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Students' Knowledge Regarding Antibiotic Usage for Children Upper Respiratory Tract Infections

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Abstract

Upper respiratory tract infections are the most common illness that infected children under 5 years old. A healthy three-year-old toddler experiences an average of 6-10 colds each year. Most cases of Upper Respiratory Tract Infections (URTIs) are viral, less symptomatic, and self-limiting. Knowledge regarding antibiotics usage is essential especially among pharmacy and nursing students to avoid misusing bacterial resistance in the future. This research was to assess students' knowledge associated with the use of antibiotics to treat URTI that infects toddlers. A cross-sectional study was conducted on 300 students at the college of nursing and pharmacy in a private university in Baghdad, using non-probability convenience sampling. Data collection was done using a Google form. Research results show around 58.7% of the students had a good level of knowledge, whereas 41.3% of students had lack of knowledge about the usage of antibiotics in children's URTI. More than half of 60.33% of the students understood that antibiotic resistance results from overuse of antibiotics. There was a significant association between gender and knowledge of antibiotics usage (p-value=0.022).

INTRODUCTION

Antibiotics are among the most misunderstood of all drugs due to their wide availability and eminence, relatively low cost, and relatively safe quality (WHO, 2021). Meanwhile, the abuse of antibiotics use has resulted in the unstoppable spread of resistant microorganisms, resulting in a loss of efficacy of those "wonder medications." Antibiotic resistance in bacteria is a growing global issue and considered as the major causes and consequences of the global situation of antibiotic resistance. Therefore, identifying key areas to act to is urgently needed. Previous study shows that one of the most significant contributing elements to this critical problem is the rising inappropriate usage of antibiotics. The knowledge of antibiotic utilization and antibiotic resistance awareness relates to the rationale for educating the public. These conditions are thought to influence a patient's also parent's demand for antibiotic prescription (Laxminarayan, 2013; Alili-Idrizi et al., 2014; WHO 2021).

Antimicrobials were widely utilized in general care, mostly to treat Upper Respiratory Tract Infections (URTIs). Furthermore, URTIs were a major source of school absences and added to the healthcare cost. The etiology of URTIs was usually a virus and thus did not need an antibiotic prescription. Evaluating patients' misinterpretation about the usage of antibiotics for URTIs

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and nurture their awareness about the problem of antibiotic misuse, may help in reducing antibiotic misuse. The factors associated with misuse and inappropriate usage of antibiotics may differ. The knowledge and attitude are important gaps as well as people 'at risk'. Both variables' findings and strategizing targeted antibiotics would be useful in awareness campaigns and patient counselling (Chow & Liana, 2020; Roche et al. 2016; CDC, 2016).

Unnecessary and excessive antibiotic usage leads to the multiplication of resistant bacteria within the body, which can produce adverse effects that occasionally result in death, making antibiotic misuse become a disease that affects all countries across the world. The escalation of antimicrobial resistance (AMR) gives a threat described as a "silent tsunami". Drug-resistant of microorganisms has been estimated 700,000 deaths a year, a representation that could increase to 10 million deaths every year if no action is taken (WHO, 2019). The globe lost over 10 million lives after 2010 because of antibiotic abuse. Respiratory tract infections are the highest reason for antibiotics prescribing. About 90% of all antibiotic's prescriptions are issued by general practitioners. Antibiotic response knowledge differed among nations. In Malaysia, roughly 55% of respondents from the general population possessed a moderate level of understanding. 46,2 % of URTIs cases in Malaysia received antibiotic treatment, 57,7% private and 16,8% public. Other research results state that 76.7 percent of Malaysians correctly recognized antibiotics as being prescribed for the medication of bacterial disease. However, 67.2 percent of respondents wrongly believed that antibiotics were also used to cure viral disease. Furthermore, 59.1 percent of the public was cautious of the phenomenon of antibiotic resistance concerning antibiotic misuse (WHO, 2014; Llor & Bjerrum, 2014; Rahman et al., 2016).

The consumption of antibiotics increased by 36% globally since 2000 until 2010. Studies of the misuse of antibiotics give results that there is a lack of knowledge related to antibiotics among the society. For example, a study was conducted in Saudi Arabia which explored the understanding, practices, and attitudes toward medication use among health students at King Saud University. The research result concluded that pharmacy students have superior knowledge of medication application than health sciences students. All health sciences students lacked the necessary mindset and application when it came to drug safety (Alduraibi & Altowayan, 2022; Wang et al., 2019; Lalithabai et al., 2022). The current study aims to determine students' knowledge about antibiotic utilization for upper respiratory tract infections in children.

METHODS

A cross-sectional study design was conducted in 300 students from a private university in Baghdad, Iraq. The data was collected using non-probability convenience sampling from April to June 2021. A self-administered questionnaire was used to collect the data from respondents. The questionnaires consist of two parts and the first part included socio-demographics such as gender, age, college (nursing or pharmacy major), stage at college, and working status. The second part covers student knowledge about antibiotic usage to treat URTIs among children who are less than 5 years old.

