

Patterns of Antibiotic Use, Knowledge, and Perceptions among Jordanian Population: A Cross-sectional Study

Manal Ayyash^{1*}, Rana Abu-Farha², Kamel Jaber³, Suleiman Ateih², Amal Akour^{4,5}

¹Department of Pharmaceutics and Pharmaceutical Science, Faculty of Pharmacy, Applied Science Private University, Amman, Jordan.

²Department Clinical Pharmacy, Faculty of Pharmacy, Applied Science Private University, Amman, Jordan.

³School of Medicine, The University of Jordan, Amman- Jordan.

⁴Department of Pharmacology and Therapeutics, College of Medicine and Health Sciences, United Arab Emirates University, Al-Ain, UAE.

⁵Department Biopharmaceutics and Clinical Pharmacy, Faculty of Pharmacy, The University of Jordan, Amman, Jordan.

ABSTRACT

Background: Practices concerning antibiotic use have detrimental impacts on body immunity, bacterial resistance, and the overall health of the general population. Misconceptions regarding antibiotic use can lead to improper use and malpractice, posing numerous health threats.

Objectives: This study aims to assess the knowledge, practices, and awareness of Jordanian adults about antibiotics. This includes an analysis of their understanding of antibiotic uses and the sources from which they acquire such knowledge. **Methods:** A representative sample of Jordanian adults was invited to participate in an online survey distributed through social media platforms.

Key findings: The results showed that 77.6% of the participants had received an antibiotic at least once in the past 12 months. About two thirds reported no problems with using a different brand name (alternative) for the prescribed antibiotic. The majority of respondents trust the decisions made by pharmacists. Moreover, participants with higher ages, female participants, those with a higher level of education, uninsured participants, and those with a medicine-related degree showed better antibiotic knowledge compared to others ($P < 0.05$ for all).

Conclusion: There is a good level of antibiotic-related knowledge amongst Jordanian adults. However, prevalent misconceptions and improper use also exist, indicating the need for focused attention on correcting such practices that might adversely impact the health of the community as a whole.

Keywords: Awareness; perception; antibiotics; Use; Jordan.

INTRODUCTION

Antibiotics are drugs that fight infections of bacterial origin, as defined by the Food and Drug Administration (FDA) (1). They are arguably among the most successful forms of chemotherapy in the history of medicine (2) and have been found to be among the most commonly sold classes of drugs from community pharmacies in developing countries (3). Despite antibiotics being classified as

prescription-only medicines, they are often dispensed to patients without a medical prescription in various parts of the world (4). In particular, in various Middle Eastern countries, antibiotics can be easily obtained over the counter, potentially contributing to the high prevalence of self-treatment with antibiotics (2). According to legislations issued by the Jordanian Food and Drug Administration (JFDA), antibiotics should be strictly prescribed by doctors. Unfortunately, these regulations are not fully enforced (5,6). Consequently, this irrational dispensing of antibiotics could result in an increase in bacterial resistance, posing global health threats.

*Corresponding author: Manal Ayyash

m_ayyash@asu.edu.jo

Received: 13/09/2023 Accepted: 18/12/2023.

DOI: <https://doi.org/10.35516/jjps.v17i1.1808>

Even with the development of new antimicrobial agents against these resistant strains, bacteria will likely acquire resistance to these modified versions over time through the horizontal acquisition of novel resistance mechanisms (2). In Jordan, given the importance of this topic, researchers have extensively explored the area of antibiotic-related knowledge and perceptions, sometimes targeting the public and other times healthcare providers (7,8,9,10,11). A 2018 cross-sectional study evaluated the general public's knowledge of antibiotic use and bacterial resistance (10). Another study assessed parents' views on antibiotic use in their children (11). Regarding healthcare providers, some studies targeted pharmacists' knowledge and behavior regarding antibiotics (7,9), as well as the attitudes of dental practitioners (8). All of these studies found unsatisfactory levels of knowledge and perception regarding proper antibiotic use and a significant rate of self-medication with antibiotics among different study groups (7,8,9,10,11).

While numerous studies have examined antibiotic-related knowledge and perceptions over time in Jordan, this area is expected to evolve as perceptions change after numerous governmental efforts to increase awareness about this global issue. Accordingly, these changes necessitate continuous tracking, especially given the recent increase in advising and instructing patients on appropriate antibiotic use in healthcare facilities and among providers in Jordan. Thus, an in-depth, recent evaluation of the general Jordanian community was needed to assess these aspects. Our research aims to evaluate the level of knowledge and perceptions of the Jordanian population towards antibiotics, as well as their pertinent practices.

