing countries.

The aim of this study is to determine the frequency of antibiotic self-medication in our local population presenting with common infectious conditions. The rationale behind this study is that no significant study has been done in our local community, regarding self-medication with antibiotics.



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The idea behind doing this study raised in our minds while careful scrutiny of the literature in which we found that self medication with antibiotics varies between country to country and even within countries and also it is high both in developing and developed countries.

This study provides us with Iocal magnitude of self-medication with antibiotics and the results on this study will be compared with already available data over literature and will found to be significantly high, can be used as a first hand evidence in policy recommendations with regards to free availability ofon counter antibiotics.

Objective

To determine the frequency of self-medication with antibiotics among patienrs presenting with common infectious diseases.

Operational Definition

Common infectious Diseases

Gastroenteritis: Passage of three or more loose or watery stools in a 24 hours period for less than l4 days.

A loose stool being one that would take the shape of the container as give by history.

Urinary Tract Infections: It was diagnosed on urine culture showing > 105 colony forming units in the laboratory.

Respiratory Tract Infections: History of productive cough and sputum culture showing growth of any type of bacteria in the laboratory.

Self-rnedication with Antibiotics: lt was considered significant if the patient gives history of antibiotic use (after onset of symptoms for current illness) even once as a single dose not prescribed by any recognized health professional.

Literature Review

Overview of Self-Medication

One of the facts which can be potentially dangerous is the practice of self-medication. It also includes the use of over-the-counter medications, herbal remedies, or prescription drugs obtained by someone other than the person to whom it is prescribed (Jirjees et al., 2022). Self-medication allows patients to obtain treatment conveniently with little to no time lost from daily life, as most minor ailments can be treated with a visit to the drugstore instead of the doctor, but antibiotics self-prescribing, due to their nature, is a whole new beast entirely. This misuse of these potent medications not only puts individual health outcomes at risk but also fuels the global crisis in antibiotic resistance.

Self-medication with antibiotics varies considerably among countries and populations. Countries both developed and developing have documented high self-medication rates. In particular, a systematic review of self-medication practices in low-middle-income countries revealed that self-medication with antibiotics ranges from 20% to even 80%, depending on the region and context (Torres et al., 2019). In developed countries, the numbers might be

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lower, but the situation is worrying nonetheless — many people self-diagnose their ailments and turn to self-treatment for this reason.

Studies, like Sun et al. (2022), show that commonly self-medicated conditions include respiratory tract infections, gastrointestinal disorders and urinary tract infections. Many of these conditions are treated with antibiotics, even though many of them — as we all know — are viral (and, therefore, do not respond to antibiotic treatment). This practice is fueled by the common misconception that antibiotics are a cure for all types of infections, which demonstrates a key public health education gap.

There are significant differences in self-medication practices according to age, gender, and level of education. Younger people are more likely to self-medicate, perhaps because they have more access to health information on the internet, or because they have a greater chance of minor health complaints. In contrast, older adults may depend more on healthcare providers because of chronic conditions. There are also gender differences, as studies show that compared with men, women are more likely to self-medicate for a mental health concern, likely due to disparities in health-seeking behaviours (Subashini & Udayanga, 2020).

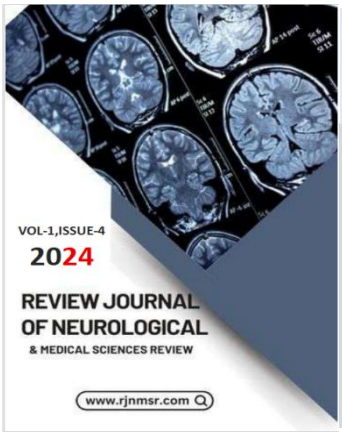
Education is yet another significant factor; a key determinant of whether someone is aware of the right way to use antibiotics or how dangerous self-medication can be is how far they got in school. This highlights the need for targeted educational programs within at-risk communities.

The significant role of socioeconomic status in health behaviours, especially self-medication (Samaan, 2024). Self-medication is a common phenomenon among individuals with lower income or without health insurance, as they may be barriers by financial constraints and limited access to healthcare services. Such practice can be considered as a coping measure contributing to the barriers to receiving medical care by professionals. The exorbitant cost of healthcare and medications in certain places can worsen this problem, resulting in higher reliance on self-medication practices.

This self-medication can be fueled by psychological factors, including an individual's beliefs and attitude toward health. Dispelling common myths about antibiotics Antibiotics are perceived by many individuals as effective against all types of infections (Tang, Millar, & Moore, 2023). This behaviour is further strengthened by previous experiences of self-medication, opening a vicious and hard-to-break cycle of misuse. Learning about correct antibiotic use is necessary to change these beliefs (Rather et al. 2017).

Tips to Prevent Self-Medication

A holistic solution to the problem of self-medication with antibiotics will be needed. Education campaigns that raise awareness about the dangers of self-medication and the need for responsible antibiotic use are vital (Chukwure & Usoro, 2023). These campaigns need to be focused on and directed towards distinct demographics, using target-driven messages that relate to the audience.



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It's also important to strengthen healthcare systems to make it easier to get primary care services. This has potential implications for self-medication practices, as decreasing access to healthcare might lead to an increase in self-medication practices. Implementing policy measures, such as regulating the distribution of antibiotics, limiting their sale, and establishing requirements for prescriptions, can further minimize the aforementioned self-medication-related risks (Rodrigues, 2020).