Participation in the study is on a voluntary basis. Inform Consent was taken from all the respondents before answering the questionnaires. Ethical approval was taken from the ethics committee at the college of nursing of Al-Bayan University. A full explanation of the goal of the research was placed at the beginning of the questionnaires and the authors assured participants that all data will be used for scientific purposes only. Data collected was analysed using Statistical Package of Social Science (SPSS) version 24.0. In addition, a Chi-square test was used to analyse the data.

Knowledge of Antibiotics usage was measured using questionnaires adopted from Teck et al (2016) consisting of 7 questions with total score of 7. Respondents who have a score of >4 were considered as having good knowledge.

RESULT AND DISCUSSION

There were 300 total respondents, with 115 (38.3 %) males, 185 (61.7 %) females, and 73.66% unemployed as shown in Table 1. Respondents expressed that the most used antibiotic in the treatment of upper respiratory tract infection was amoxicillin (54%), followed by Erythromycin (10.6%), Augmentin (10.6 %), and Penicillin (8%).

The main results of the current study are two-thirds of students had good knowledge regarding antibiotic usage for medicating children's upper respiratory tract infections. This makes sense given the majority of the participants are nursing and pharmacy students. Most respondents assume that antibiotics cannot be given for viral diseases because they are cured automatically, and these results are good when we compare them

Table 1. Socio-demographic characteristics of the respondents

Variables	n	%
Gender		
Male	115	38.8
Female	185	61.7
College		
Nursing	146	48.7
Pharmacy	154	51.3
Grade		
1st	28	9.3
2nd	15	5
3rd	37	12.3
4th	132	44
5th	88	29.3
Employment Status		
Unemployment	221	73.66
Employment	79	26.33
What are the most common antibiotics used to treat children with upper respiratory infections		
Amoxicillin	162	54.00
Erythromycin	32	10.67
Augmentin	32	10.67
Penicillin	24	8.00
Gentamicin	12	4.00
Cephalosporins	24	8.00
Vancomycin	11	3.67
Metronidazole	3	1.00

with the results of a research conducted in Saudi Arabia, where (21.40%) of respondents think that viral infections are cured automatically. Due to a lack of awareness of the differences between viral and bacterial diseases, some respondents prefer taking antibiotics to treat all infections rather than treating the underlying cause (Alduraibi & Altowayan, 2022; Lalithabai et al., 2022; Rahman et al., 2016).

The data analysis result shown in Table 2. represents the knowledge of antibiotic use levels among respondents. The table shows that 41.3% respondents had poor knowledge and 58.7% had good knowledge regarding antibiotics for medicating upper respiratory tract infections in children.

Most respondents with a total of 227 (75.67 %) answered that they did not need to administer antibiotics to all children who have a fever. Regarding the question about whether antibiotics should be used to treat upper respiratory tract infections (colds, influenza, sore throats, ear infections), a total of 35.67% of respondents answer "No". These respondents give a "No" response on flu symptoms among children condition as they assume that they will recover faster when antibiotics are given to. The rest respondents give the response "Yes" by 55.3 % shown in Table 3.

When we asked respondents if scientists could develop new antibiotics that might kill resistant bacteria, 60.3% said yes. Meanwhile,

Table 2. The Knowledge of Antibiotic Use Level Among Respondents

Knowledge Level	N	%
Poor knowledge	124	41.3
Good knowledge	176	58.7

Table 3. The Knowledge of Antibiotics usage

Questions	n	%
Should antibiotics be given to all children who develop a fever?		
Wrong	227	75.67
Correct	37	12.33
I do not know	36	12.00
Most upper respiratory infections (such as cold, flu, sore throat, and ear infections) are of viral origin, and antibiotics should not be given to them because they can be cured automatically		
Wrong	107	35.67
Correct	164	54.67
I do not know	29	9.67
Children with flu symptoms improve faster when they are given antibiotics		
Wrong	98	32.67
Correct	166	55.33
I do not know	36	12.00
Scientists can produce new antibiotics that can kill resistant bacteria		
Wrong	25	8.33
Correct	181	60.33
I do not know	94	31.33
Antibiotics have no side effects		
Wrong	268	89.33
Correct	16	5.33
I do not know	16	5.33
Improper use of antibiotics reduces their effectiveness and pushes bacteria into resistance		
Wrong	6	2.00
Correct	276	92.00
I do not know	18	6.00
Antibiotics can be used to prevent complications from upper respiratory infections		
Wrong	21	7.00
Correct	248	82.67
I do not know	31	10.33

when we asked if there are no side effects of antibiotics, 89.3% said no and only 5.3% said yes. Regarding the incorrect use of antibiotics that might reduce their efficiency and drives bacteria to resistance, 92% of the respondents said yes. When we asked respondents if antibiotics might be used to prevent problems from upper respiratory tract infections, 82.67% said yes while only 7% said no as shown in Table 3.