METHODS

Study design, settings, and participants

This is a descriptive, cross-sectional, survey-based study conducted between May and June 2022, to assess the public's knowledge, perceptions, and practices towards

antibiotics. In this study, a convenience sample of Jordanian individuals was invited to participate by sending a survey link through social media platforms (Facebook and WhatsApp). The inclusion criteria were adult subjects (≥ 18 years) who are residing in Jordan. Participants were informed about the aim of the study, and they were asked to provide a written consent form before completing the survey, which takes approximately ten minutes.

Sample size calculation

The sample size was calculated based on the number of subjects per predictor needed to conduct a linear regression analysis, as recommended by Tabachnick and Fidell (5-20 subjects per predictor) (12). Using 20 subjects per predictor and assuming we have six predictors, a minimum sample size of 120 was considered representative. We aimed to recruit a larger number of subjects to enhance the power of the study.

Survey development and validation

The draft questionnaire was created by study researchers to assess the public knowledge, perceptions, and practices of the Jordanian population regarding antibiotics. Then, face and content validity for the draft questionnaire were conducted by a group of experts in clinical pharmacy. These experts' comments were compiled and evaluated, leading to minor modifications in the draft questionnaire. These changes were not included in the final analysis. The finalized questionnaire consisted of five sections: the first section collected participants' demographics. The second section assessed participants' previous experiences with antibiotics. The third section contained multiple-choice questions about their practices with antibiotics. The fourth section included questions about participants' knowledge of antibiotics, and their sources of antibiotic-related information, if any. The last section aimed to understand participants' general perceptions of antibiotic usage using five-point Likert scale questions. The survey was translated and distributed in Arabic, the native language of the Jordanian people, using a forward translation and back translation approach. For the knowledge section, participants' knowledge was assessed with 12

true/false statements. For each statement, participants received one point for a correct answer, and no points for an incorrect answer. The total knowledge score of each participant was then calculated out of 12.

Ethical consideration

The Ethics Committee provided Institutional Review Board (IRB) approval at Applied Science Private University (Approval number: 2022-PHA-11). This study adhered to the World Medical Association Declaration of Helsinki guidelines (13). Participants were informed that their responses would remain anonymous, their data would be kept confidential, and that their participation was entirely voluntary.

Statistical analyses

Statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). Median/interquartile range (IQR) and frequency/percentage were employed for the descriptive analysis of continuous and qualitative variables, respectively. Independent factors that may affect participants’ knowledge about antibiotics were investigated using linear regression

analysis. Following simple linear regression, any variable with a P-value ≤ 0.25 was considered eligible for entry into multiple linear regression analysis. All variables were checked for an absence of multicollinearity before conducting the multiple linear regression analysis (i.e., Pearson correlation coefficient <0.9 for any two variables). A P-value of ≤ 0.05 was deemed statistically significant when identifying factors affecting participants’ knowledge about antibiotics.

Results

During the study period, 533 individuals were approached and invited to participate in the study. The participants had a median age of 33 years (IQR= 23.0). More than two-thirds of the survey participants were females (n= 369, 69.2%). Also, 67.4% held a university degree (n= 359). About half of the participants were married (n= 244, 45.8%), and over 62% were medically insured (n= 322, 62.3%). In addition, 34.7% held a medicine-related degree (n= 185). For more details about participants’ sociodemographic characteristics, please refer to Table 1.

Table 1. Sociodemographic characteristics of the study participants (n= 533)

Parameters	Median (IQR)	n (%)
Age (years)	33.0 (23.0)	
Gender		
• Male		164 (30.8)
• Female		369 (69.2)
Educational level		
• Not educated		39 (7.3)
• School level		63 (11.8)
• University graduate		359 (67.4)
• Post-graduate		72 (13.5)
Marital status		
• Married		244 (45.8)
• Others (Single, divorced, or widowed)		289 (54.3)
Medical insurance		
• No		201 (37.7)
• Yes		332 (62.3)
Do you have a medical-related degree?		
• No		348 (65.3)
• Yes		185 (34.7)

IQR: Interquartile range

Table 2 summarizes participants' previous history of using antibiotics. The majority of respondents reported taking antibiotics during their lifetime (n=512, 96.1%), with roughly 77.7% of them (n=414) having received antibiotics at least once during the past 12 months. Additionally, about 80% of the participants stated that

some of their family members had received antibiotics during the past 12 months. In fact, approximately three-quarters of the participants revealed that they obtain their antibiotics with prescriptions (n=393, 73.7%), but only 60.0% of them (n=320) reported that they always complete the course of antibiotics.

