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Research Article

Prevalence, determinants and practices of self-medication with antibiotics – a population based survey in Taif, Kingdom of Saudi Aarabiaksa

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ABSTRACT

Self-medication with antibiotics is a global health problem and it leads to the emergence of resistant bacteria. The study was conducted to determine the prevalence of self-medication with antibiotics and to identify its determinants and to investigate consumers practices during self-medication. A cross-sectional population-based survey was carried out in Taif City, KSA during July-October 2014. Adults people (> 18 years) were included and interviewed through face-to-face method using a structured questionnaire. Data was processed using SPSS (version 21). Logistic analysis was used to identify determinants of self-medication with antibiotic. P value < 0.05 was considered as statistically significant. Convenience method of sampling was adopted and a total of 400 participants were included, of them 228 (57.0%) were males and 291(72.8%) aged < 40 year. Overall, 148 (37.0%) interviewees had satisfactory knowledge about antibiotics. Residents of town were more knowledgeable than outside- town dwellers, (38.8% vs. 4.8% respectively),[OR 14.4 (1.9-109.5), (P= 0.010)]. Out of all participants 391 (97.8%) used antibiotic during the last year, of them 315 (80.6%) self-medicated themselves with antibiotics. Multivariate analysis identified male gender as the only factor that significantly associated with self-medication practice [OR 1.8 (1.1-3.1), (*P*= 0.018). The majority (90.5%) obtained antibiotics for self-medication from community pharmacies. Self-medication with antibiotics was prevalent among the studied population. Great efforts are needed to educate the public and to develop and implement stringent polices to limit over- the- counter sale of antibiotics in community pharmacies.

Key words: Prevalence, Determinants, Practices, self-medication, Antibiotics

INTRODUCTION

Self-medication is the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms and it is considered as one element of self-care[1]. Several factors that lead to self-medication were quoted in the literature. The presence of chronic illness and older age were found to be associated with the consumption of over-the- counter drug and self-medication practice[2]. Some individuals do not want to seek a medical help for minor illnesses and considered themselves have good experiences with self-medication[3]. Ramay et al reported that female visited the pharmacy more often than male to self-medicate and perceived little risk in its practice[4]. In addition, literacy and public health education were identified as major factors that affect the pattern of self-medication[5]. Self-medication with antibiotics was documented in different developed and developing countries with different prevalence rates and determinants . Bonkor et al[6] reported a 70% prevalence rate with 35% of the respondents suffered from treatment failure. In China Pan et al[7] found a prevalence rate of 47.8% of self-medication with antibiotics among university students. They identified prior knowledge, older age and higher allowance as important risk factors associated with self-medication practices. Nearly 40% of the respondents participated in a study conducted in Jordan practiced self-medication with antibiotics with a main reason for self-medication was the previous experience on the efficacy of treatment [8]. Lower rate of 7.3% of self-medication to treat minor upper respiratory tract infection was documented in

a population-based survey in Indonesia with gender, health insurance and marital status as predicators of the intension to self-medication [9]. In a rural setting and within the past 12 months prior a study conducted in Greece 44.5% of the participants admitted the use of non-prescribed antibiotic with a third quarter of them obtained these drugs from community pharmacies[10]. High prevalence of self-medication with antibiotics was identified in Lithuania treat mainly tonsillitis, bronchitis, and upper respiratory infections[11]. The situation In Saudi Arabia as documented in few studies was not better than observed in the above mentioned countries. In the capital of the country consumers were found to be with poor knowledge and awareness with the consequences of using medicines without prescriptions and antibiotics were ranked as top agents used for self-medication[12]. Consumers in the Eastern part of the country used antibiotics without medical advice not only for treatment but also for prophylactic purposes [13].In a survey in the Central Region of the country; low income, having more than two children, parents' poor knowledge about antibiotics, inappropriate beliefs and practices were identified as risk factors for self-medication of children with antibiotics [14]. This study was conducted in Taif City in the Western part of the country to identify gaps in knowledge of Saudi consumers about antibiotics, determine the prevalence of self-medication with these agents, to identify determinants of self-medication (if any) and to investigate consumers practices during self-medication.

