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Prevalence and Determinants of Antibiotic Self-Medication among Algeria Population: A Cross-Sectional Study

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Abstract
Background: *Antibiotic self-medication constitutes a major public health challenge due to its substantial contribution to the emergence and dissemination of antimicrobial resistance (AMR). In Algeria, despite regulatory frameworks restricting antibiotic dispensation without prescription, the prevalence of this practice continues to rise, reflecting gaps in enforcement and public awareness.*
Objective: *The present study aims to investigate the prevalence, sociodemographic and behavioral determinants, and usage patterns associated with antibiotic self-medication within the general population of Algiers.*
Methodology: *A descriptive cross-sectional survey was conducted from April to June 2021 among 80 randomly selected individuals from four municipalities of Algiers. Data were collected using a structured questionnaire assessing sociodemographic characteristics, knowledge, attitudes, and practices regarding antibiotic use. Statistical analyses were descriptive.*
Results: *Among respondents, 63.7% reported self-medicating with antibiotics at least once during the previous 12 months. The main reasons for self-medication were previous medical experience (42.5%) and perceived mildness of symptoms (28.7%). Pharmacies were the main source of antibiotics without prescription (74%), followed by family and friends (15%). Amoxicillin and Amoxicillin–clavulanic acid were the most used antibiotics. Only 37% of respondents were aware of antibiotic resistance, and 52% did not complete their antibiotic courses.*
Conclusion: *The study reveals a high prevalence of antibiotic self-medication in Algeria, largely due to weak regulatory enforcement and unrestricted access to antibiotics. Strengthened antibiotic stewardship and targeted public awareness programs are urgently required to curb antimicrobial resistance.*
Keywords: *Self-medication, Antibiotics, Antimicrobial resistance, public health, Algeria.*

Introduction

Antibiotics represent one of the greatest medical advances of the twentieth century, significantly reducing illness and death caused by bacterial infections[1]. However, their extensive misuse and overuse have led to the rapid emergence of antimicrobial resistance (AMR), now recognized as a major global health threat[2,3]. Among the different forms of inappropriate antibiotic use, self-medication with antibiotics (SMA) the consumption of antibiotics without a medical prescription remains particularly widespread in low- and middle-income countries[4,5].

This practice is driven by multiple factors, including socioeconomic limitations, difficulties accessing healthcare, previous positive experiences with antibiotics, and the misconception that these drugs are effective against viral infections[6–8]. The global prevalence of SMA ranges from 20% in high-income countries to more than 70% in developing regions, with estimates of 50–80% across the Middle East and North Africa[9–11]. Self-medication not only increases the risk of adverse drug reactions and therapeutic failure but also accelerates the spread of resistant bacterial strains[12].

The World Health Organization repeatedly warns that antibiotic self-medication is a key driver of AMR, threatening to usher in a post-antibiotic era in which common infections may once again become fatal[13]. In Algeria, despite regulations limiting antibiotic sales to prescription-only, uncontrolled access remains common[14]. A national survey conducted by the Union Nationale des Opérateurs de la Pharmacie (UNOP) in 2017 reported that more than half of Algerians practiced self-medication, with antibiotics among the most frequently used drugs [15]. Moreover, global data rank Algeria among the world's highest antibiotic consumers[16].

These observations highlight persistent gaps in antibiotic stewardship, pharmacy regulation, and public awareness. Pharmacies often serve as the primary source of non-prescribed antibiotics, reflecting both public demand and professional non-compliance[17]. Understanding the social and behavioral determinants of this practice is therefore essential to develop effective public health strategies. Assessing community knowledge, attitudes, and behaviors toward antibiotic use is crucial for informing national policies and awareness campaigns. Identifying local drivers of SMA can help shape interventions that promote rational antibiotic use, preserve drug efficacy, and mitigate the growing threat of antimicrobial resistance.

