
Prevalence and Predictors of Self-Medication with Antibiotics for Children in Makkah, Saudi Arabia

Enas Hamdy Alfalogy¹, Haneen Basem Nafadi², Sara Hameed Al Rehaili², Bushra Abed AL-Harbi²

¹Department of Family Medicine, Faculty of Medicine, Suez Canal University, Ismailia, Egypt

²Medical Students at Umm Al Qura University, Makkah, KSA

Email address:

Enas_hamdy2007@yahoo.com (E. H. Alfalogy), Haneen.bn@outlook.com (H. B. Nafadi), Saraalrehaili3@gmail.com (S. H. Al Rehaili), Bushra_alharbi.md@hotmail.com (B. A. AL-Harbi)

To cite this article:

Enas Hamdy Alfalogy, Haneen Basem Nafadi, Sara Hameed Al Rehaili, Bushra Abed AL-Harbi. Prevalence and Predictors of Self-Medication with Antibiotics for Children in Makkah, Saudi Arabia. *European Journal of Preventive Medicine*. Vol. 5, No. 5, 2017 pp. 60-64. doi: 10.11648/j.ejpm.20170505.12

Received: June 16, 2017; **Accepted:** July 3, 2017; **Published:** August 3, 2017

Abstract: Self-medication with antibiotics is becoming a very common practice, and it is being practiced globally carrying a significant economic burden and health hazards. This study assesses prevalence and predictors of self-medication with antibiotic for children. A cross-sectional study was carried out on 252 mothers selected randomly from primary health care Centers in Makkah, during the period Jan - July 2016. Mothers were interviewed about giving their children antibiotic without prescription using a semi structured questionnaire. Data was analyzed using IBM advanced SPSS statistical package version 23. Logistic regression analysis was done to determine which of the factors are independently associated with self-medication with antibiotic for children. As a result, in total, 252 respondent mothers were interviewed with mean age 36.7±18.4. The prevalence of self-medication with antibiotic for children was 39.3% despite that the majority 82.9% has satisfactory knowledge about proper antibiotic use. Amoxicillin clavulenic is the most self-prescribed antibiotic representing 53.3% followed by amoxicillin 25.6%. The predictors for self-medication were educational level, income, residence and knowledge about antibiotics use. It was concluded that, Self-medication with antibiotics for children is a common practice. Policies and considerable efforts are needed to challenge the self-medication with antibiotics especially increasing the awareness among mothers about the self-medication with antibiotics risks and hazards.

Keywords: Self-Medication, Antibiotics, Prevalence, Predictors, Children

1. Introduction

Self-medication with antibiotics is an ongoing main global health problem. It is defined as the use of non-prescribed medications by people on their own initiative or on the advice of another individual, without physician consultation [1]. Antimicrobial resistance is one of the world's most persistent public health challenges. Inappropriate and prevalent use of antibiotics could lead to occurrence of antibiotic resistance and treatment failure [2].

In addition, self-medication with antibiotics has economic burden and health hazards due to patients shifting to more than one category of antibiotics as a consequence of the failure of the first line antibiotic [3].

On the other hand, numerous studies conveyed that self-

prescription might lead to delay in seeking for health care which results in inconsistent economic loss resulting from failure or delay of diagnosis of underlying illnesses and proper treatment [4, 5].

Previously, most studies reported that the frequency of self-prescription with antibiotics is relatively greater in developing countries than in developed countries [6, 7]. Regions of Eastern Europe and southern showed much higher prevalence of self-medication than western areas of Europe and northern area [7]. The prevalence has been announced to be approximately 3% in Europe [8]. Conversely, there is an enormous increase in Asia, with the values around 4-75%, which may reach 80.4% in college students [9] or even 92% in Kuwait [10].

Saudi Arabia has a worldwide significance in epidemiology of antimicrobial resistance [6, 7]. In addition,

Prevalence of self-medication with antibiotics in Saudi Arabia was about 80.6% [11]. At this time the health care system in Saudi Arabia is facing a challenge to reduce self-medication with antibiotics to decrease bacterial resistance and minimize its burden [12].