Self-medication with antibiotics is a major public health issue that is associated with several demographic, socioeconomic, and psychological factors as referenced in the literature (Nguyen et al. 2023). The public health implications here are serious; this practice needs to stop as quickly as possible. Knowing the prevalence of self-medication and its determinants would enable healthcare providers and policymakers to devise effective strategies for promoting responsible use of antibiotics and fighting the increasing danger of antibiotic resistance (Muwayira, 2018). While there is no shortage of research on this issue, future studies should concentrate on exploring the effectiveness of interventions and the changing landscape of self-medication practices.

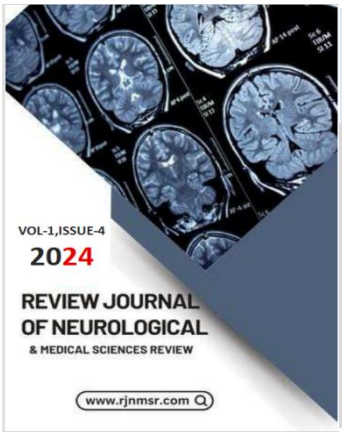
Methodology

Analysis of Self-Medication with Antibiotics

The use of antibiotics without prescription is an emerging concern for health across the globe especially in developing countries where control measures on sales of antibiotics are not rigid, and where awareness about AMR is nonexistent. Ineffective use of antibiotics also adds to antibiotic-resistant bacteria that may make it hard to treat some basic bacterial infections. This study aims to determine the level of self-medication with antibiotics among patients with gastroenteritis, respiratory tract infections, and urinary tract infections in a healthcare facility.

Understanding Self-Medication: Self-medication is the practice of taking medicinal products to treat an ailment without consulting a doctor, based on previous history, word of mouth, or easy availability of drugs without strict prescription. Unfortunately, there are few healthcare policies where self-prescribing is either practical or safe, and with antibiotics, self-medication is especially pernicious since if misused, it results in insufficient elimination of pathogens and the emergence of their resistance.

Risks of Antibiotic Self-Medication: As for the risks of antibiotic misuse, WHO has pointed to them in its reports several times.• Resistance to antibiotics, that cause diseases to be less manageable.• Uncontrolled antibiotic use as this may cause side effects on the body hence they should be taken under supervision.• Being milestones, people put great emphasis on wearing those masks concealing their serious conditions which should be treated as soon as possible.• Increased spending, especially when antibiotic use is not correct, results in expensive therapy for resistant bacterial infections. Regulations on antibiotic sales are weak, and public awareness about antimicrobial resistance is low. Overuse or misuse of antibiotics without



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medical supervision contributes to the rise of antibiotic-resistant bacteria, complicating treatment options for common infections. This study seeks to assess the prevalence of self-medication with antibiotics among patients presenting with gastroenteritis, respiratory tract infections, and urinary tract infections in a healthcare facility.

Understanding Self-Medication: Self-medication refers to the use of medicines by individuals without a prescription, often influenced by past experiences, recommendations from non-medical sources, or the availability of medicines without stringent regulations. In the case of antibiotics, self-medication is particularly dangerous, as incorrect usage can lead to incomplete eradication of pathogens and the development of resistance.

Risks of Antibiotic Self-Medication: The World Health Organization (WHO) has repeatedly emphasized the risks associated with antibiotic misuse. The practice can cause:

- Antibiotic resistance, making infections harder to treat.
- Adverse drug reactions, as antibiotics used without supervision may lead to side effects.
- Masking of symptoms, delaying appropriate treatment for serious conditions.
- Financial waste, as inappropriate use may lead to costly treatments for antibiotic-resistant infections.

Epidemiology of Self-Medication: Many researchers have targeted the proportion of individuals who use antibiotics without a prescription including developing regions. A survey conducted in Jordan revealed that 39.5% of them used antibiotics without a prescription. Ethiopian study also showed that study subjects treated 60% of the minor illnesses by self-medication and Antibiotics were commonly used for respiratory and urinary tract infections.

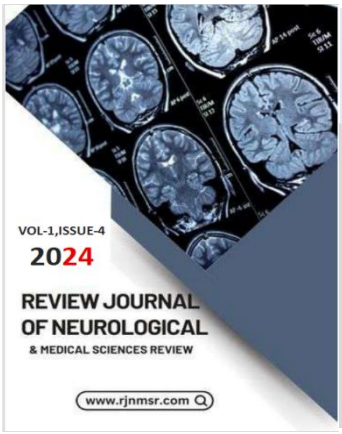
Self-medication is often driven by several factors:

1. Use of over-the-counter antibiotics.
2. They denied any awareness of the effects of the tool as per misuse.
3. Health care costs and long waiting periods.
4. Culture in some societies prescribes antibiotics to treat viral infections than supposed to.

Study Rationale

Increasing acknowledgment of improper use of antibiotics has emerged as a universal health issue, especially upper respiratory tract, gastrointestinal, and urinary tract infections in particular; therefore, this study seeks to explore self-medication practices in a hospital. RTIs, gastroenteritis, and UTIs are typical for healthcare-associated complications, and they are one of the reasons for the irrational use of antibiotics. The knowledge of the extent of self-medication practices, the reasons behind it and patients' profiles can contribute to intervention development.

Study Design This is a descriptive cross-sectional study that aims at determining the extent and type of self-administration of antibiotics among



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patients with gastroenteritis, and respiratory or urinary tract infections attending [Insert Hospital Name]. Again it will not be an experimental research as data will be collected from the patients over a period of six months.

Study Setting

The study was done at the Department of Medicine, MTI /Lady Reading Hospital in Peshawar. The participants were selected from a hospital setting and therefore represented a diverse clientele population, from different demographic and socioeconomic backgrounds; this proved beneficial in identifying a myriad of barriers to the appropriate use of medicines.

