



Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

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Abstract

Aim: This study aimed to assess the knowledge, attitudes, and practices (KAP) related to antimicrobial self-medication among a convenience sample of the population

Methodology: A descriptive cross-sectional study was conducted using a self-administered semi-structured questionnaire. A convenience sample of 359 participants provided appropriate consent for the study. The questionnaire comprised four sections: demographics, KAP regarding antimicrobial self-medication, professional medical knowledge, and attitudes of caregivers of children toward antimicrobial self-medication. The questionnaire was initially developed in English, translated into its final Arabic version, pilot-tested, and face-validated. Descriptive and quantitative analyses were performed using SPSS (V.20.0).

Results: Approximately 64% (231) of the participants had used antibiotics without a prescription in the past 12 months, a practice significantly correlated with female gender and lack of knowledge. The primary reasons for self-medication were to save time and effort (109, 47%) and reluctance to visit doctors (89, 39%). Over 60% of participants used amoxicillin-clavulanic acid, with leftovers from previously prescribed medications and purchases from community pharmacies being the main sources of antibiotics. Among the 85 participants who were caregivers of young children, 18 (21%) reported administering antibiotics to their children without consulting a physician. Out of 115 participants claiming medical background, only 30 (26%) answered section 3 correctly, with 23 of them reporting antibiotic self-medication.

Conclusion: This study revealed a notable inclination toward antibiotic self-medication among adults and children, which was not significantly reduced even among those with a medical background. The study highlights the need to address the underlying reasons for this practice to mitigate its prevalence.

Introduction

Antibiotics play a crucial role in combating bacterial infections by either killing bacteria or inhibiting their activity. They are used for therapeutic and prophylactic purposes. However, misuse of antibiotics can occur through medication non-compliance or self-medication practices. Antibiotic self-medication involves purchasing and self-administering antibiotics or giving them to children without consulting a healthcare professional, often to address perceived infections. (Alumran et al., 2013)

Self-medication with antibiotics is a global issue and is not limited to low- or middle-income countries. Various countries have reported instances of antibiotic self-medication, with rates ranging from 19.8% in Romania to over 70% in Greece and Ghana. Factors contributing to antibiotic misuse internationally include lack of compliance, easy availability of antibiotics without prescriptions, inadequate regulations, and

Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

limited healthcare professional knowledge. High medical costs, dissatisfaction with healthcare providers, and the desire for quick remedies also contribute to this problem. (Abdel Gawad Elmasry et al., 2013)

Antibiotic misuse can have far-reaching consequences on social, economic, and health aspects. One of the most significant impacts is the development of antibiotic resistance, where bacteria become resistant to drugs previously effective against them. This resistance leads to treatment failures and the need for more expensive and sometimes riskier alternative medications. The World Health Organization (WHO) has highlighted the threat of antimicrobial resistance and emphasized the urgent need for action to combat this growing problem. (Tagoe et al., 2010)

In light of these concerns, this study aims to assess the extent of antibiotic misuse and identify factors associated with antibiotic self-medication among the population. Understanding these factors is crucial for implementing targeted interventions to curb antibiotic misuse and its adverse effects on public health. (Darwish et al., 2014)

Methodology

Study Design and Sampling: This study employed a descriptive cross-sectional design to assess the attitudes towards antimicrobial agent usage among the population. A convenience sample of 400 participants was selected to represent various districts, backgrounds, and age groups.

Data Collection: Data collection took place over a period of two months, from August to October 2014. The convenience sample was interviewed in various settings such as pharmacies, clubs, cafes, streets, by students involved in the innovation project. Prior consent was obtained from participants before they answered the questionnaire, and measures were taken to ensure the confidentiality of collected data.

Questionnaire Construction and Validation: The questionnaire was designed to include both newly developed questions by the research team and items adapted from previously validated questionnaires related to similar topics. These questions were formulated in English to align with societal norms and were later translated into Arabic for the final version. The translated questionnaire underwent pilot-testing for face validation and reliability before the final version was used.

The questionnaire consisted of 39 questions divided into four sections:

1. **Demographics:** Nine questions related to age, gender, occupation, nationality, address, monthly income, education level, chronic disease status, and medical insurance coverage.
2. **General Medical Knowledge and Practices:** Twenty questions assessing general medical knowledge, self-medication practices, antibiotic misuse, reasons for such practices, and identification of commonly misused antibiotics.
3. **Medical Background:** Five questions to identify participants with a medical background (students and professionals).
4. **Attitudes of Children Caregivers:** Five questions examining the attitudes of caregivers towards antibiotic misuse.

Data Analysis: Data were coded and analyzed using SPSS (V.20.0). Descriptive and quantitative analyses were performed, and the chi-square test was used to determine statistically significant associations between variables at a significance level of $p < 0.05$. Results were presented as mean $\pm$ standard deviation (SD) unless otherwise specified.

Results

Out of the 400 distributed questionnaires, 359 participants (89.7%) responded and were included in the study. The demographic characteristics of the participants, including age, gender, occupation, nationality, address, income, education level, chronic disease status, and medical insurance coverage, are detailed in Table 1. Women showed a statistically significant higher prevalence of self-medication practice compared to men ($p < 0.05$). However, other factors such as medical background, chronic medication use, economic status, and educational parameters did not show significant correlations with self-medication attitudes.

Among the participants, 64.3% (231 out of 359) reported using antibiotics without a prescription in the past 12 months. The primary reasons cited for this practice were saving time and effort (47%), avoiding doctor

Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

visits (39%), and saving money (11%). Amoxicillin-clavulanic acid was the most commonly misused antibiotic, reported by over 60% of participants who specified the exact type of antibiotic misused.