Advice from Families, the pharmacist, friends, even continuing previously prescribed medications, or recommendations from an advertisement in widespread magazines and newspapers are the most common sources of self-medications [12].

This study aims to raise awareness about the hazards of using antibiotics without medical prescription, by questioning a number of mothers and comparing the data to other results obtained from different countries.

2. Subjects and Methods

A cross-sectional study was carried out on 252 mothers who have children younger than 12 years in Makkah region selected randomly from primary health care Centers in Makkah, during the period Jan - July 2016. Sample was collected by using multistage random sample, first 5 primary health care centers were chosen from primary setting in Makkah then about 50 mothers were selected by simple random sample in each selected center. Mothers were interviewed using a semi structured questionnaire. The tool includes three main sections first section about socio demographic data (age, place of housing, education, no of children and health insurance), second section about self-medication with antibiotics for their children (type of medication, causes for giving antibiotics, source of data about giving antibiotics without medical consultation) and the third section concerning knowledge about proper use of antibiotics (indications, side effects, dose and precautions). satisfactory knowledge was set at 60%. This study was done after getting consent from all interviewed mothers. All data is solely used in the proposed research and confidentiality was assured.

3. Statistical Analysis

Data was analyzed using IBM advanced SPSS statistical package version 23. Chi-square test was used to examine the relation between qualitative variables. Logistic regression analysis was done to determine which of the factors are independently associated with self-medication with antibiotic for children. P- Value less than 0.05 was considered significant.

4. Results

In total, 252 respondent mothers were interviewed with mean age 36.7 ± 18.4 , 50.4% of them have more than two children less than 12 years, 68.8% have sufficient income and

43.3% have a family member working in the medical field and 51.6% don't have health insurance. Table 1 summarizes the socio demographic characteristics for participants and predisposing factors (age, educational level, residence, occupation, income and number of children less than 12 years).

Table 1. Socio demographic characteristics.

Socio demographic characteristics	Frequency	Percent
Age in years		
< 40	150	59.5%
≥ 40	102	40.5%
Place of housing		
Urban	233	92.5%
Rural	19	7.5%
Health insurance		
Governmental	63	25%
Private	59	23.4%
No insurance	130	51.6%
Educational level		
highly educated	203	80.6%
Not Highly educated	49	19.4%
Occupation		
Working	142	56.3%
Not working	110	43.7%
Income		
sufficient	172	68.3%
Not sufficient	80	31.7%
Number of children		
2≤	125	49.6%
2>	127	50.4%
Family member working in medical field		
Yes	109	43.3%
no	143	56.7%

Figure 1 shows that 39.3% of mothers provide their children with antibiotic without medical consultation. Mothers give their children antibiotics mainly in case of fever 23.8% and sore throat 23%.

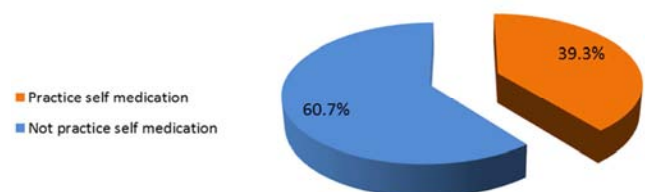


Figure 1. Prevalence of self-medication with antibiotics.

Figure 2 lists 6 different antibiotics that are commonly used by participants. Amoxicillin clavulenic is the most used self-prescribed antibiotic representing 53.3% followed by amoxicillin 25.6%, while Metronidazole was the least (2.2%).

