RISKS OF USING ANTIBIOTICS WITHOUT A PRESCRIPTION TO HUMAN HEALTH

Zeyad. M. Alsharif[1]*, Loai. T. Alharbi[2], Majed. O. Alharbi[3], Ahmad. A. Bazaid[4], Basim. S. Alsurihi[5], Mohammed. S. Alkhuzaee[6], Ali. A. Alzahrani[7], Abdulrahman. M. Almalki[8], Tariq. M. Alsubhi[9], Ehsan. S. Al-Abdulaziz[10], Basim. M. Alsubhi[11]

Abstract:
The aim of the study is to the opinions of people about their use of antibiotics without a prescription, to know their attitudes and impressions about them, and to know the level of their education about the risks of antibiotics to their health, if they are used randomly without consulting the attending physician, to know the diseases that use antibiotics. An electronic questionnaire was created through the Google Drive application, where this questionnaire was distributed to social networking groups (randomly) WhatsApp, where 650 answers were obtained from those (residents of the city of Mecca), out of a total of 750 questionnaires.

Keywords: Antibiotic, risk, prescription, Human health

[1]*Pharmacy Technician, Compliance Department, Directorate of Health Affairs, Mecca.
[2]Pharmacy inspector in the Implementation Department of the Directorate of Health Affairs in Mecca.
[3]Pharmacy Technician at health Affairs in Mecca.
[4]Pharmacy Technician Supply Department, Jeddah Health.
[5]Pharmacy Technician at health Affairs in Mecca.
[6]Pharmacy Technician in the Medical Supply Department, Health Cluster, Mecca Region.
[7]Pharmacy technician in the executive management of supply chains in the health cluster in Mecca.
[8]Pharmacy Technician in the Medical Supply Department of the Health Cluster in Mecca.
[9]Pharmacy Technician at the primary healthcare center in Al-Nuwariya.
[10]Pharmacy Technician at the primary Healthcare center in Kudi&Alhijrah.
[11]Pharmacy technician at King Faisal hospital.

***Corresponding Author: -** Zeyad. M. Alsharif
*Pharmacy Technician, Compliance Department, Directorate of Health Affairs, Mecca.

DOI: - 10.53555/ecb/2022.11.8.54

Introduction:

An antibiotic (Hinnawi ,1987) (Hayek ,2001) (Al-Mallah,2023) is a substance or compound that kills or inhibits the growth of bacteria (Davey ,2000). Antibiotics belong to a broader group of antimicrobial compounds and are used to treat infections caused by microorganisms, including bacteria, fungi, and parasites (http://www.mcgill.ca/studenthealth/information/generalhealth/antibiotics/)(WHO,2013)(Jones,1977). The term "antibiotics" was coined by the scientist Waxman in 1942, to describe any substance produced by microorganisms that counteract the growth of other microorganisms in a very dilute medium (Waksman,1947). This original definition excluded other natural substances that kill microorganisms but are not produced by microorganisms (such as gastric juice and H2O2), as well as synthetic antibacterial compounds such as sulfonamides. Many antibiotics are relatively small molecules with a molecular mass of less than 2000 Dalton units. With the advancement of medicinal chemistry sciences, antibiotics have become semi-synthetic or chemically modified from original compounds found in nature, (Nussbaum; et al ,2006) Such as beta-lactam antibiotics (which include penicillin, produced by fungi of the genus Penicillium, cephalosporins, and carbapenems). Some antibiotics are still isolated from other organisms, such as aminoglycosides, and there are other antibiotics developed through purely industrial means, such as sulfonamides and fluoroquinolones. Thus, antibiotics are classified according to their origin into natural, synthetic, and compound antibiotics. In addition to this classification, antibiotics can be classified into two broad groups according to their effect on microorganisms. They are classified into bactericidal antibiotics and bacterial growth-inhibiting antibiotics. The World Health Organization has classified antibiotic resistance as a global threat that has the potential to affect anyone, of any age, and in any country (WHO,2013). The number of global deaths attributed to antibiotic resistance was approximately 1.27 million in 2019 (Christopher; et al,2022). Antibiotics are used to treat or prevent bacterial infections. When a bacterial infection is suspected (Jones & Bartlett,2011) When a bacterial infection is suspected but the responsible pathogen has not been identified, a broad-spectrum antibiotic is approved based on signs and symptoms while laboratory results come out which may take several days (Leekha; et al, 2011). Antibiotic sales without medical prescriptions have been observed in many countries (Amid; et al,1978) (Volpato; et al,2005). This exacerbates the existing problem of inappropriate use of antibiotics that leads to an increase in treatment cost, drug adverse effects, and antibiotic resistance among bacteria (Bax; et al,1998). Antibiotic resistance is a global health problem, closely related to the volume of antibiotic consumption (Austin; et al,1999)(Goossens; et al,2005) therefore, restricting antibiotic use and marketing regulations are among many important strategies to control this problem (Butler; et al,1998)(Carbon,1998). However, most initiatives regarding antibiotic misuse are directed toward optimizing physicians' prescriptions (Gonzales; et al,1999)(Spellberg; et al,2008), while other potential sources of antibiotic misuse are neglected. It has been illegal for pharmacists in Saudi Arabia to dispense an antibiotic without a medical prescription for more than three decades (Bawazir,1992). However, a previous study from the Eastern Province of Saudi Arabia demonstrated a high rate of antibiotic sales without a prescription for presumed urinary tract infections (Al-Ghamdi,2001) due to a lack of adherence to these regulations.