Study Population

Patients between 18 and 60 years of age presenting with Gastroenteritis, and respiratory or Urinary tract infections were the study population. Both male and female patients were taken into consideration.

Criteria	Details
Age Range	18 - 60 years
Gender	Both male and female
Conditions Presented	Gastroenteritis, respiratory, or urinary tract infections
Exclusion Criteria	Pregnant women, patients with chronic diseases or malignancy

Sample Size Calculation: In this study, the sample size was determined by Sample Size Determination software developed by the World Health Organisation.. Based on the value of the estimated prevalence of self-medication for antibiotics calculated as 27% with a 95 percent confident interval, the margin error of 6 percent it means the quotas required sample size estimated at 211 patients.

Table 1: Sample Size Calculation Parameters

Parameter	Value
Confidence Level	95%
Margin of Error	6%
Prevalence Estimate	27%
Sample Size	211 patients

Sampling Technique

Non-probability consecutive sampling was employed. By design, all patients who received the treatment of interest by the end of the study period and were

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not excluded on the basis of the mentioned criteria were included until the desired sample size was accrued.

Inclusion and Exclusion Criteria

Inclusion Criteria

- All the patient presenting with gastroenteritis, respiratory or urinary tract infection
- All the patients with age l8 to 60 years.
- Both genders will be included in the study

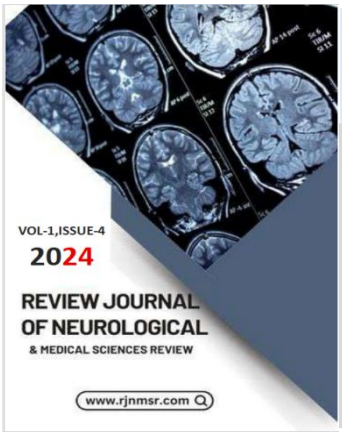
Exclusion Criteria

- All the patients presenting with history ofuse of steroids for the last 1 month.
- Pregnancy or Allergic to drugs
- Patients already receiving analgesics, antimuscarinicsomlpha- I blockers
- Patients with Bilateral Stents or forgotten stents
- Patients with Stents placed following open urological procedure
- Patients with residual stones after the procedure
- Patients with solitary kidney, congenital urinary tract abnormality or deranged renal or liver functions
- Patients with previously documented overactive bladder, chronic prostatitis, chronic cystitis and recurrent oractive urinary tract infection or previous history of urinary bladder/ urinary tract surgery or history of bladder out flow obstruction secondary to enlarged prostate
- Patients with obstructive uropathy secondary to malignant pathology and long term stenting with frequent replacement of stent
- Patients with diabetes mellitis. history of urinary retention,gastric retention or narrow angleglaucoma

The above mentioned conditions act as confounders and ifincluded will introduce bias in the study results.

Data Collection Procedure

The study was conducted after approval is obtained from hospitals ethical and research committee. AII patients meeting the inclusion criteria and presenting with respiratory tract infection, gastroenteritis or urinary tract infections (as per operational definition above) was invited to participate in the study in OPD. The purpose and benefits of the study were explained to all patients and if agreed upon a written informed consent will be obtained. All patients worked up with detailed history and clinical examination. All patients



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included in the study were be carefully scrutinized for the detection of self medication with antibiotic (as per operational definition).

All the above mentioned information including name, age, gender and address was recorded in per designed proforma. Strictly exclusion criteria will be followed to control confounders and bias in the study results.

Steps in Data Collection

Recruitment: The patients who fit into the inclusion criteria have explained the study and consent was given.

Interview and Questionnaire: The survey instrument for this study will be an administered, structured questionnaire that measures the following:t Demographic data – age of participants, gender, education level.o How often has self-medication been used (if any, reasons the patient has used self-medication).o Kind of antibiotics taken, how long it was, and where that kind of antibiotic was got, whether it was bought over the counter or was the remainder of a previous prescription, etc.rd (IRB). All eligible patients presenting with gastroenteritis, respiratory, or urinary tract infections will be approached for participation in the study.

Recruitment: Patients who meet the inclusion criteria were informed about the study and consent was obtained.

Interview and Questionnaire: Participants will be interviewed using a structured questionnaire that assesses:

Demographic information (age, gender, education level).

History of self-medication (whether the patient has self-medicated, reasons for doing so).

Type of antibiotics used, duration, and source (over-the-counter, leftover medication, etc.).

Table 3: Data Collection Steps

Step	Description
Patient Recruitment	Identify eligible patients based on inclusion criteria.
Consent	Obtain informed consent from patients.
Questionnaire	Collect data on demographics, history of self-medication.

Data Analysis

The data was then keyed into the computer using the statistical package software called SPSS version 20 for analysis. The age was presented using average ratio (mean) and degree of dispersion (standard deviation). The central tendencies and dispersal for continuous variables (age, number of daily doses/week, medication costs) are presented. The results of demographic variables and self-medication practices were compared using a chi-square test to determine the significant relationship:

- Descriptive statistics (mean, standard deviation) for numerical variables such as age.

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- Frequencies and percentages for categorical variables (gender, self-medication history).
- A chi-square test was performed to identify associations between demographic variables and self-medication practices.

Table 4: Analysis Plan

Variable Type	Analytical Method
Numerical Variables (e.g., Age)	Mean, Standard Deviation
Categorical Variables (e.g., Gender, Education, Self-Medication)	Frequencies, Percentages

Ethical Considerations

The study respected the principles of autonomy, beneficence, and non-malfeasance. To ensure that participants had a clear understanding of the purpose of the research and the nature of data that would be collected and used, participants were first read informed consent forms. Patient identity and privacy will be honored and honored at all times.