Students will be familiar with antibiotics, including their use, side effects, and indications, according to highly educated respondents. Regarding students' knowledge related to the use of antibiotics, most of the students (92%) believed that the misuse of antibiotics reduces their effectiveness and encourages bacteria to develop resistance. Most respondents (82.67%) expressed that the use of antibiotics prevents complications of URTIs, and these results are close to a study conducted in Jordan in which 71.30% of its respondents believe that the use of antibiotics prevents complications of upper respiratory tract infection. Many respondents (55.33%) believe that their symptoms may improve when using antibiotics. These results are close to a study conducted in Jordan where 60.23% of its respondents believed that they may satisfy them when using antibiotics. Knowledge and beliefs also include the be-

haviour of antibiotics utilization. Both are social cognitive factors that influence health-related behaviour at an individual level. Knowledge of antibiotics user is not enough to change behaviour of antibiotics application for medicating. Knowledge does play an important role in establishing beliefs and attitudes relating a particular behaviour (Widayati, et al., 2012; Abu-Baker et al., 2012; Alsayed et al., 2022; Battah et al., 2021).

Table 4. represents the association between knowledge and socio-demographic factors. There was a significant association about gender and level of knowledge with a P-value = 0.022. There was no significant association about knowledge and other variables.

Many respondents believed that taking antibiotics reduced problems with upper respiratory infections, and many of them thought that giving antibiotics to children with flu symptoms would make them feel better sooner. Well-educated young adults on how they use antibiotics, show that misuse of antibiotics was very high. This condition happens in two regions and less developed area is the most serious. Many students have good knowledge of the use of antibiotics, and this may be due to the students' interest in this topic. Besides, most students acquire their knowledge with age and increase their standards regarding the use of antibiotics from training in hospitals or health care centres. Low knowledge of the difference of viral and bacterial infections causes this misunderstanding as doctors commonly use the term "germs". There is a misunderstanding by physicians during patient consultations, without clearly referring to a viral or bacterial disease. Therefore, some tend to often give antibiotics to treat all kinds of germs infections without recognizing the underlying cause, and antibiotics have been treated as a "wonder drug" by some to treat all kinds of symptoms (Shehadeh et al., 2012; Albayrak et al., 2021; Rahman et al., 2016; Peng et al., 2018).

CONCLUSION

In a conclusion, about two-thirds of the students have good knowledge concerning antibiotics usage for medicating children upper respiratory tract infections URTIs in children. There was a significant association between gender and knowledge regarding antibiotic usage.

REFERENCES

Abu-Baker, N.N., Gharaibeh, H.F., Al-Zoubi, H.M., Savage, C. & Gharaibeh, M.K. 2012. Mothers' Knowledge and Practices of Managing Minor Illnesses of Children Under Five Years. *J Res Nurs*, 18 (7): 651–666. https://doi.org/10.1177%2F1744987112451576

Albayrak, A., Karaka, N.M. & Karahalil, B. 2021. Evaluation of Parental Knowledge, Attitudes and Practices Regarding Antibiotic Use in Acute Upper Respiratory Tract Infections in Children Under 18 Years of Age: A Cross-Sectional Study in Turkey. *BMC Pediatr,* 21 (554): 1-10. https://doi.org/10.1186/s12887-021-03020-4

Alduraibi, R.K. & Altowayan, W.M. 2022. A Cross-Sectional Survey: Knowledge, Attitudes, and Practices of Self-Medication in Medical and Pharmacy Students. *BMC Health Serv Res*, 22 (1): 352. https://doi.org/10.1186/s12913-022-07704-0

Alsayed, A.R., El Hajji, F.D., Al-Najjar, M.A.A., Abazid, H. & Al-Dulaimi, A. 2022. Patterns of Antibiotic Use, Knowledge, and perceptions among Different Population Categories: A Comprehensive Study Based in Arabic Countries. *Saudi Pharmaceutical Journal,* 30 (3): 317-328. https://doi.org/10.1016/j.jsps.2022.01.013

Alili-Idrizi, E., Dauti, M. & Malaj, L. 2014. Validation of the Parental Knowledge and Attitude Towards Antibiotic Usage and Resistance among Children in Tetovo, the Republic of Macedonia. *Pharm Pract*, 12 (4): 467. https://doi.org/10.4321%2Fs1886-36552014000400003

Battah, M., Halboup, A., Othman, G., Mansoure, A.A., Sulaiman, S.A.S., Ali, F., Al-Khazzan, A.Y. & Ibrahim, M.I.M. 2021. Knowledge, Attitude, and Practice of Antibiotic Use and Its Resistance among Undergraduate Students at the University of Science and Technology, Sana'a, Yemen. *Journal of Hunan University Natural Sciences*, 48 (11): 34-43. http://jonuns.com/index.php/journal/article/view/844