Table 2. Participants previous history of using antibiotics (n= 533)

Parameters	n (%)
Have you ever taken antibiotics?	
• Yes	512 (96.1)
• No	11 (2.1)
• I don't know.	10 (1.9)
How many times have you received antibiotics during the past 12 months?	
• Never	119 (22.3)
• once	191 (35.8)
• 2-5 times	166 (31.1)
• More than 5 times	57 (10.7)
Have any of your adult family members received antibiotics during the past 12 months?	
• Yes	425 (79.7)
• No	108 (20.3)
• Did you get the antibiotic on prescription?	
• Yes	393 (73.7)
• No	140 (26.3)
• When you receive antibiotics, did you always complete the course of antibiotic?	
• Yes	320 (60.0)
• No	69 (12.9)
• Sometimes	144 (27.0)

Participants were asked to describe their behaviors when dealing with antibiotics (Table 3). Results showed that approximately half of the participants visit doctors if they believe they have an infection (n= 241, 45.2%), while about one-fourth (n= 129, 24.2%) reported directly visiting a pharmacy and seeking advice and counseling from the pharmacists. Other participants reported visiting a pharmacy to purchase a previously used antibiotic (n= 60, 11.3%), or asking family members or friends about their experience with an antibiotic they had used previously (n= 19, 3.6%). Only 15.8% reported staying at home without

taking antibiotics (n= 84).

Furthermore, participants were asked to report their behaviors if their doctor prescribed an antibiotic with a specific brand name. From this, 31.9% of them (n= 170) stated they would only take that exact brand name, while 59.1% (n= 315) reported that they would not mind taking the same antibiotic under a different brand name (alternative). Few participants (n= 22, 4.1%) reported that they would not mind taking any other antibiotics recommended by the pharmacist, other than the one prescribed.

Table 3. Participants practice in dealing with antibiotics (n= 533)

Parameters	n (%)
<p>If you feel sick (infection disease symptoms), how do you behave?</p> <ul style="list-style-type: none"> ● Visit your doctor and follow his instruction then purchase the prescribed antibiotic. ● Go to the pharmacy directly and ask the pharmacist for his advice and counseling. ● Go to the pharmacy and purchase your previously used antibiotic. ● Ask your family member or friend about his experience in antibiotic he used previously. ● Stay at home without taking antibiotic. 	<p>241 (45.2)</p> <p>129 (24.2)</p> <p>60 (11.3)</p> <p>19 (3.6)</p> <p>84 (15.8)</p>
<p>If your doctor prescribed an antibiotic with a specific brand name, which of the following describes you best?</p> <ul style="list-style-type: none"> ● I believe to take only the same brand name. ● I do not mind taking the same antibiotic (API) with different brand name (alternative) ● I don't mind taking any other antibiotics recommended by pharmacist other than the prescribed one. ● I don't believe in taking any antibiotic. ● Others 	<p>170 (31.9)</p> <p>315 (59.1)</p> <p>22 (4.1)</p> <p>21 (3.9)</p> <p>5 (0.9)</p>

All participants responded to 12 statements aimed at evaluating their knowledge of antibiotics (Table 4). The results showed that participants demonstrated an overall satisfactory level of knowledge about antibiotics, with an average knowledge score of 9. Approximately 80% of the participants (n= 427) understood that antibiotics can treat bacterial infections, while approximately half of them (n= 292, 54.8%) mistakenly believed that antibiotics can also treat viral infections.

Nearly three-quarters recognized that frequent usage of antibiotics can lead to the emergence of resistant bacterial strains. However, the majority of participants believed

they could use leftover antibiotics in the future (n= 375, 70.4%), and an even larger percentage (n= 451, 84.6%) believed one could stop taking the medication once they feel better.

Furthermore, 82.2% of the participants (n= 438) reported believing that receiving antibiotics several times would diminish their body's immunity, and a similar percentage (n= 460, 86.4%) believed antibiotics could predispose them to an allergic reaction. Additionally, approximately 70.4% (n=375) reported using antibiotics for bone and body pain.