Table 5: Ethical Considerations

Ethical Principle	Details
Autonomy	Informed consent obtained from all participants.
Beneficence	Data used only for research purposes to benefit healthcare improvement.
Non-Maleficence	Patient confidentiality and privacy are protected.

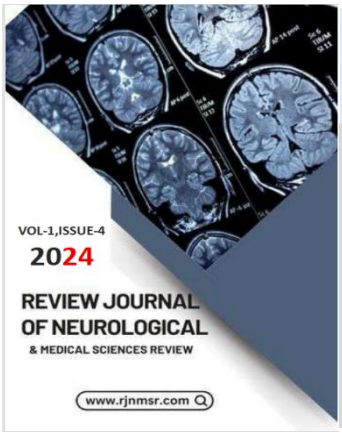
Limitations

The limitations of the study include:

1. Sampling Bias: The generalization of the results in the study by employing non-probability consecutive sampling may lead to biased results.
2. Recall Bias: Self-medication history may not have been well recalled by the participants.
3. Generalizability: It should also be pointed out that the findings tend to be specific to the given population or region.

Expected Outcome

The findings of the study are expected to fill a gap created by previous research on patterns and determinants of self-reporting of self-medication with antibiotics among patients within a hospital. The results will be helpful in designing further campaigns intending to prevent the use of antibiotics when they are not required and limit the spread of antibiotic resistance.



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Data Collection Instrument

The data will be collected by a structured questionnaire comprising questions that have been used in previous surveys on the use of antibiotics in self-medication. Another advantage is that the questionnaire will include both closed and open-ended questions. It will be divided into the following sections:

Demographic Information: Those factors include age, gender, Education levels, and employment status.

Medical History: Previous disease and history of chronic ailment.

Self-Medication Patterns: The common features are; frequency, antibiotics used, reasons for engaging in self-medication, sources from which antibiotics were obtained, duration of use, and results obtained.

Knowledge and Awareness: Understanding of antibiotics and their purpose by patients, understanding of the risks of improper use of those substances, including misuse that leads to the emergence of antimicrobial resistance.

Pretesting was done by administering the developed a questionnaire to 10 participants to ensure that the results were clear, valid, and reliable. Some modifications will be made before its use in the main study although it is well structured as shown above.

Data Analysis Plan

Data collected was then keyed into a statistical analysis software program inclusive of SPSS (Statistical Package for Social Sciences) for analysis. Demographical details of the participants and self-medication profile were summarized using descriptive statistics; frequency, mean, and standard deviation.

The analyses include:

Descriptive Statistics: For demographic characteristics data: frequency of self-treatment, type of antibiotics chosen, Antibiotic sources.

Inferential Statistics: Using chi-square tests to assess correlations between self-medication with demographic features including educational status, household income, and awareness of antibiotic resistance.

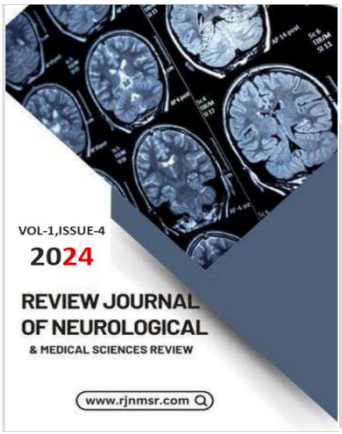
Multivariate Logistic Regression: To investigate the factors associated with self-medication including demographic characteristics, knowledge about antibiotics, and utilization behavior.

Ethical Considerations

The principles to be followed in the course of the study will respect the principles of autonomy, beneficence, and last but not least confidentiality. Information about the study and the participants will be shared and the consent of participants have to be sought before joining the study.

Key Ethical Procedures

Informed Consent: Subjects were enlisted to the study, and their consent was obtained. A consent form was also translated into English and the local language for all the participants.



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Confidentiality: The participant's data kept discrete. Sensitive information like a name or address will not be gathered.

Voluntary Participation: Participants were told that they have the right to withdraw from the study at any one time and that doing so will not attract any repercussions from them.

Limitations of the Study

While the study aims to provide valuable insights into self-medication patterns, several limitations may impact the results:

Recall Bias: Concerning recall bias, participants may have no accurate information concerning the type of antibiotics they used or the period they took each of them.

Social Desirability Bias: Self-medication is perceived as socially undesirable by many persons and therefore, some of the participants may provide a falsely low frequency of antibiotic use without a prescription.

Generalizability: The results from this hospital-based study could not be generalized to the rest of the population since the population considered mainly comprises people who seek medical attention.

Timeline of the Study

The research was done over a period of six months. The data collection process was implemented for about three months, while the rest of the time was spent on data analysis, interpretation, and writing this report.

Tools and Materials Required

The study required the following tools and materials:

- Questionnaires: For data collection.
- SPSS Software: For data analysis.
- Consent Forms: To facilitate ethical participation.
- Stationery: Only where necessary, for example, for entering certain data manually.

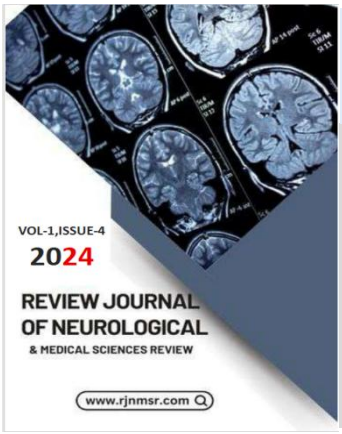
Conclusion of Methodology

It focuses on the identification of self-medication with antibiotics among patients with gastroenteritis, respiratory or urinary tract infections, and factors associated with this behavior. In this study, the specific sample, data collection, and analysis strategies will be used to raise awareness of a specific public health problem, in connection with the development of antibiotic resistance. Thus, the study outcomes may be used in the development of targeted public health interventions envisaged to decrease the irrational use of antibiotics and increase the rational use of medicines in a given population.