2-Material and Methods:

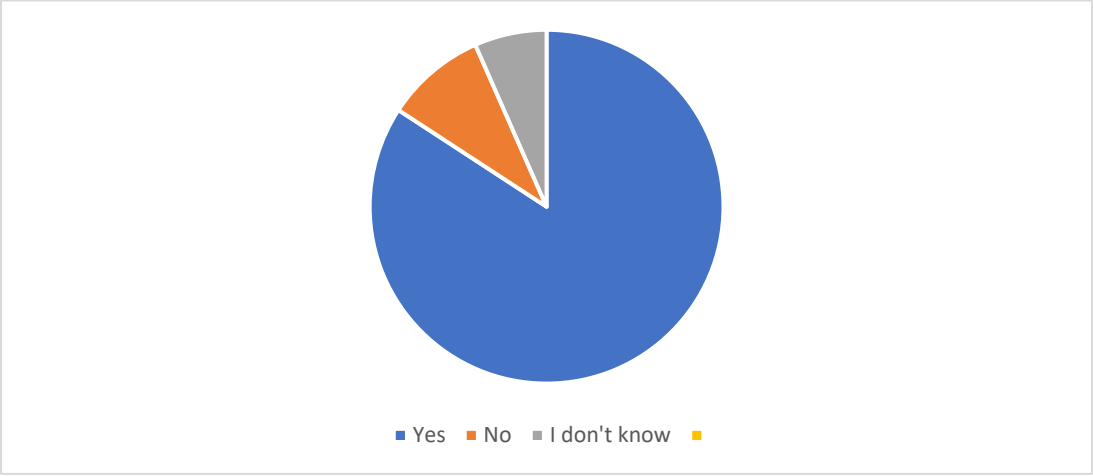
This study started in (the holy city of Mecca in Saudi Arabia), begin writing the research and then recording the questionnaire in February 2022, and the study ended with data collection in August 2022. The researcher used the descriptive analytical approach that uses a quantitative or qualitative description of the social phenomenon (Risks of using antibiotics without a prescription to human health). This kind of study is characterized by analysis, reason, objectivity, and reality, as it is concerned with individuals and societies, as it studies the variables and their effects on the health of the individual, society, and consumer, the spread of diseases and their relationship to demographic variables such as age, gender, nationality, and marital status. Status, occupation (Alserahy,2008), And use the Excel 2010 Office suite histogram to arrange the results using: Frequency tables Percentages (Al Zoghbi,2000). A questionnaire is a remarkable and helpful tool for collecting a huge amount of data, however, researchers were not able to personally interview participants on the online survey, due to social distancing regulations at the time to prevent infection between participants and researchers and vice versa (not coronavirus participation completely disappearing from society). He only answered the questionnaire electronically, because the questionnaire consisted of thirteen questions, all of which were closed. The online approach has also been used to generate

valid samples in similar studies in Saudi Arabia and elsewhere (Kadasah,2020)