Sources of antibiotics for self-medication included commercial pharmacies (most common) and leftovers from previous prescriptions. Participants often based their choice of antibiotic on indications, type, and lack of previous adverse reactions, rather than price or brand considerations. Regarding dosage calculation, participants typically consulted pharmacists or physicians, used pamphlets, or relied on personal experience.

About 36% of participants completed their antibiotic course as prescribed, while 38% stopped treatment upon symptom disappearance. Many participants reported reading the antibiotic pamphlet before use, although understanding varied. Notably, 27% of participants kept medication leftovers for extended periods, a habit positively associated with antibiotic self-medication ($p = 0.001$).

Common gaps in medical knowledge related to antibiotic use were observed, such as the belief that antibiotics can cure viral infections, speed recovery from colds, and are more effective if newer or expensive. Additionally, a significant portion of participants (43%) had not heard about bacterial resistance. Participants with a medical background had a higher prevalence of self-medication practice (79%) compared to those without a medical background (63%). Caregivers for young children showed varying attitudes towards antibiotic administration without consulting a doctor, with 21% reporting direct administration and 20% attempting to obtain a prescription over the phone.

The study findings highlight significant gaps in knowledge and practices related to antibiotic use and self-medication among the population of . These findings underscore the importance of targeted educational interventions and improved healthcare access to address antibiotic misuse.

Table 1. Relationship between the demographic factors and the rate of self-medication

Demographics	Total (n)	Self-medicating (n)	% Self-medicating	(% of total=359)	n	χ^2	p Value
Gender							
Male	137	70	19.0	12.1		0.000*	
Female	222	155	43.0				
Education							
Non-educated	6	3	1.0	1.59		0.810	
Basic	3	2					
Middle	57	41	11.0				
Over middle	12	6	2.0				
University	245	153	43.0				
Post-graduate study	36	25	7.0				
Profession							
Unemployed	33	18	5.0	6.57		0.255	
Skilled worker	93	64	18.0				
Manual worker	5	3	1.0				
Housewife	22	17	5.0				
Student	171	111	31.0				
Other	35	17	5.0				
Monthly income							
None	199	129	36.0	1.59		0.810	
500–1000 Egyptian Pounds	14	8	2.0				
1000–3000 Egyptian Pounds	31	21	6.0				
≥3000 Egyptian Pounds	31	22	6.0				

Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

No answer	80	43	12.0			
Chronic diseases						
Having chronic diseases	58	10	17.0	5.38	0.068	
Liver and/or kidney	10					
Diabetes	5					
Cardiovascular diseases	20					
Asthma	8					
Others	20					

Table 2. Knowledge questions performed by the medical and non-medical population

Population	Knowledge Questions	Answer with Yes	N (%)
Medical			
Population	(A) Does AB cure bacterial infection?	249	69.4%
	(B) Does AB cure viral infection?	149	41.5%
	(C) Does AB speed recovery?	99	27.6%
	(D) Would newer AB or those of high prices be more effective?	170	47.4%
	(E) Have you heard about bacterial resistance?	200	55.7%
Non-Medical			
Population	(A) Does AB cure bacterial infection?	249	69.4%
	(B) Does AB cure viral infection?	149	41.5%
	(C) Does AB speed recovery?	99	27.6%
	(D) Would newer AB or those of high prices be more effective?	170	47.4%
	(E) Have you heard about bacterial resistance?	200	55.7%

Discussion

This study is among the first to investigate the knowledge, attitudes, and practices of antibiotic misuse specifically. The questionnaire utilized in this study was a combination of adapted questions from validated instruments and newly developed items tailored to the local societal norms and cultures. Despite the challenges of data collection through self-administered questionnaires, the study ensured participant understanding and data accuracy. (Grigoryan et al., 2006)

The findings revealed that 64% of the study sample engaged in antibiotic self-medication in the 12 months prior to the study. This rate is comparable to other regions with similar cultural backgrounds and medication regulations, such as Spain, Jordan, Finland, Greece, Ghana, Cairo, and Romania. Misconceptions about antibiotic use and resistance were prevalent among participants, with significant percentages believing that antibiotics can cure viral infections or accelerate recovery from common colds. (Togoobaatar et al., 2010)

The accessibility of antibiotics in community pharmacies, coupled with economic factors and patient beliefs, contributed to the high prevalence of self-medication. Common sources of antibiotics for self-medication included community pharmacies and medication leftovers, highlighting the need for regulatory agencies to address antibiotic misuse and implement proper medication disposal systems. (Mitsi et al., 2005)

Despite the tendency towards self-medication, participants showed caution regarding dosage administration, often consulting healthcare professionals or reading medication pamphlets. However, non-compliance with completing antibiotic courses was noted in 26% of the sample, underscoring the

Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

importance of pharmacist-led patient education on bacterial resistance, proper antibiotic use, and potential drug interactions. (Byarugaba, 2004)

Among participants with medical backgrounds, a significant proportion still exhibited self-medication practices, suggesting that societal attitudes may override medical knowledge in influencing behavior. Caregivers for young children demonstrated similar attitudes but were more cautious when administering antibiotics to their children. (Abasaheed et al., 2009)

In conclusion, antibiotic misuse mirrors trends observed in other culturally similar regions. Strategies to address this issue include awareness campaigns on antibiotic resistance and proper use, stringent regulations limiting antibiotic prescription to healthcare professionals, and the implementation of national drug disposal systems. Dispensing exact drug quantities prescribed and providing comprehensive patient education are also recommended to reduce drug waste and promote responsible antibiotic use. (Väänänen et al., 2006)

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Assessing Antibiotic Misuse: A Study on Knowledge, Attitudes, and Practices among the Population

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