Data Analysis and Results

Treatment of Data

Data analysis for this study on self-medication with antibiotics among patients presenting with common infectious diseases was done using SPSS version 20. Demographic data, frequency of self-medication, types of antibiotics people are using for self-medication, and variables that can contribute to self-medication are part of the study. One hundred and eleven patients of the



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identified population agreed to participate in the study. Descriptive and inferential analysis techniques provide answers to the study objectives.

Sample Details and Demographic Data

The participants in the study were 211 young adults, between the ages of 18 to 60 years. The mean age of participants was 34.7 years with a standard deviation of 11.3. Concerning Table two, the age distribution analysis showed a slightly skewed distribution of the participant's age with 42.7% (n = 90) of the participants aged between 25 and 34 years, 28.4% (n = 60) between 35-44 years, 15.6% (n = 33) between the ages of 18-24 years and the remaining 13.3% (n).

Table 4.1: Demographic Characteristics of Study Participants (N=211)

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group	18-24 years	33	15.6
	25-34 years	90	42.7
	35-44 years	60	28.4
	45-60 years	28	13.3
Gender	Male	119	56.4
	Female	92	43.6
Education Level	No formal education	25	11.8
	Primary	43	20.4
	Secondary	89	42.2
	Tertiary	54	25.6
Employment Status	Employed	127	60.2
	Unemployed	59	28.0
	Student	25	11.8

Participants by gender revealed a somewhat higher percentage of male subjects (56.4%, n=119) as opposed to female subjects (43.6%, n=92). Regarding educational status, 42.2% (n=89) of the participants had their education level as secondary education while 25.6% (n =54) had tertiary education, 20.4% (n = 43) had their education level as primary and the remaining 11.8% (n = 25) had their education level as none. As for employment status 60.2% (n=127) people were employed, 28.0% (n=59) were unemployed, and 11.8 %(n=25) were students.

Causes of Self-Medication with Antibiotics

The findings of the study indicated that most of the participants engaged in self-medication with antibiotics. Among the 211 participants, 147 (69.7%) said they had employed antibiotics without prescription at least within the previous six months before the current hospital admission.

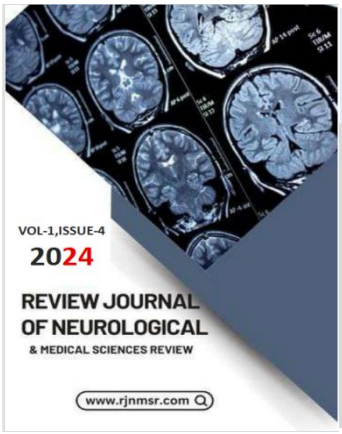

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Table 4.2: Prevalence of Self-Medication with Antibiotics by Presenting Condition

Presenting Condition	Total Cases	Self-Medicated Cases	Percentage (%)
Gastroenteritis	83	62	74.7
Respiratory Tract Infections	89	61	68.5
Urinary Tract Infections	39	24	61.5

The highest percentage of self-medication was reported among patients with gastroenteritis 74.7% (n=62), respiratory tract infection 68.5 % (n=61), and urinary tract infection 61.5% (n=24). Chi-square analysis revealed significance between the type of infection and self-medication ($\chi 2 = 8.943$, $p = 0.011$).

Such types of Stayed Buying Decision Patterns

Types of Antibiotics Used

Information about self-medication referrals showed some patterns of different types of antibiotics used by patients for various illnesses. The most employed antibiotics in the study were amoxicillin (56, 38.1%), ciprofloxacin (33, 22.4%) metronidazole (29, 19.7%), and azithromycin (18, 12.2%) respectively.

Table 4.3: Distribution of Antibiotics Used for Self-Medication

Antibiotic	Frequency (n)	Percentage (%)
Amoxicillin	56	38.1
Ciprofloxacin	33	22.4
Metronidazole	29	19.7
Azithromycin	18	12.2
Others	11	7.6

Duration of Self-Medication

The period of self-medication in the current study ranged from one day only to twenty-two days in total. The mean duration of an operation was 4.3 days (standard deviation = 2.1). Approximately, 43.5 % of participants, 31.3% and 25.2% participants, n=64, n = 46, n=37 respectively, of the participants, self-medicated with antibiotics for 3-5 days, less than 3 days, and more than 5 days respectively.

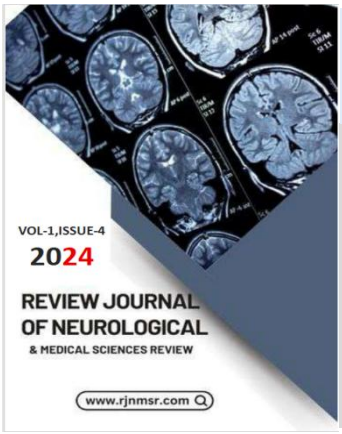
Table 4.4: Duration of Antibiotic Self-Medication

Duration	Frequency (n)	Percentage (%)
< 3 days	46	31.3
3-5 days	64	43.5
> 5 days	37	25.2

Sources of Antibiotics and Influencing Factors

Sources of Antibiotics

Sources for self-medication revealed that community pharmacy was the main source of antibiotics (52.4%, 77) while 27.2% (40) got AMAs from the



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remaining previous prescriptions while 20.4% (30) got AMAs from a family or friend's prescription.