MATERIALS AND METHODS

A cross –sectional population-based survey was conducted in Taif, Saudi Arabia during four month period (July-October 2014). Interviewers met with the participants in public places in Taif City (malls, restaurants, parks, etc..). Saudi adults (18 years) from both gender were included. Consumers self- medicated themselves with topical antibiotics and who refused to participate were excluded. Convenience method of sampling was adopted and the sample was calculated based on the last population census[15].The data was collected by semi-final pharmacy students through face-to-face interview method using structured questionnaire. The questionnaire was adapted from standardized questionnaire with slight modifications[16]. It was into Arabic language using forward-backward translation method in collaboration with English Language Center, Taif University, Kingdom of Saudi Arabia. The first part of the questionnaire was designed to collect data on: participants background characteristics (gender, age, residence, marital status, educational level, current employment status, and monthly income). The second part was designed to collect data on respondents' general knowledge on antibiotics through four structured questions: What are antibiotics used for and effect of high doses in patient faster recovery, effect of low dose in the prevention of adverse reactions and the association of irrational drug use of antibiotics with the emergence of bacterial resistance. Participants who successfully answered all knowledge questions correctly were classified as having satisfactory knowledge about antibiotics. The third part covered interviewees' self-medication practices: using antibiotics without medical prescription or not in the previous 12 months, frequency of self- medication during that period, reasons for self-medication, symptoms or diseases for using antibiotics, source of obtaining antibiotics, duration of use, source of information about the selected antibiotic regarding effectiveness, dosage and safety. Also this part contained questions on frequencies of changing the dose, switching to another antibiotic and time of stopping antibiotic. The questionnaire was tested with a group of ten participants to clarify structure and language. Minor changes were suggested and adopted in the final questionnaire. Data was processed using the Statistical Package for Social Sciences (SPSS) software (version 21). Descriptive statistics were used to describe all variables. Multi variable logistic analysis was used to identify predictors of both knowledge and self- medication practices. Predictors variables include the socio- demographic characteristics of the participants which include; gender, age, residence, level of education, marital status, occupation and monthly income. P values of <0.05 was considered statistically significant.

RESULTS

Participants' demographic characteristics:

A total of 400 participants were included in the study, of them 228 (57.0%) were males and 291(72.8%) aged <40 year. Residents of town were 379 (94.8%) and 303 (75.8%) attained university educational level. Table (1) showed participants' demographic characteristics.

Table 1: Participants background characteristics

Background characteristic	Frequency	Percent
Gender		
Male	228	57.0
Female	172	43.0
Age in year		
< 40	291	72.8
≥40	109	27.3
Residence		
Town	379	94.8
Outside town	021	05.2
Educational level		
University	303	75.8
Below University	097	24.2
Marital status		
Married	281	70.3
Single	119	29.7
Occupation		
Working	294	73.5
Not working	106	26.5
Monthly income in SR		
< 10000	227	56.8
>10000	173	43.2
Total	400	100

Participants' knowledge about antibiotics:

Slightly more than two third of the interviewees believed that antibiotics can be used to treat viral or both bacterial and viral infections. Nearly 20% of the participants thought that higher doses of antibiotics result in faster recovery compared to 29.5% had the misconception that lower doses result in less adverse reactions. The contribution of irrational use of antibiotics to the emergence of drug resistance was known by 258 (64.5%), patients responses to knowledge items were shown in table (2). Overall, out of all interviewees 148 (37.0%) were classified as having satisfactory knowledge about antibiotics. Multivariate analysis identified residence as an important background characteristic that significantly associated with satisfactory knowledge about antibiotics, residents of town (38.8%) were more knowledgeable than outside town dwellers (4.8%), [OR 14.4 (1.9-109.5), (P= 0.010)], as shown in table (3).

Table 2: Participants ' knowledge about antibiotics

Question	Frequency	Percent
Antibiotic used to treat		
Viral infection	128	32.0
Bacterial infection	124	31.0
Viral+ bacterial infection	143	35.7
Others	003	01.3
Higher doses result in faster recovery		
Yes	078	19.4
No	259	64.8
Don't know	063	15.8
Lower doses result in less adverse reactions	118	29.5
Yes	180	45.0
No	102	25.5
Don't know		
Irrational use of antibiotics lead to bacterial resistance	258	64.5
Yes	066	16.5
No	76	19.0
I don't know		

Table 3: Determinants of participants' knowledge about antibiotics

Covariates	% Yes	n	Univariable analysis crude OR(95% CL)	P value	Multivariable analysis adjusted OR(95% CL)	P value
Gender Male Female	39.9 33.1	228 172	1 1.3(0.9-2.0)	0.165		
Age group in year > 40 ≤ 40	35.7 40.4	291 109	1 0.8 (0.5-1.3)	0.394		
Residence Town Outside	38.8 04.8	379 21	1 12.7(1.7-95.4)	0.014	1 14.4(1.9-109.5)	
Educational level University Below university	38.6 32.0	303 97	1 1.3(0.8-2.2)	0.238		
Total		**400**				

Self-medication practices

Out of all participants 391 (97.8%) used antibiotics during the last year, of them 315 (80.6%) self-medicated themselves with antibiotics. Multivariate analysis identified male gender as the only factor that significantly associated with self-medication practice [OR 1.8 (1.1-3.1), (*P*= 0.018)], as shown in table (4), regarding the reasons for self- medication, 235 (74.6%) consumers practiced it because of its convenience.