3- Results:

When looking at the percentage of respondents to the questionnaire, we find that they were as follows: from 16-23 years 3.8%, from 24-31 (22.4%), and the percentage of those between the ages of 32-39 years was 22.4%, while the percentage of those between the ages of 40-47 years was 21.1%, and the percentage of those between the ages of 48-55 years was 30.3%. As for the gender of the participants, females 72%, males 28%. As for the nationalities of the participants, the majority of the participants were Saudis 95.9%, non-Saudis 4.1%, male professions students 7.5%, government employees 65%, private sector employees 7.5%, freelancers 10%, employers (not working) 10%. 0.7%, female employees in the private sector 8.5%, self-employed women 5.1%, housewives 40.7%.When moving to the responses of the participants, it was, with regard to the first question about Do you think that the use of antibiotics without a prescription represents a threat to human life? The answers for those who answered "yes" were 84.2%, 9.2% no, and 6.6% did not know. The second question is, do you think that the effects of using antibiotics without a prescription lead to higher costs of treatment and examinations? Yes 69.3%, No 14.7%, I don't know 16%. The third question was about whether there is a legal violation when dispensing antibiotics without a prescription at the medical facility (pharmacy)? Yes 77.6% answered, 10.5% no, 11.8% don't know. The fourth question is: Does the Ministry of Health carry out awareness or educational activities about the use of antibiotics without consulting the attending physician? The answers were yes 69.7%, no 19.7%, I don't know 10.5%, The fifth question: Does the excessive use of antibiotics without consulting the attending physician lead to an increase in the number of drug-resistant microbes and thus its ineffectiveness? As for the answers, yes 81.3%, no 2.7%, and I don't know 16%, the sixth question about do you take antibiotics necessary? Yes 51.3%, No 43.4%, I don't know 5.3%. The seventh question talks about do you take the antibiotics that you have based on the advice of the attending physician? And the answers are yes 92.1%, no 6.9% and I don't know 1%. The eighth question: Do you take antibiotics for viral diseases? 44% yes, 46.7% no, 9.3% don't know. The ninth question do you stop taking antibiotics completely as soon as you feel better? The answers for the participants were yes 48.7% and no 50% (close to each other), but 1.3% do not know. The tenth question: Do you consult the attending physician on how to treat the symptoms of the disease? Yes 86.8%, No 11.8%, I don't know 1.4%. The eleventh question is about whether you will continue to take antibiotics after completing the previous illness for any subsequent disease? Yes 7.9%, No 89.5%, I don't know 2.6%. The twelfth question: Does vaccination affect your health (immunity) when you take any antibiotic without a prescription? As for the answers, 45.3% said yes, 14.7% no, and 40% don't know. As for the last question, did you take the antibiotic given to another person without a prescription? The answers were yes 13.3%, no 84%, and I don't know 2.7%. (figure No.1)

Figure no.1: Participants' responses to the questionnaire regarding the use of antibiotics that they pose a threat to their lives.



4-Discussion:

Through the results of the current study, we find that the majority of the participants in the questionnaire at a rate of 84.2% find that their use of antibiotics without a prescription represents a danger to their lives because the vast majority of

both sexes (male and female government employees, with a ratio of 65% males and females 40.7%, meaning that it is considered an educated and aware percentage of the dangers of antibiotics. Also, the participants are aware of the danger of using antibiotics for any previous disease or any subsequent disease by 89.5%, and it is also the extent of awareness and awareness of a large segment of the community, it is dangerous to do this, and the majority of them, by 69.3%, are aware of the danger of using antibiotics without consulting the attending physician, and therefore they know full well that this will lead to exorbitant costs in examinations, examinations, and treatment for the sake of their health, safety, and the safety of their families greatly. Also, most of the participants support the use of antibiotics based on the consultation of the attending physician by 92.1%, and this indicates a sure indication that society is aware, educated, and educated about everything that concerns their health and the health of their families to a very large extent. And that the vast majority are fully aware of the danger of using an antibiotic given to another person, as evidenced by their answer "no" to the last question, with a rate of 84%. This study recommends increasing awareness-raising activities about the danger of using antibiotics without a prescription, whether through health facilities (health centers and hospitals), allocating appropriate time for health practitioners (doctors, nurses) and giving them material incentives to motivate them and their role in educating the community until this small, ignorant percentage (uneducated, unaware, or indifferent to the seriousness of the situation) finally disappears from society and turns completely and completely into 100% of a disease-free society. It also recommends the necessity of enacting deterrent laws for such pharmacies (by imposing financial fines, closing them permanently, and not giving them another opportunity to practice their health activities unless they are absolutely sure that they will not do so again. A study (Al-Hamoud, 2018) says that 60% of the participants do not have sufficient knowledge of antibiotics, while 92.1% of the participants in this study do not dispense antibiotics based on a prescription by the attending physician, and 69.3% of them are aware of the implications in terms of detection, examinations and treatment costs when using antibiotics without a prescription by the attending physician.

Acknowledgment:
To start with, I would like to Praise God and thank Dr. Anas S. Dablool, from Umm Al-Qura University (Public Health Department, Faculty of Health Sciences Al-leeth), Mecca, Saudi Arabia. And the researchers who make the project comes to light.

References:

1-Alserahy, Hassan Awad, et al (2008), The thinking and scientific research, Scientific Publishing Center, King Abdul-Aziz University in Jeddah, the first edition
2- Al Zoghbi, Muhammad and AlTalvah, Abas (2000), Statistical system understanding and analysis of statistical data, first edition, Jordon-Amman.
3- Al-Ghamdi M: Saudi Medical Journal. 2001, 22(12):1105-1108.
4- Alhomoud.Faten, Aljamea.Zainab and Basalelah .Lama; "Antibiotics kill things very quickly" -consumers' perspectives on non-prescribed antibiotic use in Saudi Arabia, BMC Public Health (2018) 18:1177 https://doi.org/10.1186/s12889-018-6088-z
5- Al-Hinnawi .Kamal Al-Din (1987), A Dictionary of Biology Terms: Plant Animal Classification of Heredity (in Arabic and English), Revised by: Hisham Kamal Al-Din Al-Hinnawi, Cairo: Academic Library, p. 17, OCLC: 1158873751, QID: Q118929929
6-Amidi S, Ajamee GH, Modarres Sadeghi HR, Yourshalmi P, Gharehjeh AM: Dispensing Drugs without Prescription and Treating Patients by Pharmacy Attendants in Shiraz, Iran. AJPH 1978, 68(5):495-497
7- Antimicrobial resistance: global report on surveillance (PDF). The World Health Organization. April 2014. ISBN: 978-92-4-156474-8. Archived from the original (PDF) on February 5, 2018. View it on 2016-06-13.
8- Antibiotics FAQ". McGill University, Canada. Archived from the original on June 3, 2010. Retrieved February 17, 2008.
9- Antibiotics simplified. Jones & Bartlett Publishers. 2011. p. 15–17. ISBN: 978-1-4496-1459-1. Archived from the original on 11-11-2022.
10-Austin DJ, Kristinsson KG, Anderson RM: The relationship between the volume of antimicrobial consumption in human communities and the frequency of resistance. Proc Natl Acad Sci USA 1999, 96(3):1152-6.
11- Bax RP, Anderson R, Crew J, Fletcher P, Johnson T, Kaplan E, Kanus B, Kristinsson K, Malek M, Strandberg L: Antibiotic resistance: what can we do? Nat Med 1998, 4:545-6
12- Bawazir SA: Prescribing pattern at community pharmacies in Saudi Arabia. International Pharmacy Journal 1992, 6(5):222-224