Table 4. Participants' knowledge about antibiotics (n= 533)

Statements	Correct answers n (%)
Antibiotics are medicines that can treat bacterial infections ^a	427 (80.1)
Antibiotics can be used to treat viral infections ^b	292 (54.8)
Antibiotics are used always in flu and cold symptoms ^b	330 (61.9)
Antibiotics can cure all infections ^b	362 (67.9)
Antibiotics are used to relieve body pain and bone pain ^b	375 (70.4)
Antibiotics kill the transient (bad) bacteria that cause the infection, and it has no effect on normal flora ^b	262 (49.2)
Receiving antibiotics several times will reduce the body immunity ^a	438 (82.2)
Leftover antibiotics can be saved for future use ^b	375 (70.4)
If one feels better after only partially completing an antibiotic course, one can terminate the therapy immediately ^b	451 (84.6)
Antibiotics can cause allergic reaction for some people ^a	460 (86.4)
Frequent usage of antibiotics leads to development of resistant strains of bacteria ^a	407 (76.4)
Suspension dosage form of antibiotic should be stored at refrigerator temp (3-8C) after reconstitution ^a	318 (59.7)
Knowledge score (out of 12.0): median (IQR)	9.0 (5.0)

IQR: Interquartile range. a: True statement. b: False statement

Concerning the sources of information about antibiotics (Figure 1), the main sources reportedly used by the study participants were healthcare providers (physicians and pharmacists) (n= 336, 63.0%), medical websites (n= 182, 34.1%), and academic societies (n= 456,

26.6%). The least commonly selected sources were social media (n= 81, 15.2%), and television (n= 40, 7.5%). Surprisingly, 4.7% of the participants (n= 25) reported that they were not interested in knowing anything about antibiotics.

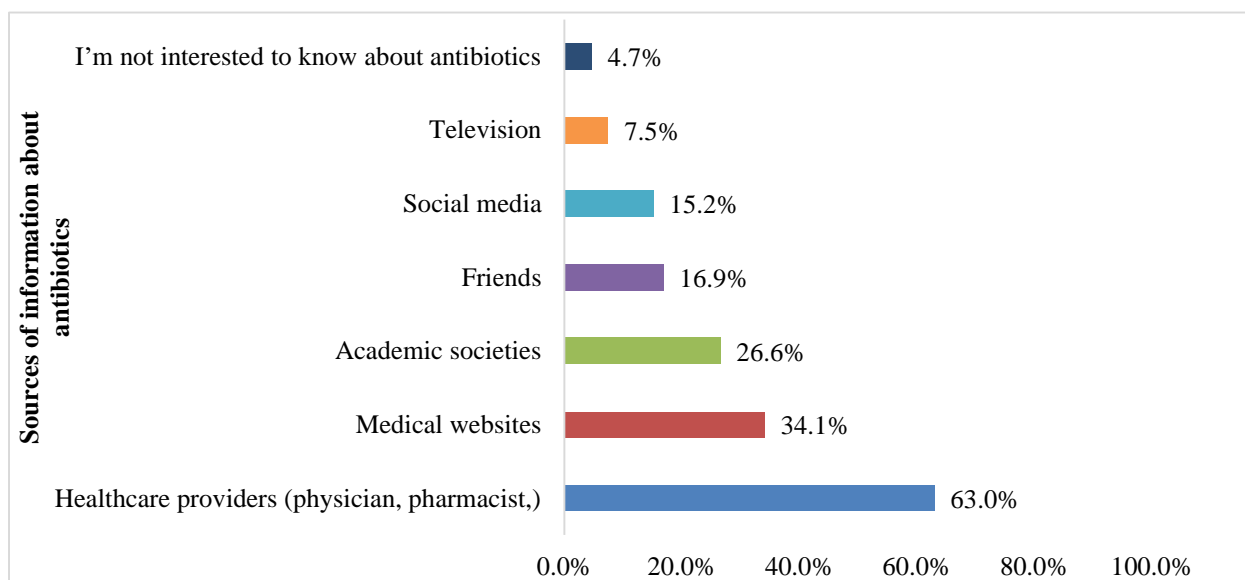


Figure 1. Sources of information about antibiotics as reported by the study participants (n= 533)

Participants were asked about their perceptions of antibiotics (Table 5). The results showed that there is significant trust in the decisions made by physicians and pharmacists in Jordan regarding the prescription and dispensation of antibiotics to patients. However, only 36.4% of the participants (n=194) believed that there are fully activated laws to control the dispensing of these medications.

A high percentage of participants (n= 456, 85.6%) believed that there is a lack of antibiotic awareness in Jordan, and the majority (n=485, 91.0%) support the integration of antibiotic awareness at the school level. Furthermore, only a minority of participants (n= 112, 21%)

agreed or strongly agreed that social media was a trusted source of information about antibiotics.

