Original Article

Iranians' Self-Report Knowledge and Practice about Arbitrary Use of Antibiotics

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ABSTRACT

Introduction: Scientific studies revealed a high prevalence rate of self-medication among Iranians, nevertheless there are few studies exploring the factors affecting on.

Aim: This study was conducted to detect the knowledge and behaviour of individuals who take antibiotics arbitrarily.

Materials and Methods: The research population included all Iranian men and women between 20 and 60 years. The sample size based on previous studies and after applying the correction factor 1.6. Total of 950 subjects were involved in this cross-sectional study. Face and content validity (qualitative) tool was confirmed by expert faculty members. It was estimated based on Cronbach's alpha reliability 0.73. After coding, all data were entered into SPSS and analyzed.

Results: The mean and SD of knowledge was 4.58±0.65. Sore throat (80%) and runny nose (70%) were the most common causes of antibiotic consumption in the participants. The most common reason for antibiotic use was its availability. More than 68% of participants said they never read the brochure of antibiotics. More than 51% of them were unable to understand the content of the brochure. There was a positive relation between participants' knowledge and performance. More than 60% of them had a history of dosage change.

Conclusion: Results of present study revealed that the study population did not possess the requisite knowledge about the appropriate behaviour in the use of antibiotics. It is recommended to do some educational program in order to improve their knowledge and behaviour. Further studies with larger sample in this regard are recommended.

INTRODUCTION

Arbitrary use of drugs, especially antibiotics, is a common problem in Iran. According to the figures, the rate of drugs consumption in Iran is three times more than the global average rate [1-3]. Scientific studies have revealed the various prevalence rates of self-medication, and that there are some factors leading to arbitrary use of drugs among Iranians. For example, rate of self-medication among Iranians estimated in different studies were 33.7% [2], 83% [3], 36% [4] and 26% [5]. Self-medication or arbitrary use of drugs can be defined as the use of medicines by people in order to treat self-recognized or self-diagnosed diseases [1]. It is a medical behaviour of individuals, commonly used for subsiding the primary symptoms of diseases as the first choice [2]. Self-medication is defined as all the activities done by people and communities for health improvement, disease prevention, and health recovery [6]. Also, self-medication is consumption of one or more drugs without a doctor's prescription [7]. The main reasons for self-medication are- history of same symptoms [2], accessibility of drugs [2,3], perceived mildness of risks [3,4], low attention to side-effects [4], past medication [2,4], office rush's and high fees of clinics [2-4]. It is obvious that antibiotics are useful against infectious diseases, but arbitrary use of antibiotics may lead to antimicrobial resistance, which is a current and ongoing threat to human life [8,9].

In spite of the high prevalence of self-medication in Iran, it is supposed that the main action to prevent self-medication is education. In this regards there is no nationwide study to explore the general population's knowledge about this problem in Iran. This cross-sectional study was conducted in Iran in order to detect the knowledge and behaviour of individuals who take antibiotics arbitrarily.

MATERIALS AND METHODS

Study design: This cross-sectional epidemiological study was carried out from April 2016 to June 2016 based on survey design. The inclusion criteria were that participants had to be Iranian between 20 to 60-year-old and with the ability to complete the questionnaire in Persian language. The purpose of research was described to all the participants and informed consents were obtained.

Participants: Iran consists of 31 provinces, and near eighty million people. We selected 12 provinces randomly{Isfahan (known as the half of the world), Qom, Tehran, Gilan, Qazvin, Sistan, Central Khorasan, Khoozestan, East Azarbayjan, Alborz, Yasuj and Ardabil}. Sample size was calculated with formula: $n=z^2 \cdot Pq/d^2$ and using the convenience sampling method 950 participants were enrolled in the study (about 80 participants from each province).