13- Butler CC, Rollnick S, Pill R, Maggs-Rapport F, Stott N: Understanding the culture of prescribing: qualitative study of general practitioners' and patients' perceptions of antibiotics for sore throats. BMJ 1998, 317:637-42

14- Carbon C, Bax RP: Regulating the use of antibiotics in the community. BMJ 1998, 317:663-5

15- Davey PG (2000). Antimicrobial chemotherapy. In Ledingham JGG, Warrell DA (editor). Concise Oxford Textbook of Medicine. Oxford: Oxford University Press. s. 1475. ISBN: 0192628704.

16- Goossens H, Ferech M, Vander Stichele R, Elseviers M: Outpatient antibiotic use in Europe and association with resistance: a cross-national databasestudy. Lancet 2005, 365(9459):579-87.

17- Gonzales R, Steiner JF, Lum A, Barrett PH Jr: Decreasing antibiotic use in ambulatory practice: impact of a multidimensional intervention on the treatment of uncomplicated acute bronchitis in adults. JAMA 1999,281(16):1512-1519.

18- Health ministers to accelerate efforts against drug-resistant TB." World Health Organization (WHO).

19- Jones RL, Peterson CM, Grady RW, Kumbaraci T, Cerami A, Graziano JH (1977). Effects of iron chelators and iron overload on Salmonella infection. Nature. c. 267 p. 5606: 63–65. DOI: 10.1038/267063a0. PMID:323727.

20-Kadasah, N.A.; Chirwa, G.C.; et al. Knowledge, Attitude, and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. Front. Public Health 2020, 8, 217.

21- Leekha S, Terrell CL, Edson RS (February 2011). General principles of antimicrobial therapy. Mayo Clinic Proceedings. c. 86 p. 2: 156–67. DOI:10.4065/mcp.2010.0639. PMC:3031442. PMID:21282489.

22- Michel Hayek (2001), Encyclopedia of Medicinal Plants (in Arabic, English, French, German, and Latin) (3rd edition), Beirut: Library of Lebanon Publishers, p. 225, OCLC: 956983042, QID: Q118724964

23- Murray, Christopher JL; Ikuta, Kevin Shunji; Sharara, Fablina; Swetschinski, Lucien; Aguilar, Gisela Robles; Gray, Authia; Han, Chieh; Bisignano, Catherine; Rao, Puja; Wool, Eve; Johnson, Sarah C. (12 Feb 2022). "Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis". The Lancet (in English). 399 (10325): 629–655. DOI:10.1016/S0140-6736(21)02724-0. ISSN: 0140-6736. PMC: 8841637. PMID:35065702.

24-Nizar Mustafa Al-Mallah, Al-Mallah's Dictionary of Entomology Terminology (in Arabic and English), Mosul: University of Mosul, p. 68, QID: Q118929029

25- S.A. Waksman (1947). What is an Antibiotic or an Antibiotic Substance? Mycologia. c. 39 p. 5: 565–569. DOI: 10.2307/3755196.

26- Spellberg B, Guidos R, Gilbert D, et al: Infectious Diseases Society of America. The epidemic of antibiotic-resistant infections: a call to action for the medical community from the Infectious Diseases Society of America. Clin Infect Dis 2008, 46(2):155-164.

27- von Nussbaum F.; et al (2006). Medicinal Chemistry of Antibacterial Natural Products – Exodus or Revival? Angew. Chem. Int. Ed. c. 45 p. 31: 5072–5129. DOI:10.1002/anie.200600350. PMID:16881035. {{Citing a peer-reviewed journal}}: Explicit use of et al. in: |author= (help) and line feed character in |title= in place 54 (help)

28- Volpato DE, Souza BV, Rosa LG, Melo LH, Daudt CA, Deboni L: Use of Antibiotics without Medical Prescription. The Brazilian Journal of Infectious Diseases 2005, 9(3):288-29