Around 68% of respondents (n= 362) believed that a prescription is needed to obtain an antibiotic from pharmacies. Additionally, about three-quarters (n= 395, 74.1%) disagreed with the concept of purchasing antibiotics online.

The majority of participants (n= 365, 68.5%) noted that pharmacists take their time to counsel them and provide information on how to use antibiotics, and 55% (n= 293) agreed or strongly agreed that pharmacists emphasize that bacterial resistance is a consequence of antibiotic misuse.

Table 5. Participants' perceptions towards antibiotics (n= 533)

Statements	Participant' responses n (%)		
	Strongly agree/agree	Neutral	Strongly disagree/disagree
I think I need a prescription to get an antibiotic from pharmacy in Jordan	362 (67.9)	76 (14.3)	95 (17.8)
Antibiotics should be allowed to purchase via online without prescription	65 (12.2)	73 (15.6)	395 (74.1)
I think there are laws in Jordan to control the dispensing of antibiotics and are fully activated	194 (36.4)	150 (28.1)	189 (35.6)
People should only take antibiotics if recommended by doctors or pharmacist	475 (89.1)	41 (7.7)	17 (3.2)
Pharmacists take their time to inform me on how antibiotics should be used when prescribed	365 (68.5)	107 (20.1)	61 (21.4)
Pharmacist informs the patient how the misuse of antibiotics may lead to development bacterial resistance	293 (55.0)	117 (22.0)	123 (23.0)
There is a lack of antibiotic awareness among the Jordanian population	456 (85.6)	48 (9.0)	29 (5.4)
Spreading awareness of antibiotics should be integrated within the elementary and secondary education	485 (91.0)	32 (6.0)	16 (3.0)
Social media is a trusted source to get information about antibiotics	112 (21.0)	140 (26.3)	281 (52.7)
I am confident in a doctor's/pharmacist's decision if she/he does not recommend antibiotics.	459 (86.1)	56 (10.5)	18 (3.4)

Finally, a linear regression analysis (Table 6) revealed that participants with greater age, female participants, those with higher education, non-insured participants, and

those with a degree related to the medical field demonstrated a better understanding of antibiotics compared to others ($P < 0.05$).

Table 6. Assessment of factors associated with participants' knowledge about antibiotics.

Parameter	Knowledge score			
	Beta	P-value ^a	Beta	P-value ^b
Age (years)	0.076	0.081 ^c	0.148	0.003 ^d
Gender <ul style="list-style-type: none"> • Male • Female 	Reference 0.171	<0.001 ^c	0.129	0.001 ^d
Educational level <ul style="list-style-type: none"> • Diploma or below • University graduate or above 	Reference 0.179	<0.001 ^c	0.142	<0.001 ^d
Marital status <ul style="list-style-type: none"> • Married • Others (Single, divorced, or widowed) 	Reference -0.052	0.229 ^c	-0.047	0.345
Medical insurance <ul style="list-style-type: none"> • No • Yes 	Reference -0.102	0.018 ^c	-0.115	0.003 ^d
Do you have medical-related degree? <ul style="list-style-type: none"> • No • Yes 	Reference 0.421	<0.001 ^c	0.393	<0.001 ^d

a: using simple linear regression, b: using multiple linear regression, c: eligible for entry in multiple linear regression, d: significant at 0.05 significance level.

DISCUSSION

The awareness about antibiotic use is still lacking among the Jordanian population (14,15,16), as in several countries around the world (17,18). Despite efforts to illustrate how antibiotics should be handled and the detrimental consequences of self-medication with antibiotics on bacterial resistance (19,20) and reduction of body immunity (20) by impacting the normal flora, people continue to self-diagnose and self-prescribe these medications, as well as misuse them (5,6,14).

Our study aimed to gather data showcasing the knowledge and perceptions regarding antibiotic usage among the Jordanian population. It examined misconceptions about when and how these medications

should be used, practices of self-prescription, and trust in the decisions made by healthcare workers concerning the need to dispense such drugs. This evaluation of the Jordanian community follows many literature sources identifying the deficit in antibiotic knowledge and recommending the institution of campaigns and workshops to raise awareness about these agents (5,6,14).