Data Collection: In order to gather data a researcher-made questionnaire was used based on the aim of research and according to the scientific literatures [4,5,7]. It was composed of three sections: A) Antibiotic consumption behaviour; B) Knowledge about antibiotics; and C) Demographic data. In order to achieve the psychometric criteria, content validity and reliability were evaluated.

Ten experts (pharmacist and PhD in health education) viewed the questionnaire in order to approve the content and face validity. The alpha-cronbach for test-retest reliability in twenty participants was 0.85. Out of total 950 participants, 683 (71.8%) answered yes to the first question in section A; (Did you already have an arbitrary use of antibiotics?). These participants were asked to complete all sections and the others were conducted to answer the sections just B, and C. The knowledge assessment questions had two options; "Yes", and "No". Questions 1 to 8 scored as; 1 (Yes) and 0 (No) and question 9 and 10 scaled as; 0 (Yes) and 1 (No). Minimum and maximum expected score for knowledge was 0 to 10, respectively.

Direct contact with the respondents allowed us to inform them about the research's objectives and assure the respondents about the anonymity and confidentiality of research.

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences software (SPSS, version 16.0) was used for statistical analysis. All gathered data were coded and entered in, then using descriptive analysing methods

means and standard deviations of variables were calculated and next, their differences according to gender, literacy and residency were analysed with χ^2 parameter. A p-value less than 0.05 was considered significant.

RESULTS

Demographic Data: Demographic data of the participants are shown in [Table/Fig-1]. The majority of respondents (n=608) were in 20-40-year-old. About 52% (n=493) were male and near to 50% (n=465) were married. Near to 92% (n=873) stated to have an insurance and most of the respondents (n=701) were graduated.

Self-report knowledge: Participants' knowledge about antibiotics is shown in [Table/Fig-2]. Mean and standard deviation of participants' knowledge was 4.85±0.65. All participants stated that they have not been educated about antibiotics. Most of participants were unaware about better time (610, 64.3%), importance of on-time consumption (582, 61.3%), common side effects (702, 73.9%), wide-spectrum one (761, 80.2%), and about better dose (630, 66.4%) of antibiotics. Near to 81% (n=768) of participants stated that high-dose antibiotics lead to immediate healing.

Self-report practice: As shown in [Table/Fig-3], out of 683 participants who already had arbitrary use of antibiotics, 213 (31.1%) and 195 (28.5%) participants stated that they have taken antibiotics arbitrarily 2 and 3 times in recent year, respectively. Also, 51.2% (350) reported that they do not understand the antibiotics instruction. The most common reason to use it arbitrarily was its accessibility (432, 63.2%). More than half percent of participants stated that the feasibility of consumption leads to arbitrary use (386, 56.5%). According to the participants' statements, sore throat (432, 63.2%), and running nose (478, 69%) were the common situation of

Demographic variable	N(%)	Knowledge	p-value
Age (years) 20- 40 41-60	 608(64) 342(36)	 5.30±0.25 4.65±0.33	 0.214*
Gender Male Female	 493(51.8) 457(48.1)	 5.00±0.35 4.22±0.44	 0.125*
Marital status Single Married	 485(51.1) 465(48.9)	 4.25±0.32 4.88±0.41	 0.104*
Literacy Non-academic Academic	 249(26.2) 701(73.7)	 3.45±0.90 5.36±0.42	 0.034**
Insurance Yes No	 873(91.8) 77(8.1)	 4.08±0.23 5.22±0.80	 0.118*

[Table/Fig-1]: Distribution of knowledge, and practice according to demographic characteristics of the participants.