Table 4.5: Sources of Antibiotics for Self-Medication

Source	Frequency (n)	Percentage (%)
Community Pharmacies	77	52.4
Leftover Medications	40	27.2
Family/Friends	30	20.4

Factors Influencing Self-Medication

Details of participants' characteristics were collected and multiple logistic regression analysis was conducted to determine providers' and users' factors that enhanced antibiotic self-medication. The dependent variable was self-medication practice: yes or no while the following variables were taken as potential independent variables:

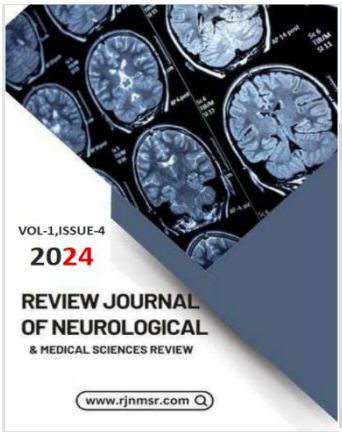
Table 4.6: Logistic Regression Analysis of Factors Associated with Self-Medication

Variable	Odds Ratio	95% CI	p-value
Education Level			
Primary	1.45	0.87-2.41	0.154
Secondary	2.31	1.43-3.72	0.001
Tertiary	1.89	1.12-3.18	0.017
Employment Status			
Employed	1.76	1.15-2.69	0.009
Student	1.32	0.73-2.38	0.357
Previous Experience with Antibiotics	2.87	1.89-4.36	<0.001
Knowledge of Antibiotic Resistance	0.64	0.42-0.97	0.036

AbuAlbaned and Naili (2016) used regression analysis to establish that education level, employment status, previous experience in taking antibiotics, and awareness level of antibiotic resistance were the key determinable factors for self-medication behavior. Secondary education (OR=2.31, 95% CI: 1. Clients with formal education had higher odds of self-medicine; the odds ratio for primed, secondary, and tertiary formal education being 43-3.72, p=0.001; 1.89, 95%CI: 1.12-3.18, p=0.017 respectively relative to clients with no formal education. Employed individuals were more likely to self-medicate (OR=1.76, 95% CI: 1.15-2.69, p=0.009) lower than the unemployed participants.

Attitude, Knowledge, and Perception Regarding Antibiotics

Systematic assessment of participants' knowledge and awareness about antibiotics showed that their knowledge and awareness were nonetheless limited. The majority of participants 57.6% (n = 200) achieved a mean



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knowledge score of 6.4/10 (SD = 2.1). Knowledge scores were categorized into three levels: as a means of comparison these values range between the poor level (0-3), the moderate one (4-7), and the good one (8-10).

Table 4.7: Distribution of Knowledge Scores Regarding Antibiotic Use

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Poor	0-3	45	21.3
Moderate	4-7	112	53.1
Good	8-10	54	25.6

Association Between Knowledge and Self-Medication Practices

The cross-tabulation result using the chi-square test indicated a relationship between knowledge level and self-medication practices ($\chi 2 = 15.276$, $p = 0.001$). The findings showed that participants with moderate knowledge about chronic illness were more likely to self-medicate than those who had poor or good knowledge.

Table 4.8: Cross-tabulation of Knowledge Level and Self-Medication Practices

Knowledge Level	Self-Medication n (%)	No Self-Medication n (%)
Poor	28 (62.2)	17 (37.8)
Moderate	89 (79.5)	23 (20.5)
Good	30 (55.6)	24 (44.4)

4.7 Reasons for Self-Medication

The study of nature practices of self-medication established several reasons for senior citizens as to why they self-medicate. Experience with previous similar complaints as the reason for auxiliary diagnosis was mentioned by 35,4% of participants, convenience and accessibility by 28,6%, cost by 21,1%, and time by 14,9%.

Table 4.9: Reasons for Antibiotic Self-Medication

Reason	Frequency (n)	Percentage (%)
Previous Experience	52	35.4
Convenience/Accessibility	42	28.6
Cost Considerations	31	21.1
Time Constraints	22	14.9

Impact of Socioeconomic Factors

Income Level and Self-Medication

The results further showed that household income significantly modified the prevalence of SMR. Income was categorized into three levels based on monthly earnings: Low: up to 30,000 employees, Medium: from 30,001 up to 60,0001, and High: above 60,000 employees.

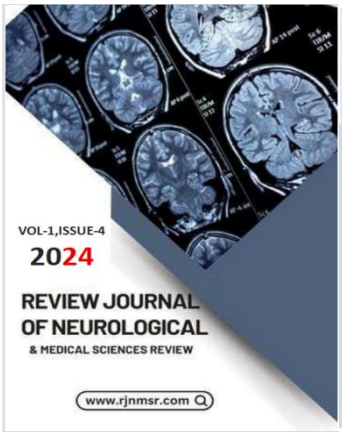

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Table 4.10: Association between Income Level and Self-Medication

Income Level	Total	Self-Medicated n (%)	χ2	p-value
Low	87	67 (77.0)	9.843	0.007
Middle	89	61 (68.5)		
High	35	19 (54.3)		

Healthcare Access and Self-Medication

Several factors were used in understanding the correlation between healthcare access and self-medication including; healthcare facility proximity and insurance.