Our results showed an acceptable level of knowledge about antibiotics. For example, 80% of the participants believe that antibiotics are used to treat bacterial infections, versus 60% as reported by a previous study in Jordan in 2020, that only included parents (thus only married participants), and fewer participants with medically related degrees compared to our study. This may

partially explain the difference in knowledge (5). However, the lack of knowledge was still apparent in some areas. For instance, about two-thirds of respondents agreed that antibiotics are useful when they have flu or cold symptoms, a slightly higher percentage than reported by other studies around the world (21,22). We found that around 78% of participants have received antibiotics at least once in the past 12 months, which is about twice the high percentage among other nations, such as Polish adults (38%) within the same period (23).

Furthermore, the study showed that 55% of participants are informed by pharmacists that antibiotic resistance can develop due to misuse of these drugs. In contrast, a Cypriot study found pharmacists were more actively involved in educating their patients (72.3%) (24). Our study also indicated that nearly three-quarters of respondents believed that leftover antibiotics can be saved for future infections, similar to findings in a recent study done in Palestine (25). This can be an alarming finding, as access to antibiotics without prescription and the use of leftover antibiotics are major contributors to bacterial resistance (26,27).

As part of further assessing participants' understanding of antibiotic indications, and the impact of their inappropriate use on both immunity and resistance, we found that 67.9% (n=362) of the participants believe antibiotics can cure all infections. Also, 70.4% (n=375) consider using them for bone and body pain, a finding that is also common among university students in Jordan [28]. Additionally, we found that around half of the respondents believe antibiotics only impact or kill harmful bacteria that cause disease, with no effect on normal microflora. These results indicate significant misconceptions that are widely accepted by the population.

The trust in decisions made by physicians and pharmacists regarding the need for antibiotics (86.1%), along with them being the main source for antibiotics-related knowledge (63%), indicates that healthcare teams are highly regarded and referenced for medical inquiries.

In contrast, social media, which serves as a source of knowledge for only 15.2% of the participants. Focusing on the role of the pharmacist as a healthcare provider in community pharmacies, the responses of the participants confirm that pharmacists play an essential role not only in advising them on the proper administration of the medication, but also in warning them that misuse of the drug -- whether by stopping it before completing the course, using leftovers, or other practices -- may reduce the efficacy of these agents in future uses due to resistance.

Based on the common practice of prescribing and selling antibiotics in Jordan, trade (brand) names rather than generic names are most often used. In this context, around a third of the respondents stated that they would only take the same brand name, while around 60% reported that they would not mind taking the same antibiotic but with a different brand name (alternative) recommended by a pharmacist.

A significant portion of the participants believes there is a lack of awareness about antibiotics among the Jordanian population (85.6%), and they also advocate for the integration of such knowledge early on in school education (91%). In addition, our study found that those participants with higher levels of education (university graduates and above), medically insured participants, and those who hold a medical-related degree demonstrated significantly higher knowledge scores compared to others.

CONCLUSION

Overall, there was an acceptable level of knowledge about the correct ways to use antibiotics. Given the causative relationship between bacterial resistance and the improper handling of antibiotic medications, such as stopping the medication early in the course and using leftovers, major changes need to occur within the Jordanian community. These efforts should rely on the trust people have in healthcare professionals who play a significant role in guiding patients towards proper practices. However, this effort must go hand in hand with enforcing the current laws

regarding antibiotic dispensing and administration by health authorities such as the Jordan Food and Drug Administration (JFDA) and the Ministry of Health.

Funding acknowledgment

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of interest

The Authors declare that there is no conflict of interest.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