No	Items	Yes; N(%)	No; N(%)
1	Do you know the better time of usage?	340(35.7%)	610(64.3%)
2	Do you know the importance of on-time usage?	368(38.7%)	582(61.3%)
3	Do you know the common side effects of antibiotics?	248(26.1%)	702(73.9%)
4	Do you know the wide-spectrum antibiotics?	189(19.8%)	761(80.2%)
5	Do you know the better dose of antibiotics?	320(33.6%)	630(66.4%)
6	Do you know the better route of administration?	201(21.1%)	749(78.9%)
7	Does arbitrary use lead to mistreatment?	259(27.2%)	691(72.8%)
8	Does arbitrary change lead to mistreatment?	329(34.6%)	621(65.4%)
9	Does high dose usage lead to immediate healing?	768(80.8%)	187(19.2%)
10	Does low dose usage lead to lower side effects?	803(84.5%)	147(15.5%)

[Table/Fig-2]: Participants' knowledge about antibiotics.

No	Items	N	%
1	If yes, how many times in recent year? 1 time 2 times 3 times More than 3	 159 213 195 116	 23.2 31.1 28.5 16.9
2	Why do you do it arbitrarily? Because; It is cost benefits It is accessible It is easy Any trust on doctors	 349 432 386 298	 51.0 63.2 56.5 43.6
3	In what case/s do you have it arbitrarily? Runny nose Coughing Sore throat Fever Headache Vomiting Diarrhea Skin rashes	 478 396 549 432 128 89 149 218	 69.9 57.9 80.3 63.2 18.7 13.0 21.8 31.9
4	What are your criteria for antibiotic selection? Friends' advices Pharmacy's advices Family's advices Previous experiences Previous prescription	 218 248 301 412 432	 31.9 36.3 44.0 60.3 63.2
5	From where do you take your antibiotics? Pharmacy Previous residues	 324 482	 47.4 70.5
6	Do you read the instructions before use? Yes, always Yes, seldom Never	 89 128 466	 13.0 18.7 68.2
7	How do you measure the dose of antibiotics? Base on the instruction Doctor's consultation Pharmacy's advices Friends' advices On internet Previous orders	 105 89 148 201 128 349	 15.3 13.0 21.6 29.4 18.7 51.0
8	Have you ever changed the dose of antibiotics arbitrarily? Yes No	 411 272	 60.1 39.8
9	If yes, why did you change? To get better soon To decrease the side effects I did not have enough	 428 236 219	 62.6 34.5 32.0
10	Have you ever change the type of antibiotics arbitrarily? Yes No	 368 315	 53.8 46.1
11	If yes, why did you change? Was not effective Was finished Was expensive Had adverse effects	 243 189 179 72	 35.5 27.6 26.2 10.5
12	Do you understand the antibiotics' instructions? Yes No	 600 350	 48.8 51.2

[Table/Fig-3]: Participants' practices about antibiotics.

arbitrary use. The majority of participants used to select the antibiotics (432, 63.3%), and measured the dose (349, 51%), too, based on the previous physician's orders. More than 60% of participants stated that they have changed the doses during self medication. More than half (53.8%) used to changed the type of antibiotics, arbitrarily. Amoxicillin (Cap.), Ampicillin (Cap.), Metronidazole (Tab.), Erythromycin (Syr.), and Tetracycline (Oint.) were the most common antibiotics.

Correlation and Relation: The relations between knowledge, demographic characteristics, and some behavioural items are shown in [Table/Fig-1,4]. The participants in academic literacy level revealed more knowledge about antibiotics and there was a significant difference between mean of knowledge and the two literacy levels (p=0.034). There was not any significant difference between mean of knowledge according to other demographic data

Behavioural characteristics	Knowledge	p-value
Did you already have an arbitrary use of antibiotics? Yes No	3.41±0.41 6.22±1.11	0.002**
Have you ever changed the dose of antibiotics arbitrarily? Yes No	4.12±0.32 5.67±0.42	0.041**
Have you ever change the type of antibiotics arbitrarily? Yes No	3.48±0.65 4.75±0.49	0.038**

[Table/Fig-4]: Relation between knowledge and some behaviour characteristics.

[Table/Fig-1]. Also, there was a significant difference between mean of knowledge and arbitrary use (p= 0.002), changing the dose (p=0.04) and changing the type of antibiotics (p=0.038) {shown in [Table/Fig-4]}.