Table 4: Predicators of self-medication with antibiotics

Covariates	% Yes	n	Univariable analysis crude OR(95% CL)	P value	Multivariable analysis adjusted OR (95% CL)	P value
Gender Male Female	84.0 75.9	225 166	1 1.7(1.0-2.8)	0.047	1 1.8(1.1-3.1)	0.018
Age group in year > 40 ≤ 40	79.5 83.3	288 108	1 0.8(0.4-1.4)	0.393		
Residence Town Outside Town	80.3 85.0	371 020	1 0.7(0.2-2.5)	0.608		
Educational level University Below university	79.7 83.3	295 096	1 0.8(0.4-1.4)	0.430		
Marital status Married single	80.6 80.5	273 118	1 1.0 (0.8-1.2)	0.986		
Occupation Working Not working	79.0 84.8	286 105	1 0.7(0.4-1.2)	0.206		
Monthly income SR ≤10000 >10000	79.0 82.6	219 172	1 0.8(0.5-1.3)	0.337		
Total	**100**	**391**				

Most of the participants 218 (69.2%) selected antibiotics for self-medication based on a recommendation from community pharmacists and nearly 48% their selection based on antibiotic type. The majority of participants 285 (90.5%) obtained antibiotics form community pharmacies.

Table 4 (a): Practices during self-medication with antibiotics

Practice	Percent (n= 315)	Practice	Percent (n= 315)
Number of self-medication		**Changing the dose**	
Once	19.0	Yes, always	06.3
Twice	31.1	Yes, sometimes	36.8
Trice	23.8	Never	56.8
More	19.7		
Don't remember	06.3		
Basis of Selection of antibiotic		**Switching to another antibiotic**	5.7
Recommendation of	69.2	Yes, always	37.5
community pharmacist	23.5	Yes, sometimes	43.5
Opinion of family member	14.9	Never	
Opinion of a friend	39.7		
Own experience	36.8		
Previous doctor prescription	1.3		
others			
Factors considered for selection of antibiotic		**Number of antibiotic taken during single illness**	
Type of antibiotic	47.9	One	83.2
Brand of antibiotic	11.7	Two	15.6
Price of antibiotic	35.6	Three	1.3
Indication for use	46.7		
Adverse reactions	19.4		
Others	03.8		
Source of antibiotic		**Take the same antibiotic with different names at the same time**	
Community	90.5	Yes	20.3
Pharmacies	19.0	No	79.7
Leftover	02.5		
others			
Checking instructions in package insert		**Stop antibiotic use**	
Yes, always	41.6	After symptoms disappear	37.1
Yes, sometimes	45.4	After a few days regardless of the outcome	13.7
Never	13.0	Few days after recovery	28.6
		After the antibiotic ran out	14.6
		At the completion of the course	27.6
		after consulting a doctor/pharmacist	
		Others	
Dose determination			
Consulting doctor	24.1		
Consulting pharmacist	60.0		
Family member	12.4		
Internet	05.4		
Media	01.3		
Previous experience	27.9		
Guessing	04.1		

Sixty percent of the consumers determined antibiotic dose by consulting a pharmacist. Slightly more than 56% of the participants admitted that they never change the dosage of antibiotics deliberately during the course of treatment. The main reasons for changing the dose as disclosed by the participants were worsening condition, improving condition and the drug was insufficient to complete the treatment 37.5%, 27.9 and 22.8% respectively. Of the consumers, 118 (37.5%) admitted that they sometimes switch to another antibiotic during self- medication compared to 18 (5.7%) others did it always. The major reasons for switching were the former antibiotic did not work and the former antibiotic ran out 62.5% and 18.3% respectively. Participants who stop antibiotic after symptoms disappear were 117(37.1%). However, 43(13.7%) stopped it after few days regardless of the outcome. When asked about the practice of self-medication with antibiotics for self health care 64 (20.3%) of the participants said that "it is a good practice" while172 (54.6%) considered it acceptable practice and 79 (25.1%) considered it not acceptable practice. Out of all participants practiced self-medication with antibiotic 123 (39.0%) thought they can treat common infectious diseases with antibiotic successfully, while 146 (46.3%) were not sure and 46 (14.6%) said "they cannot".