REFERENCES

1. FDA. Food and drug administration: Antibiotics and antibiotic resistance. Learn when to use antibiotics to prevent antibiotic resistance. 2019.
2. Aminov R. I. A brief history of the antibiotic era: lessons learned and challenges for the future. *Frontiers in microbiology*. 2010; 1:134.
3. Cagri Buke A., Ermertcan S., Hosgor-Limoncu M., Ciceklioglu M., Eren S. Rational antibiotic use and academic staff. *International Journal of Antimicrobial Agents*. 2003; 21(1):63-6.
4. Llor C., Cots J. M. Dispensing of antibiotics without a medical prescription and communication skills of pharmacists. *J Atención Primaria*. 2013; 45(9):496.
5. Mukattash T. L., Alkhatatbeh M. J., Andrawos S., Jarab A. S., AbuFarha R. K., Nusair M. B. Parental self-medication of antibiotics for children in Jordan. *Journal of Pharmaceutical Health Services Research*. 2020; 11(1):75-80.
6. Wazaify M., Abood E., Tahaine L., Albsoul-Younes A. Jordanian community pharmacists' experience regarding prescription and nonprescription drug abuse and misuse in Jordan—An update. *Journal of Substance Use*. 2017; 22(5):463-8.
7. Al-Taani G. M., Al-Azzam S., Karasneh R. A., Sadeq A. S., Mazrouei N. A., Bond S. E., et al. Pharmacists' Knowledge, Attitudes, Behaviors and Information Sources on Antibiotic Use and Resistance in Jordan. 2022; 11(2):175.
8. Dar-Odeh N. S., Abu-Hammad O. A., Khraisat A. S., El Maaytah M. A., Shehabi A. An Analysis of Therapeutic, Adult Antibiotic Prescriptions Issued by Dental Practitioners in Jordan. *Chemotherapy*. 2008; 54(1):17-22.
9. Abdel-Qader D. H., Albassam A., Ismael N. S., El-Shara A. A., Shehri A., Almutairi F. S., et al. Awareness of Antibiotic Use and Resistance in Jordanian Community. *Journal of Primary Care & Community Health*. 2020; 11:2150132720961255.
10. Yusef D., Babaa A. I., Bashaiah A. Z., Al-Bawayeh H. H., Al-Rijjal K., Nedal M., et al. Knowledge, practices & attitude toward antibiotics use and bacterial resistance in Jordan: a cross-sectional study. *Infection, disease & health*. 2018; 23(1):33-40.
11. Abu Farha R., Suyagh M., Alsakran L., Alsous M., Alefishat E. Parental views of antibiotic use in children with upper respiratory tract infections in Jordan. *Tropical Journal of Pharmaceutical Research*. 2016; 15(9):2009-16.
12. Tabachnick B. G., Fidell L. S. Using Multivariate Statistics (5th Edition): Allyn & Bacon, Inc.; 2006.
13. World Medical A. World medical association declaration of helsinki: Ethical principles for medical research involving human subjects. *JAMA*. 2013; 310(20):2191-4.

14. Al-Azzam S. I., Al-Husein B. A., Alzoubi F., Masadeh M. M., Al-Horani S. Self-medication with antibiotics in Jordanian population. *International Journal of Occupational Medicine Environmental Health*. 2007; 20(4):373.
15. Alsayed A. R., El Hajji F. D., Al-Najjar M. A., Abazid H., Al-Dulaimi A. Patterns of antibiotic use, knowledge, and perceptions among different population categories: A comprehensive study based in Arabic countries. *Saudi Pharmaceutical Journal*. 2022; 30(3):317-28.
16. Shehadeh M., Suaifan G., Darwish R. M., Wazaify M., Zaru L., Alja'fari S. Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study. *Saudi Pharmaceutical Journal*. 2012; 20(2):125-33.
17. Figueiras A., Caamano F., Gestal-Otero J.J. Sociodemographic factors related to self-medication in Spain. *European Journal of Epidemiology*. 2000; 16(1):19-26.
18. Fuentes Albarrán K., Villa Zapata L. Analysis and quantification of self-medication patterns of customers in community pharmacies in southern Chile. *Pharmacy world science*. 2008; 30(6):863-8.
19. Haddadin R. N., Saleh S. A., Ayyash M. A., Collier P. J. Occupational exposure of pharmaceutical workers to drug actives and excipients and their effect on *Staphylococcus* spp. nasal carriage and antibiotic resistance. *International Journal of Occupational Environmental Health*. 2013; 19(3):207-14.
20. Zhang S., Chen D.-C. Facing a new challenge: the adverse effects of antibiotics on gut microbiota and host immunity. *Chinese Medical Journal*. 2019; 132(10):1135-8.
21. Effah C. Y., Amoah A. N., Liu H., Agboyibor C., Miao L., Wang J., et al. A population-base survey on knowledge, attitude and awareness of the general public on antibiotic use and resistance. *Antimicrobial Resistance Infection Control*. 2020; 9(1):1-9.
22. Kong L. S., Islahudin F., Muthupalaniappen L., Chong W. W. Knowledge and expectations on antibiotic use among older adults in Malaysia: A cross-sectional survey. *Geriatrics*. 2019; 4(4):61.
23. Mazińska B., Strużycka I., Hryniewicz W. Surveys of public knowledge and attitudes with regard to antibiotics in Poland: Did the European Antibiotic Awareness Day campaigns change attitudes? *PloS one*. 2017; 12(2):e0172146.
24. Michaelidou M., Karageorgos S. A., Tsioutis C. Antibiotic use and antibiotic resistance: Public awareness survey in the Republic of Cyprus. *Antibiotics*. 2020; 9(11):759.
25. Hejaz HA. Knowledge and Attitudes towards Antibiotic Usage. *Jordan j. pharm. sci*. 2023; 16(2):447. DOI: <https://doi.org/10.35516/jjps.v16i2.1486>
26. Machowska A., Stålsby Lundborg C. Drivers of irrational use of antibiotics in Europe. *International Journal of Environmental Research and Public Health*. 2019; 16(1):27.
27. Antwi A. N., Stewart A., Crosbie M. Fighting antibiotic resistance: a narrative review of public knowledge, attitudes, and perceptions of antibiotics use. *Perspectives in Public Health*. 2020; 140(6):338-50.
28. Matalqah LM, Albals D, Radaideh KM, Al-Khateeb H, Thabet RH, Abu-Ismael L, Abunasser M. Knowledge, Attitudes and Practice toward Antibiotic Use among Under and Post-Graduate Students at Yarmouk University in Jordan: A Descriptive Study. *Jordan j. pharm. sci*. 2022; 15(3):378-89. DOI:<https://doi.org/10.35516/jjps.v15i3.411>