DISCUSSION

It is true that arbitrary use of antibiotics is a common problem among Iran and other developing countries. Although there is not any precious figure about the rate of self-medication among Iranian, informal reports have mentioned that Iranians have the highest rate of it [11,12]. In the current study we aimed to explore the knowledge and practice about antibiotics consumption among Iranians. The results showed that the majority of the participants did not possess the adequate knowledge about antibiotics consumption in addition to their misconception about antibiotic usage. Most of the participants used left-over antibiotics. In a cross-sectional study in 2016, Jamhour A et al., examined the antibiotic knowledge and self-medication practices in a developing country (Lebanon), explored that 61% of the respondents thought that antibiotics should be taken for common cold. Self-medication significantly correlated with a lower educational level. Those with lower knowledge have worst behaviour [10]. Also, Banerjee I et al., in the similar cross-sectional study among medical students in Nepal found the same results. They recommended improving medical student's awareness about the pros and cons of self-medication in order to motivate them for rational use of antibiotics [11].

Exploring the reasons for self medication is very important. In the current study the majority of participants used the leftover antibiotics for sore throat and running nose. They tried to change the dose and type of antibiotics during self medication. In addition, individual with higher knowledge had lower tendency to self-medication. All of the participants stated that they have not been educated about antibiotics. In a systematic review and meta-analysis about the burden, risk factors and outcomes of self medication in developing countries, Ocan M et al., found that the major sources of antimicrobials included, pharmacies, leftover drugs and drug shops. Also, they explored that the main determinants of antimicrobial self-medication include, level of education, age, gender, past successful use, severity of illness and income [12].

Jorgji K et al., in 2014 conducted a similar study aimed to explore the self-medication among young adults. They found that the most common reasons for self-medication were fever, sore throat and cough. Also, they observed that the most common source of information regarding self-medication is the pharmacy and most common antibiotic used as self-medication is amoxicillin [13]. Shah SJ et al., in a cross-sectional study explored the self-medication with antibiotics among non-medical university students of Karachi. They found that about 61% of the participants did not meet the adequate knowledge about antibiotics; also, amoxicillin was the most self-prescribed antibiotic [14].

Biswas M et al., in a similar cross-sectional study in Bangladesh, found that more than 26% of the participants had experienced self medication with antibiotics. The key reasons for the self-medication of antibiotics was the pre-experience, suggestions from others and knowledge of the antibiotics. The perceived symptoms to use the antibiotics were dysentery, diarrhea and food poisoning; cold, cough and fever; infection, dental caries and toothache; irritable bowel syndrome, acne, ear and throat pain [15].

In the current study, most of participants strongly believed that a high dose of antibiotics leads to immediate healing of infections. The most common reasons for antibiotic use in Yemen, Saudi Arabia, and Uzbekistan were cough and influenza. Belkina T et al., also found that awareness of the dangers of antibiotic use correlated inversely with self-medication, understanding of the appropriate use of antibiotics was limited. Forty-nine percent of respondents discontinued antibiotics when they felt better [16]. In a similar study in Nigeria, Enato EF et al., explored that the majority of the ill persons self-treated by using antibiotic and antibacterial drugs. Symptoms such as fever, chills, joint pain, headache, gastrointestinal problems and upper respiratory symptoms were most common situation for self medication [17].

The current study had some limitations. All data was gathered via a self-report questionnaire; so it is obvious that some biases may have taken place. The survey was conducted nationally among 12 provinces in Iran, with large sample size of 950 participants who were selected in multilevel sampling methods. However, in order to save time, we used a short and valid questionnaire; which might not covered all aspects of topic.

CONCLUSION

The current study revealed that the average knowledge of Iranians about antibiotics is not satisfactory and most of them take it arbitrarily. It is very important to conduct community based educational program in order to develop a rationalized consumption of antibiotics. Further studies in this regard are recommended strongly.

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