DISCUSSION

The study of irrational use of antibiotics by the public is an important issue due to its serious related medical, societal and economic consequences. Self-medication with these agents is considered as one of the malpractices that need to be investigated in -depth to understand why people practice it and what are the predicators of this behavior. One of the aims of this survey was to measure respondents' knowledge about antibiotics. Despite the fact that nearly three quarter of the interviewees attained university level of education; the results indicated poor knowledge about antibiotics. The finding is bad indicator reflecting the absence of public education on antibiotics. Respondent's residence was identified as an important predictor of knowledge about antibiotics, town dwellers were more knowledgeable. The observed difference may be attributed to the difference in the provided and access to the media. Town dwellers have many chances to come across considerable information about antibiotics from different health facilities and well-trained healthcare providers. The second aim was to identify the prevalence of self-medication and its determinants. The results showed that self-medication was highly prevalent in this setting and it was in agreement with the rate identified in another study [17] and higher than the rates of 18.7% and 43% quoted in other studies [18]and [19]respectively.Many reasons may justify the observed high rate of self-medication. Firstly, the misconception that antibiotics are used to treat viral infection is strongly linked to consumers practice in using these agents to treat minor upper respiratory tract infections of viral etiologies. The study area is a high altitude one with variations in the weather during the year which subject consumers to multiple common colds attacks. Secondly, despite the fact antibiotics sale without prescription was forbidden by health authorities, they are available for sale as over-the-counter medicines. Stringent policies are urgently needed to ban antibiotics sale as over-the-counter agent. In this respect, heath authorities can best utilize the experience of some countries which successfully implemented such policies. Pharmacies owners as investors should be involved in the formulation of such policies to ensure their commitment. Thirdly, as disclosed

by the participants the acquisition of antibiotics from community outlets is convenience compared to visiting health care facilities for illnesses they considered it as minor ones. Similarly researchers in the above mentioned study [6] reported that the main reasons for self-medication were decreased cost and medical care in hospitals associated with long delay. As documented in the current study nearly third quarter of the interviewees was either employees or doing their own private business. Most probably they will not find enough time to visit healthcare facilities despite the fact that these facilities are well-distributed in the city. Health authorities can establish clinics governmental workplaces to enhance access to medical services. On the other hand, males were practiced self-medication more than females. This finding can be linked with the above mentioned one, as most of the females were housewives who have enough time to seek a medical advice at the health care facilities. In contrary, other researchers documented high prevalence of self-medication with antibiotics among women compared to men[20].It was expected that respondents' higher educational level increases their awareness about the consequences of irrational use of antibiotics without prescriptions, but unfortunately it was not. In contrast, in study in Albina the impact of this factor was obvious, as adult with low and medium educational level were most likely to self-medicate themselves [21]. The third aim was to investigate the consumers' practices during the process of self-medication. Analysis of the respondents' practices during self-medication revealed many misconceptions. Most of the participants selected antibiotics based on recommendations from pharmacists, however others consults friends, family members and depend on previous experience. The role of healthcare providers is to advice the patients not to repeat antibiotic if he/she experience the same symptoms. In some recurrent infections the causative agent may be resistant or acquired resistance during the first course of therapy, so using the same antibiotic will increase patient suffering. Consultation of the pharmacist was a positive finding, but the pharmacist should be aware and has the proper knowledge to handle such cases. In Hong Kong a considerable number of the public interviewed agreed about to consult a pharmacist before using over-the-counter drugs [22]. Nearly 37% of the respondents stop antibiotics after disappearance of the symptoms and did not complete the course of therapy. In contrast, 46% of the participants in the above mentioned survey[6] did not comply with the completion of the full course of therapy. Another serious findings documented in the current study was that a considerable number of interviewees sometimes change antibiotic dose and switching to another antibiotic for different reasons. Similarly such practices were observed in China, as over 44% of participants in that study had changed antibiotic dosage and 36.5% had switched to another antibiotic during the treatment course [23]. This study was not without limitations. Firstly, it was conducted in Taif City which may limit the generalizability of the results to all country. In the future and in order to in-depth investigate self-medication practice large number of people need to include from different regions in the Kingdom. Secondly, respondents depend on their memories to recall their practice of using antibiotics during the last year so recall bias are expected. Thirdly, the number of male participants included in the study was more than females. Culturally In Saudi and particularly in the study area it is difficult to recruit females in such type of studies. In conclusion, self-medication with antibiotics was prevalent in Taif City and it was significantly associated with male gender. The participants had numerous misconceptions during the process of practice self-medication which contribute badly to the identified irrational use of antibiotics. Public education at all level is needed together with stringent policies to ban or reduce over-the–counter sale of antibiotics in community pharmacies.

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