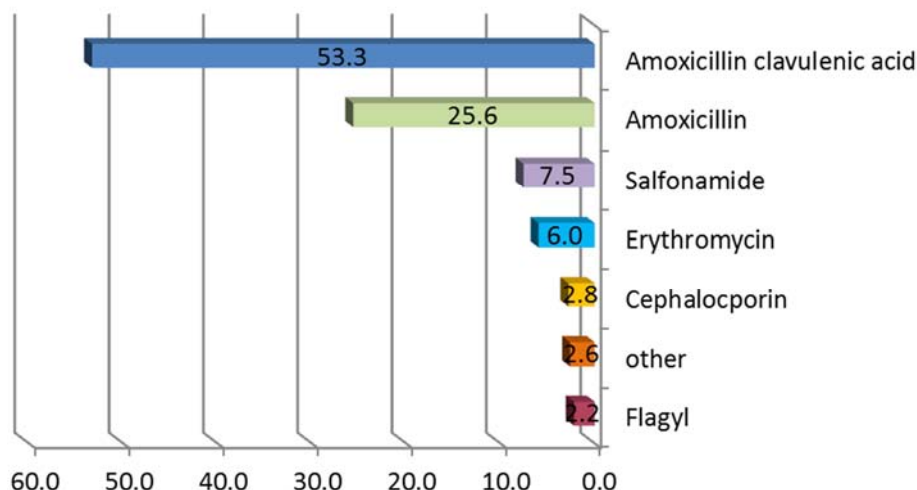


Figure 2. Most common self-medicated antibiotics.

The main sources for self-medication in the study participants are shown Figure (3). The vast majority were advised by pharmacist 50.8% followed by friends and relatives 33.7%.

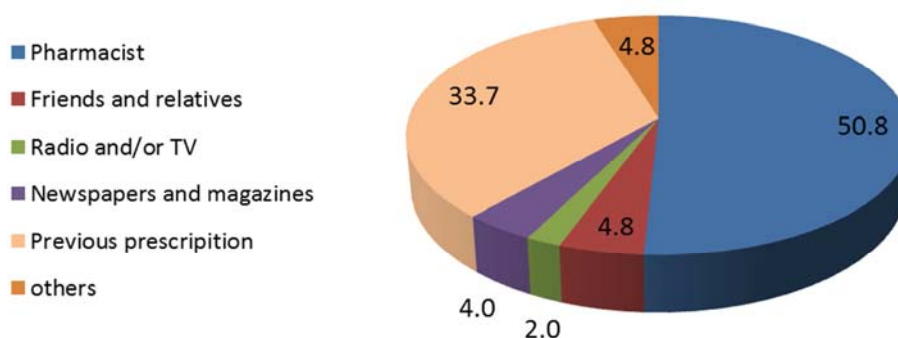


Figure 3. The main sources for self-medication.

According to scoring of respondents' knowledge of antibiotics, majority (82.9%) has satisfactory knowledge. Table 2 shows the correct statements that were discussed with mothers to estimate their knowledge about antibiotic. Approximately 70.2% of mothers correctly believe that antibiotic should not be given to all cases when body temperature rises. Additionally, 53.2% of the respondents knew that antibiotics are used for bacterial infection only. Moreover, 75% reported that inappropriate antibiotic use might lead to microbial resistance while the majority of the respondents (86.9%) correctly identified that antibiotics could cause adverse drug reactions (ADRs).

Table 2. Assessment of Knowledge about antibiotic use.

Knowledge items	Frequency	percent
Antibiotics shouldn't be given in all cases of fever		
Yes	177	70.20%
No	75	29.80%
Antibiotics used for bacterial only.		
Yes	134	53.20%
No	118	46.80%

Knowledge items	Frequency	percent
Irrational use of antibiotics leads to microbial resistance		
Yes	189	75%
No	63	25%
Viral respiratory infection doesn't need antibiotics		
Yes	157	62.30%
No	95	37.70%
Antibiotics have ADRs		
Yes	219	86.90%
No	33	13.10%
Antibiotics may vary in treating illness		
Yes	215	85.30%
No	37	14.70%
Doses are related to patient age		
Yes	234	92.90%
No	18	7.10%

The results of the binary logistic regression analysis including those variables that were significantly different between mothers who practice self-medication and mothers who do not in the univariate analysis are presented in Table 3. The predictors for self-medication were educational level, income, residence and knowledge about antibiotics use.