أنماط معرفة وتصورات واستخدام المضادات الحيوية في المجتمع الأردني: دراسة مقطعية

منال عياش^{1*}، رنا أبو فرحة²، كامل جبر³، سليمان عطيه²، أمل عكور^{4,5}

¹ قسم الصيدلانيات والعلوم الصيدلانية، كلية الصيدلة، جامعة العلوم التطبيقية الخاصة، عمان، الأردن.

² قسم الصيدلة الإكلينيكية، كلية الصيدلة، جامعة العلوم التطبيقية الخاصة، عمان، الأردن.

³ كلية الطب، الجامعة الأردنية، عمان، الأردن.

⁴ قسم الصيدلة والمواد، كلية الطب والعلوم الصحية، جامعة الإمارات العربية المتحدة، العين، الإمارات العربية المتحدة.

⁵ قسم الصيدلة الحيوية والصيدلة الإكلينيكية، كلية الصيدلة، الجامعة الأردنية، عمان، الأردن.

ملخص

الخلفية: الممارسات المتعلقة باستخدام المضادات الحيوية لها آثار ضارة على مناعة الجسم، ومقاومة البكتيريا، والصحة العامة للسكان. تؤدي المفاهيم الخاطئة المتعلقة باستخدام المضادات الحيوية إلى سوء الاستخدام وسوء التصرف، مما يشكل تهديدات صحية عديدة.

الأهداف: تهدف هذه الدراسة إلى تقييم معرفة وممارسات ووعي البالغين الأردنيين بالمضادات الحيوية وفهمهم لاستخدامات المضادات الحيوية ومصادر المعرفة.

أسلوب البحث: تمت دعوة عينة كافية من البالغين الأردنيين لملء استطلاع عبر الإنترنت يتم توزيعه عبر منصات التواصل الاجتماعي.

النتائج الرئيسية: أظهرت النتائج أن 77.6% من المشاركين قد تلقوا مضافًا حيويًا مرة واحدة على الأقل في آخر 12 شهرًا. أفاد حوالي الثلثين أنهم لا يواجهون مشكلة في الحصول على اسم علامة تجارية مختلف (بديل) للمضاد الحيوي الموصوف. غالبية المستجيبين يتقنون في القرار الذي اتخذه الصيدالدة. أيضًا، أظهر المشاركون ذوا الأعمار الأعلى، والمشاركات الإناث، وذوو التعليم العالي، والمشاركين غير المؤمن عليهم، وذوي الدرجات الطبية ذات الصلة معرفة أفضل بالمضادات الحيوية مقارنة بالآخرين بدرجة ثقة أقل من 0.05 للجميع.

الخلاصة: يوجد مستوى جيد من المعرفة المتعلقة بالمضادات الحيوية بين البالغين الأردنيين. ومع ذلك، فإن المفاهيم الخاطئة والاستخدامات غير الصحيحة منتشرة أيضًا، ويجب تركيز الانتباه على تصحيح مثل هذه الممارسات التي تؤثر على الصحة العامة للمجتمع.

الكلمات الدالة: وعي؛ تصور؛ مضادات حيوية؛ استخدام؛ الأردن.

* المؤلف المراسل: منال عياش

m_ayyash@asu.edu.jo

تاريخ استلام البحث: 2023/3/19 وتاريخ قبوله للنشر 2023/12/18.