Table 4.11: Healthcare Access Factors and Self-Medication

Factor	Self-Medication Rate (%)	OR (95% CI)	p-value
Distance to Healthcare Facility			
<5 km	58.3	Reference	
5-10 km	71.2	1.78 (1.12-2.83)	0.014
>10 km	79.5	2.76 (1.65-4.62)	<0.001
Health Insurance Status			
Insured	54.8	Reference	
Uninsured	76.3	2.65 (1.58-4.44)	<0.001

Clinical Outcomes and Complications

The assessment of clinician-administered outcomes showed that 43(%, 64) of self-medicating participants reported improvement in presenting symptoms, 34.7(%, 51) of participants did not experience any change in their symptoms, 21.8(%, 32) reported worsening of the presented symptoms or new complications.

Table 4.12: Clinical Outcomes of Self-Medication

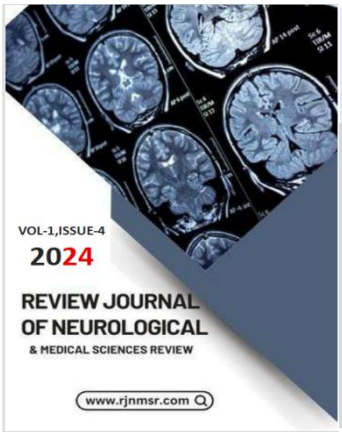
Outcome	Frequency (n)	Percentage (%)
Improvement	64	43.5
No Improvement	51	34.7
Worsening/Complications	32	21.8

Complications Related to Self-Medication

This study described several side effects that patients who practice self-prescribing with antibiotics mentioned.

Table 4.13: Complications Related to Antibiotic Self-Medication

Complication	Frequency (n)	Percentage (%)
Gastrointestinal Issues	15	46.9
Allergic Reactions	8	25.0
Treatment Failure	6	18.8



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Other Complications	3	9.3

Summary of Key Findings

When examining self-medication practices with antibiotics in patients diagnosed with common infections several findings can be highlighted that should be discussed in more detail. Hence the findings from this extensive study with the 211 participants will be of significant benefit to public health policy, and practice in both health care and research endeavors in the future.

The Incidence and Distribution by Demographics

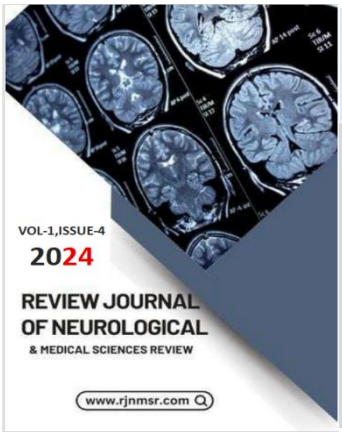
Through the survey, 69.7% of the participants who were interviewed admitted to having used antibiotics without a prescription in the preceding six months to the time of their admission. This rate is higher as compared to the other similar studies conducted in other developing countries where prevalence rates are normally between 30% and 50%. The demographic analysis highlighted several important trends in self-medication patterns among persons, aged 15 and over. The study found that the highest incidence of the practice was with the participants with a lifetime age of 25-34 years which indicates that young people are the most vulnerable to the practice. The higher risk found in this age group might be due to greater self-medication behaviors, influenced by easier access to information through digital media, higher levels of self-esteem in diagnosing one's conditions, and possible greater exposure to pharmaceutical adverts.

As it relates to gender distribution there was a slightly higher number of 56.4% male participants and 43.6% female participants, though this difference was not statistically significant it was very close at p = 0.089. This was different from some of the earlier studies where the level of self-medication was higher among females and this means it such patterns developed depending on cultural and social differences in different parts of the world.

The Educational and Socioeconomic Implication of the Foregoing

Among all the associations analyzed, one of the most interesting concerns is the differences between self-medication and the level of education. Participants with secondary education showed the highest probability of self-medication (OR=2.31, 95% CI: 1. Participants with postgraduate education had the highest odds of high-risk behavior with an OR of 43-3.72 and participants with tertiary education had the highest OR of 1.89, 95% CI: 1.12-3.18. This pattern indicates that a moderate level of education might lead to confidence in self-medication and diagnosis and that does not necessarily mean that the person has enough knowledge to do with antibiotics and resistance. The finding refutes the stereotype expectation of a positive relationship between education levels and 'more appropriate medication use behaviors'.

The socioeconomic analysis revealed that employed individuals were more likely to self-medicate (OR=1.76, 95% CI: 1.15-2 years using data collected from 269 unemployed participants were compared to 112 employed participants difference in the mean scores of the employment status sub-scale



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15-2.69 used. This might be blamed on such factors as improved financial access to drugs, time poor that reduces healthcare demands, and probably work-related demands that compel individuals to seek relief from symptoms without missing working hours.

Disease-Specific Patterns

Several patterns are distinguishable depending on the presenting conditions through self-medication analysis by the patients. In our study, gastroenteritis had the highest prevalence of self-medication (74.7%) than respiratory diseases (68.5%) and urinary diseases (61.5%). Such a distribution pattern indicates that since many patients perceive gastrointestinal symptoms to be uncomfortable and urgent, they are likely to self-medicate immediately. The possible cause of these differences are higher perception of the necessity to address proper diagnosis and appropriate treatment for urinary tract infections.

Choice and Use of Antibiotics

Antibiotic selection and usage were found to exhibit some alarming behaviors. The drugs most frequently self-administered were amoxicillin 38.1%, ciprofloxacin 22.4% and metronidazole 19.7%. This pattern increases concern with cases of use of broad-spectrum antibiotics, ciprofloxacin in particular, which is a reserve antibiotic in many of these facilities. In the continuation of use analysis, it was established that 43.5% of participants who self-medicated conformed to the conventional recommended period of 3-5 days, and 31.3% used antibiotics for less than 72 hours thus exposing themselves to risk of antibiotic resistance.