Table 3. Binary logistic regression analysis for self-medication with antibiotics.

	P value	OR	95% C. I	
			Lower	Upper
Educational level	0.003	0.646	0.484	0.862
Family income	0.005	0.393	0.206	0.749
Residence	0.026	5.252	1.217	22.669
Knowledge about antibiotic use	0.030	1.022	1.002	1.042

5. Discussion

Self-medication with antibiotics might increase the risk of inappropriate use and microbial resistance. In the current study, the results indicate that 39.3% of all mothers provided their children antibiotics without medical prescription. This rate is similar to Jordan study results, which shows that 40.7% of the population used antibiotics without consulting their physicians [13]. Similarly a study was conducted in USA, revealed that the prevalence of self-medication was of 43% [14] and in agreement with the prevalence of self-medication in china 35.12% [15]. On the contrary, the rate in much lower in Indonesia 7.3% [16]. While it was much higher in UAE's 56.3% [17] the result was inconsistent with the prevalence of self-medication with antibiotic in Eastern Province of Saudi Arabia (80.0%) [18] and 78.7% in Riyadh [19] and 74% in Sudan [20].

It is clear that, self-medication is much higher in developing countries as compared to developed ones which might be related to the cost of physician consultation and low level of satisfaction with general practitioners and the time constraints. On the other hand, it may be related to inefficient high disciplinary regulations. Conversely in developed countries they could afford the cost of medical consultation first and buying the prescribed medications later. Another reason that contributes to the raise of self-medication in developing countries is the existence of antibiotics as OTC medications and can be easily bought from any pharmacy.

The current study revealed that mothers were advised to use self-prescribed antibiotics mainly by pharmacist 50.8% followed by recommendations from friends and relative 33.7%. These results were in agreement to some extent with a study that shows the sources of the non-prescribed antibiotics were pharmacy 53.6% and relatives and friends 10.3% while a previous treatment 36.1% [13].

Amongst the antibiotics given to the participants' children, the most commonly used antibiotics were amoxicillin-clavulanic acid 53.3% followed by amoxicillin 25.6%. Our results were in agreement with reported results from different studies in Jordan, Sudan and Greece [13, 20, 21, 22]. On the other hand, amoxicillin was the most commonly selected antibiotic for self-medication [16, 19, 23, 24].

In the present study, fever 23.8% and sore throat 23% were the most common reasons for which self-medication with antibiotics were used. This finding matches the common reasons highlighted for self-medication with antibiotics in earlier studies [13, 19, 20]. However, the common reason was influenza 44.2% in study conducted in UAE's [17].

In the current study, the predictors for self-medication

were educational level, income, residence and knowledge about antibiotics which is in agreement with some other studies that revealed age and income are known to be predictors for self-medication [25, 26, 27].

6. Conclusion

Self-medication with antibiotics for children is a common practice. Policies and considerable efforts are needed to challenge the self-medication with antibiotics especially increasing the awareness among mothers about the self-medication with antibiotics risks and hazards.

Recommendations

1. Health education program should be available for the public about self-medication hazards and complications
2. Policy makers should prevent antibiotics to be available as over the counter drugs

Acknowledgement

The authors would like to extend their thanks to Ghadi Mohammed Alotaibi, Yara Mohammed Bojan, Nada Abdulrahmn Telmesani, Ghofran Hassan Sulaimani, Leena Abdulrhaman Alharthi, Sarah Khaled Alem, Enas Mohammad Ali Munshi, Suhaila Kamal Qari, Rowaynah Walid Aziz Alrahman, Shomokh Falah Al-harbi, Shroq Abdull Alkareem Alghraibi, Batoul Farhon Gari, Rawan Mohammed Natto, Reem Mohammed Al-ghamdi, Rawabi Bakr Barnawi, Elaf Mohammed Taha Fakeih, Sabra Hasan Alyami and Raneen Khaled Al-juhani for their assistance in data collection, data entry.