This study aims to assess the prevalence and determinants of antibiotic self-medication among the general population in Algiers, Algeria. Specifically, it evaluates the frequency of non-prescribed antibiotic use, explores the sociodemographic and behavioral factors associated with this practice, and identifies the most commonly used antibiotics and the conditions for which they are taken. The study also examines public knowledge and awareness regarding appropriate antibiotic use and antimicrobial resistance, providing evidence to support future interventions promoting prudent antibiotic practices.

Material and Methods

Study Design and Setting

A descriptive cross-sectional study was conducted from April 15 to June 15, 2021 from Algeria. The study aimed to evaluate self-medication practices with antibiotics among the general population. Algiers, the capital city, represents a densely populated urban area with wide socioeconomic diversity, providing an appropriate setting to assess public behaviors regarding antibiotic use.

Study Population and Sampling

The study enrolled 80 participants aged 18 years and older, selected through a stratified random sampling method to ensure proportional representation across age groups, gender, and educational levels. Individuals employed in the healthcare sector were excluded to minimize potential bias. Participation was voluntary, and written informed consent was obtained from all respondents.

Data Collection Tool

Data were obtained using a structured, self-administered questionnaire developed in French and validated by a panel of academic experts. The

instrument comprised four sections: (1) sociodemographic characteristics, (2) knowledge of antibiotics and their clinical indications, (3) attitudes and practices regarding antibiotic use and self-medication, and (4) awareness of antibiotic resistance and potential adverse effects. A pilot study involving 10 participants was conducted to evaluate clarity, comprehension, and reliability prior to final deployment.

Data Statistical Analysis

All collected data were entered and analyzed using Microsoft Excel and SPSS version 25. Categorical variables were summarized using frequencies and percentages, while continuous variables were expressed as means ± standard deviations. Associations between self-medication practices and sociodemographic factors were assessed using the chi-square test, with statistical significance set at $p < 0.05$.

Ethical Considerations

The study adhered to principles of confidentiality and anonymity. Ethical approval was obtained from the Faculty of Medicine, University of Algiers 1. Participation was voluntary, and respondents retained the right to withdraw at any time without providing justification.

Results

Sociodemographic Characteristics of Participants

A total of 80 individuals from the general population participated in the survey, comprising 54 women (67.5%) and 26 men (32.5%). The majority of participants were aged 20–40 years (58.7%), followed by 41–60 years (25%) and over 60 years (16.3%). Regarding educational attainment, 46.2% had completed university studies, 33.8% had secondary education, and 20% had only primary education. In terms of occupational status, 37.5% were employed, 28.7% were students, 18.8% were unemployed, and 15% were homemakers. Only 12.5% reported affiliation with the healthcare sector.

Knowledge and Awareness about Antibiotics

Most participants (82.5%) reported previous antibiotic use. However, misconceptions were common, with 44% believing that antibiotics are effective against viral infections such as colds and influenza. Amoxicillin (64%) and amoxicillin–clavulanic acid (22.5%) were the most frequently cited antibiotics. Only 37% of respondents were aware of the concept of antibiotic resistance, and 45% reported never having received information on its associated risks.

Prevalence and Patterns of Self-Medication

Self-medication with antibiotics was reported by 63.7% of participants in the 12 months preceding the study. The main reasons cited included prior successful medical experience (42.5%), perception of a mild illness (28.7%), and time or cost constraints (21.3%). Pharmacies were the primary source of non-prescribed antibiotics (74%), followed by leftover medications from previous treatments (19%) and advice from relatives or friends (7%).

Discussion

The findings of this study indicate a high prevalence (63.7%) of antibiotic self-medication among Algeria population. This rate is consistent with reports from other North African and Middle Eastern countries, where prevalence ranges from 56% in Egypt[10] to over 70% in Saudi Arabia[11]. Despite national regulations restricting over-the-counter antibiotic sales[14], antibiotics remain easily accessible, reflecting a persistent gap between legislation and enforcement. Such widespread misuse represents a serious public health concern, as highlighted by the World Health Organization[2,13].