CDC. 2016. *Centers for Disease Control and Prevention Antimicrobial Use and Resistance (AUR) Module*. January 2016. http://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf. Accessed May 22, 2016

Chow & Liana, N. 2020. Knowledge and Attitude on Antibiotic Use among Public in Rural Area Batu Pahat, Johor. *Malaysian Journal of Public Health Medicine*, 20 (1): 220-228. https://doi.org/10.37268/mjphm/vol.20/no.1/art.566

Lalithabai, D.S., Hababeh M.O., Wani, T.A.

Aboshaiqah, A.E. 2022. Knowledge, Attitude, and Beliefs of Nurses Regarding Antibiotic use and Prevention of Antibiotic Resistance. *SAGE Open Nursing,* 8: 23779608221076821. https://doi.org/10.1177/23779608221076821

Laxminarayan, R., Duse, A., Wattal, C., Wattal, C., Zaidi, A.K., Wertheim, H.F., Sumpradit, N., Vlieghe, E., Hara, G.L., Gould, I.M., et al. 2013. Antibiotic Resistance—The need for Global Solutions. *Lancet Infect Dis*, 13 (12): 1057–1098. https://doi.org/10.1016/s1473-3099(13)70318-9

Llor, C. & Bjerrum, L. 2014. Antimicrobial Resistance: Risk Associated with Antibiotic Overuse and Initiatives to Reduce the Problem. *Therapeutic Advances in Drug Safety*, 5 (6): 229–241. https://doi.org/10.1177/2042098614554919

Peng, D., Wang, X., Xu, Y., Sun, C. & Zhou, X. 2018. Antibiotic Misuse among University Students in Developed and Less Developed Regions of China: a Cross-Sectional Survey. *Glob Health Action,* 11 (1): 1496973. https://doi.org/10.1080/16549716.2018.1496973

Rahman, A.B., Teng, C.L., Sivasampu, S. 2016. Antibiotic Prescribing in Public and Private Practice: a Cross-Sectional Study in Primary Care Clinics in Malaysia. *BMC Infect Dis,* 16 (208): 2333392816643720. https://doi.org/10.1186/s12879-016-1530-2

Roche, M., Bornet, C., Monges, P., Stein, A., Gensollen, S. & Seng, P. 2016. Misuse of Antibiotics Reserved for Hospital Settings in Outpatients: a Prospective Clinical Audit in a University Hospital in Southern France. *International Journal of Antimicrobial Agents*, 48 (1): 96-100. https://doi.org/10.1016/j.ijantimicag.2016.03.015

Teck, K.C., Ghazi, H.F., bin Ahmad, M.I., binti Abdul Samad, N., Yu, K.L.E., binti Ismail, N.F. & bin Esa, M.A.A. 2016. Knowledge, Attitude, and Practice of Parents Regarding Antibiotic Usage in Treating Children's Upper Respiratory Tract Infection at Primary Health Clinic in Kuala Lumpur, Malaysia. *Health Services Research and Managerial Epidemiology*, 3. https://doi.org/10.1177/2333392816643720

Shehadeh, M., Suaifan, G., Darwish, R.M., Wazaify, M., Zaru, L. & Alja'fari, S. 2012. Knowledge, Attitudes, and Behavior Regarding Antibiotics Use and Misuse among Adults in the Community of Jordan. A Pilot Study. *Saudi Pharmaceutical Journal*, 20 (2): 125–133. https://doi.org/10.1016/j.jsps.2011.11.005

Wang, W., Wang, X. & Hu, Y.H. 2019. The Misconception of Antibiotic Equal to an Anti-Inflammatory Drug Promoting Antibiotic Misuse among Chinese University Students. *Int. J. Environ. Res. Public Health*, *16* (3): 335; https://doi.org/10.3390/ijerph16030335

Widayati, A.; Suryawati, S.; de-Crespigny, C.; Hiller, J.E. 2012. Knowledge and Beliefs about Antibiotics among People in Yogyakarta City Indonesia: A Cross-Sectional Population-Based Survey. *Antimicrob. Resist. Infect. Control*, 1 (38): 1-7. https://doi.org/10.1186%2F2047-2994-1-38

World Health Organization. 2014. Antimicrobial resistance: global report on surveillance 2014. Geneva: World Health Organization.

World Health Organization. 2019. *New Multi-Partner Trust Fund launched to combat antimicrobial resistance globally*. https://www.who.int/news/item/19-06-2019-new-multi-partner-trust-fund-launched-to-combat-antimicrobial-resistance-globally

World Health Organization. 2021. *Call to Action on Antimicrobial Resistance 2021.*