Limitation of the Study

The limitations of this study were that only Makkah region was studied, therefore, these results cannot be generalized to the whole Saudi Arabia. Also, a selection bias was introduced as selection was for mothers attending the primary health care setting and data collection time limit for 6 months duration. Also, similar to any questionnaire-based survey, it is based on memorization of the respondents and data might be inaccurate

References

- [1] Hernandez-Juyol M, Job-Quesada JR. Dentistry and self-medication: A current challenge. *Med Oral*. 2002; 7: 344–7. [PubMed].
- [2] Jose J, Jimmy B, Alsabahi AG & Al Sabei GA (2013) A study assessing public knowledge, belief and behavior of antibiotic use in an omani population. *Oman Medical Journal* 28, 324
- [3] Balkhy H. H., Cunningham G., Chew F. K., et al. Hospital- and community-acquired infections: a point prevalence and risk factors survey in a tertiary care center in Saudi Arabia. *International Journal of Infectious Diseases*. 2006; 10 (4): 326–333. doi: 10.1016/j.ijid.2005.06.013. [PubMed] [Cross Ref].

- [4] Regional Strategy on Prevention and Containment of Antimicrobial Resistance, 2010-2015. [Last accessed on 2013 Jun 24]. Available from: http://www.searo.who.int/entity/antimicrobial_resistance/BCT_hlm-407.pdf.
- [5] Ganguly NK, Arora NK, Chandy SJ, Fairoze MN, Gill JP, Gupta U, et al. Global antibiotic resistance partnership (GARP): India Working Group. Rationalizing antibiotic use to limit antibiotic resistance in India. *Indian J Med Res.* 2011; 134: 281–94. [PMC free article] [PubMed].
- [6] Napolitano F, Izzo MT, Di Giuseppe G, Angelillo IF. Public knowledge, attitudes, and experience regarding the use of antibiotics in Italy. *PLoS One.* 2013; 8 (12): e84177. [PMC free article] [PubMed].
- [7] Grigoryan L, Burgerhof JG, Degener JE, Deschepper R, Lundborg CS, Monnet DL, et al. Self-Medication with Antibiotics and Resistance (SAR) Consortium. Determinants of self-medication with antibiotics in Europe: the impact of beliefs, country wealth and the healthcare system. *J Antimicrob Chemother.* 2008; 61: 1172–79. [PubMed].
- [8] Apisarnthanarak A, Tunpornchai J, Tanawitt K & Mundy LM (2008) Nonjudicious dispensing of antibiotics by drug stores in Pratumthani, Thailand. *Infection Control and Hospital Epidemiology* 29, 572–575.
- [9] Mumtaz Y, Jahangeer SA, Mujtaba T, Zafar S, Adnan S. Self medication among university students of Karachi. *JLUMHS.* 2011; 10 (03): 102–05. Abahussain E, Matowe LK, Nicholls PJ. Self-reported medication use among adolescents in Kuwait. *Med Princ Pract.* 2005; 14: 161–4. doi: 10.1159/000084633. [PubMed] [Cross Ref].
- [10] Bubake. Prevalence, determinants and practices of self-medication with antibiotics – a population based survey in Taif, Kingdom of Saudi Arabia. *Int J Res Pharm Sci* 5 (2); 51 – 56.
- [11] Pablos-Méndez A., Raviglione M. C., Laszlo A., et al. Global Surveillance for Antituberculosis-Drug Resistance, 1994–1997. *New England Journal of Medicine.* 1998; 338 (23): 1641–1649. doi: 10.1056/NEJM 199806043382301. [PubMed] [Cross Ref].
- [12] Laporte JR. Self-medication: Does information to users increase at the same rate as consumption. *Med Clin (Barc)* 1997; 109: 795–6. [PubMed].