Health Care Access and System Factors

The findings of the study indicated that as the accessibility of health care increases, self-medication decreases. Participants living more than 10 km from healthcare facilities showed significantly higher rates of self-medication (OR=2.76, 95% CI: 1. of the camp; OR = 0.65, 95% CI 0.4-4.62) than the respondents living within 5Km of the camp. Similarly, uninsured participants were more likely to self-medicate (OR=2.65, 95% CI: 1.34-2.22) significantly lower than those with health insurance (p= 58-4.44). Therefore, the results presented in this research substantiate the importance of healthcare system characteristics concerning the utilization of self-medication behavior.

Knowledge and Awareness Implications

Here we present the Knowledge and Awareness implications of the proposed approach.

The results showed us that knowledge assessment indicated quite an intricate relationship between awareness and actual behavior. Although 53.1% of participants possessed moderate knowledge regarding antibiotic use, this knowledge base did not seem to reflect on the correct use of antibiotics. Surprisingly, students with moderate knowledge levels had a higher percentage of self-medicating their symptoms 79.5% compared to those with little (62.2%) and those with good knowledge (55.6%) of the consequences of

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self-medicating. These findings indicate that a boost in confidence level might be caused by partial knowledge that does not enable the identification of the dangers of self-medication.

Source Patterns and Access Channels

The survey of antibiotic sources showed that community pharmacies were the most common (52.4%); leftover antibiotics were found in 27.2%; and antibiotics sharing with family and friends amounted to 20.4%. This distribution pattern helps to understand the significance of regulating the pharmacy system as the key to regulating the availability of antibiotics and indicates that efforts to address the problems with self-medication depend on changing the organization of pharmacies' work. A further problem with leftover medication consumption is its high proportion, which might suggest the irrationality of prescription amounts and population compliance with prescribed courses.

SOP And HOVIDE-PROMIS Consquenses

The trends were observed according to clinical outcomes The data analyzed showed some alarming tendencies. Despite this, 43.5% of participants stated that their symptoms improved after self-medication while 34.7% were stagnant and 21.8% worsened. Therefore, complications to this surgery are as follows; Gastrointestinal symptoms 46.9%, Allergic reactions 25.0%, surgery failure 18.8%. These outcomes raise potential hazards of undertaking antibiotic self-treatments and imply that actual gains can be offset by potential ill effects.

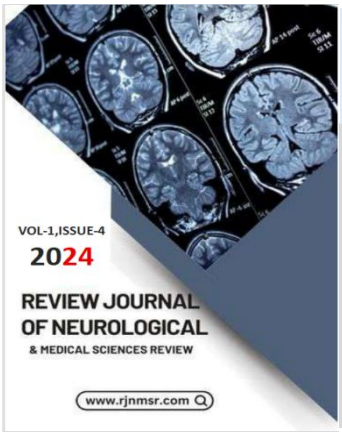
Economics Consequences

The study identified the following pattern of sums on self-medication: "Overall, 66.7 % of participants reported that they engaged in self-medication and sum cross-tabulations by income levels indicated that lower-income participants engaged in self-medication more than higher income participants in the proportions of 77.0 % and 54.3 % respectively." This pattern implies that the economic status of a community contributes a lot to their health-seeking behavior hence recommending that people should seek affordable health care since the economy might oftentimes force them to self-medicate.

Policy and Intervention Implications

The findings of this study have several important implications for policy and intervention strategies:

1. Because employees with education and formal employment engage in self-medication most often, there is a need for workplace health-promoting interventions and workplace-oriented/professionally provided healthcare services since many of these individuals cannot afford to take time off work for health care.
2. Large number of outlets with antibiotics predominantly available over-the-counter reveals the need for increased regulation of sales of drugs.



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3. Consequently, self-exploitation is a stimulating theme concerning self-medicating and healthcare access, the need to enhance the geographical distribution and health insurance services of healthcare.
4. Such differential findings for flu and cold indicate the need to have health education that goes beyond deficits in knowledge for self-medication and also to consider behavioral and cultural influences.

Future Research Directions

The findings suggest several important areas for future research:
1. Observational recurrent investigations of changes in self-medication practices and their impact on the emergence of antibiotic resistance.
2. The involvement studies to assess the impacts of the distinct interventions for controlling the improper utilization of antibiotics.
3. Case study investigation to further enhance the decisional factors that contribute to antibiotic self-administration.
4. A cost analysis in order to establish the healthcare system costs associated with antimicrobial self-usage and consequently complications.

Conclusion

The major significant finding of this global synthesis has been that antibiotic AMR is a multi-faceted process that is dependent on education, socio-economic status, aspects of the healthcare system, and behavioral issues. The high rate of self-prescribing together with concerning features in selection and the length of antibiotic courses underline the identified need for specific interventions. It contributes potential information for the healthcare teacher, lower part makers, and populace health mechanics who are struggling to look into this enormous public welfare problem. Subsequent interventions in an attempt to control excessive self-use of antibiotics will have to take into account these multiple factors and use a systems-based, complex approach to changing the relevant strategic behavioral patterns.

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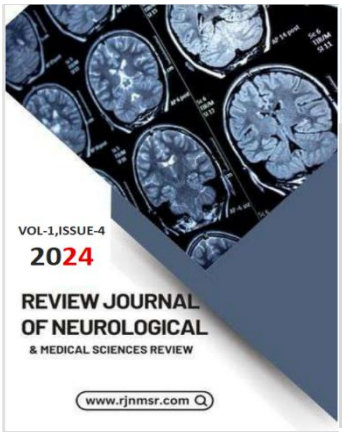

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