The predominance of amoxicillin and amoxicillin–clavulanic acid among self-medicated antibiotics aligns with findings from previous Algerian and regional studies [14,18]. These antibiotics are widely available and perceived as safe and effective, which contributes to their frequent use without medical supervision. Similar patterns have been reported in Morocco and Tunisia [18,19], where penicillins and macrolides are the most commonly self-prescribed drugs. This trend reflects a broader global issue: the misuse of broad-spectrum antibiotics for self-limiting illnesses, often of viral origin [6,8,20].

In this study, the main reasons for self-medication included previous successful antibiotic experiences,

perceived mildness of illness, and time or cost barriers to consulting physicians. These determinants are consistent with findings from other low- and middle-income countries (LMICs) [4,10,21]. Limited access to healthcare and affordability remain strong drivers of self-medication[4], while self-diagnosis based on prior experience continues to influence behavior even among individuals aware of potential risks [6,8].

Pharmacies were the primary source of non-prescribed antibiotics (74%), a pattern reported in multiple countries including Sudan, Jordan, and Lebanon[22–24]. Pharmacists often dispense antibiotics without prescriptions due to patient demand or insufficient regulatory oversight, despite acknowledging their contribution to antimicrobial resistance (AMR)[7,17]. Strengthening pharmacists' role through stewardship training and legal accountability could substantially reduce inappropriate dispensing.

Public knowledge and awareness of antibiotic resistance were low in this study (37%), consistent with findings from Egypt, Ethiopia, and Nigeria [10,25,26]. Both WHO and CDC emphasize that public understanding of AMR remains limited despite global awareness campaigns[2,3,13,17]. Inadequate awareness perpetuates unsafe practices such as incomplete antibiotic courses, observed in over half of the respondents, which is a recognized risk factor for resistance development[16,27]. Similar behavior has been reported in Italy and India, where patients frequently discontinue antibiotics upon symptom relief[9,28].

Adverse effects were underreported despite 34% of participants experiencing them, highlighting limited pharmacovigilance and weak patient–provider communication[29]. Implementing community education and pharmacist counseling could help mitigate these gaps.

The high prevalence of self-medication in Algeria reflects a convergence of cultural, economic, and systemic factors. Easy access to pharmacies, self-confidence in personal medical knowledge, and limited physician availability are commonly identified determinants across LMICs[4,6,23]. The WHO Global Action Plan on Antimicrobial Resistance underscores that addressing this issue requires multisectoral strategies combining regulatory enforcement, public education, and professional accountability[30]. The high prevalence of self-medication in Algeria reflects a convergence of cultural, economic, and systemic factors. Easy access to pharmacies, self-confidence in personal medical knowledge, and limited physician availability are commonly identified determinants across LMICs[31]

This study has several limitations. The sample size (80 participants) was relatively small and restricted to urban areas of Algiers, which may not reflect rural practices. Self-reported data may introduce recall and social desirability biases, and the cross-sectional design prevents causal inference between sociodemographic factors and self-medication behaviors. Nevertheless, the study provides valuable insights into community-level antibiotic use in Algeria and offers a basis for future nationwide research.

Conclusion

Self-medication with antibiotics remains highly prevalent in Algeria, primarily driven by easy access, prior personal experience, and limited awareness of antimicrobial resistance. Pharmacies constitute the main source of non-prescribed antibiotics, highlighting the need for stricter regulation and enhanced pharmacist engagement in antimicrobial stewardship. Implementing targeted public education campaigns, together with rigorous enforcement of dispensing laws, is essential to reduce inappropriate antibiotic use. Strengthening surveillance systems and promoting responsible antibiotic practices are critical measures to curb antimicrobial resistance and preserve antibiotic efficacy in the country.

Ethics approval and consent to participate

This study involved a community-based survey conducted among adults from the general population. Participation was entirely voluntary, and informed consent was obtained from all respondents after explaining the objectives and anonymity of the study.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and was approved by the Scientific Committee of the Faculty of Pharmacy, University of Algiers.

Consent for publication

All authors have approved this article for publication.

Availability of data and materials

Data are available from the corresponding author upon request.

Competing interests

All authors declare that there is no conflict

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