- [13] Al-Azzam SI 1, Al-Husein BA, Alzoubi F, Masadeh MM, Al-Horani MA, Assessment of Self-Medication of Antibiotics in a Jordanian Population (2007) *Int J Occup Med Environ Health,* 20 (4); 373-380.
- [14] Richman PB, Garra G, Eskin B, Nashed AH, Cody R: Oral antibiotic use without consulting a physician: a survey of ED patients. *Am J Emerg Med* 2001; 19: 57–60.
- [15] Li R, Xiao F, Zheng X, Yang H, Wang L, Yin D, Yin T, Xin Q, Chen B. Antibiotic misuse among children with diarrhea in China: results from a national survey. *PeerJ* 2016 Nov 3; 4.
- [16] Aris Widayati, Sri Suryawati, Charlotte de Crespigny and Janet E Hiller: Self medication with antibiotics in Yogyakarta City Indonesia: a cross sectional population-based survey *BMC Research Notes* 20114: 491.
- [17] Self-medication with antibiotics by the community of Abu Dhabi Emirate, United Arab Emirates.
- [18] Khalil H., Abdullah W., Khawaja N., et al. Self-prescribed antibiotics by Saudi patients as a routine self-management of dental problems. *Life Science Journal.* 2013; 10 (4): 1939–1942.
- [19] Abdulrahman Al Rasheed, Umar Yagoub, Hesham Alkhashan, Osama Abdelhay, Ahmad Alawwad, Aboud Al Aboud, and Saad Al Battal; Prevalence and Predictors of Self-Medication with Antibiotics in Al Wazarat Health Center, Riyadh City, KSA. *BioMed Research International Volume* 2016 (2016), Article ID 3916874, 8 pages <http://dx.doi.org/10.1155/2016/3916874>
- [20] Awad A., Eltayeb I., Matowe L., Thalib L. Self-medication with antibiotics and antimalarials in the community of Khartoum State, Sudan. *J. Pharm. Sci.* 2005; 8: 326–331. [PubMed].
- [21] Belkina T, Warafi AA, Eltom EH, Tadjieva N, Kubena A, Vlcek J: Antibiotic use and knowledge in the community of Yemen, Saudi Arabia, and Uzbekistan. *J Infect Dev Countries.* 2014, 8 (4): 424-429.
- [22] Skliros E., Merkouris P., Papazafiropoulou A., Gikas A., Matzouranis G., Papafragos C., Tsakanikas I., Zarbala I., Vasibosis A., Stamataki P., Sotiropoulos A. Self-medication with antibiotics in rural population in Greece: A cross-sectional multicenter study. *BMC Fam. Pract.* 2010; 11 doi: 10.1186/1471-2296-11-58. [PMC free article] [PubMed] [Cross Ref].
- [23] G. Togoobaatar, N. Ikeda, M. Ali et al., Survey of non-prescribed use of antibiotics for children in an urban community in Mongolia, *Bulletin of the World Health Organization*, vol. 88, no. 12, pp. 930–936, 2010. View at Publisher · View at Google Scholar.
- [24] N. Nyazema, N. Viberg, S. Khoza et al., Low sale of antibiotics without prescription: a cross-sectional study in Zimbabwean private pharmacies, *Journal of Antimicrobial Chemotherapy*, vol. 59, no. 4, pp. 718–726, 2007. View at Publisher View at Google Scholar · View at Scopus.
- [25] Wijesinghea PR, Jayakodyb RL, de A Seneviratnec R. Prevalence and predictors of self-medication in a selected urban and rural district of Sri Lanka. *Who South-East Asia J Public Heal.* 2012; 1: 28–41.
- [26] Afolabi AO. Factors influencing the pattern of self-medication in an adult Nigerian population. *Ann Afr Med.* 2009; 7: 120–7. [PubMed].
- [27] Yuefeng L, Keqin R, Xiaowei R. Use of and factors associated with self-treatment in China. *BMC Public Health.* 2012; 12: 995. [PMC free article] [PubMed].