

Self-medication for Oral and Non-oral Conditions among Visitors of Outpatient Clinics- Alexandria- Egypt

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: To assess the prevalence of self-medication for non-oral and oral conditions and associated factors.

Study Design: Cross-sectional study.

Place and Duration: The outpatient clinics of Alexandria University teaching hospital, Alexandria, Egypt in 2015.

Methodology: Visitors responded to a pilot-tested Arabic questionnaire that collected information about medical and dental histories, self-medication and its reasons. The study outcomes were the most frequent non-oral and oral conditions for which antibiotics self-medication was used. Regression analysis was used to assess the association with independent variables and the relationship between the two outcomes.

Results: The response rate was 94.3%. The prevalence of antibiotics self-medication for non-oral and oral conditions was 31.6% and 19.4%. The most frequent non-oral and oral conditions where antibiotics self-medication occurred were common cold and toothache (26.3% and 18.2%).

Perceiving the condition as non-serious and leftover medications were associated with higher odds of antibiotics self-medication for common cold and toothache (OR= 1.99, 1.99 and 2.84, 1.81). Antibiotics self-medications for the two conditions were strongly associated (OR= 52.00).

Conclusions: Self-medications for oral and non-oral conditions are associated and related to modifiable factors including how serious the patients perceive their condition to be and if they have access to left-over medication.

Keywords: Anti-bacterial agents; common cold; dental; self-medication; toothache.

1. INTRODUCTION

Self-medication is the use of medication without prescription or consultation by healthcare providers [1]. A 2015 systematic review of antimicrobials self-medication reported a prevalence of 39% in developing countries and 34% in Middle East countries [2].

Individuals use self-medication to care for themselves or their families, especially when the problem is mild and is considered not requiring medical evaluation [3]. Done correctly, it may offer an alternative to formal health care systems. Because health care professionals are not involved, they may have more time to care for major health problems thus reducing expenses [2,4]. However, self-medication may lead to incorrect application of drugs' or their dose causing drug-drug interactions and side effects [5], with serious health consequences [3, 5]. For example, antibiotics self-medication is associated with the emergence of antibiotic-resistant strains and super infections, misdiagnosis and masking the symptoms of existing disease [6]. Reported negative outcomes of self-medication also included allergies and even death [7,8]. Adequate information on safe use of medications plays an important role in ensuring its correct use [9].

In developing countries, self-medication may be practiced because of economic, individual and cultural reasons to relieve symptoms. Health care system factors including provider characteristics, cost of care, structure of the system and insurance coverage are also known to affect self-medication [10]. The prevalence of self-medication varies by disease and medication type [3,11]. The increased use of over the counter (OTC) medication in place of prescription medication contribute to greater prevalence of self-medication [12]. A systematic review of studies from developing countries reported that the main determinants for self-medication with antimicrobials were gender, age, education,

income, severity of illness and past successful use [2].

Oral problems may be associated with self-medication due to additional factors such as dental anxiety and fear acting as deterrent to seeking professional care [13]. Cost of dental care may negatively affect care seeking leaving self-medication as an alternative. Studies assessing the determinants of self-medication for oral conditions reported that people who self-medicated were usually unmarried, urban residents and young [6,14,15]. It is not known whether there is a difference in prevalence between self-medication for non-oral and oral conditions or whether their determinants differ. Better understanding of this relationship helps in planning health education activities and in informing policy makers across sectors of the health care system.

Physician and dentist to population ratios in Egypt are one of the highest in the Middle East [16]. At the same time, the cost of medicines for patients treated in public facilities are twice as affordable as those in private facilities [17]. This setting provides an opportunity to study the factors associated with self-medication in individuals with low socio-economic status where there is no problem in health care professionals' availability and where medicines such as antibiotics are relatively affordable.

The aim of this study was to investigate a group of patients visiting the university teaching hospital in Alexandria, Egypt, as an example of a developing country with available health care professionals and affordable medicines. The investigation focused on their self-medication for oral and non-oral conditions; specifically, to assess (1) the prevalence of self-medication using antibiotics, (2) factors associated with self-medication and (3) whether there is a difference between self-medicating for oral and non –oral conditions.

2. MATERIALS AND METHODS

The authors of this manuscript have certified that they comply with the principles of ethical publishing. The Ethics Committee, Faculty of Medicine, Alexandria University approved this cross-sectional study conducted in 2015 (IRB # 00007555). Helsinki declaration guidelines were followed. Subjects were informed that participation was voluntary and not related to receiving care. Implicit consent was indicated by answering the questionnaire.

Subjects were included in the study if they were (1) adults (≥ 18 years old), (2) Egyptian, (3) able to answer the questionnaire, (4) seeking care in the outpatient clinics, main teaching hospital, Alexandria University, and (5) willing to participate in the study. Sample size was estimated using these assumptions: power=80%, alpha error=0.05 and odds ratio that a subject would self-medicate for oral conditions provided he self-medicates for non-oral conditions=2. Using PASS (NCSS, LLC), the calculated sample size was 373, increased to 400 to allow for non-response. Consecutive visitors of the clinics on successive days were invited to participate.

An anonymous questionnaire was developed based on previous studies [2,10,13]. It consisted of five sections (1) background information, (2) medical/ dental history, (3) experience with the health care system, (4) self-medication practices and (5) reasons for self-medication. The questionnaire was pilot tested on 20 subjects whose data was not included in the analysis and questions were modified for clarity. Two experts (a dentist and a physician) not participating in the study checked the questionnaire for face and content validity.

Four interviewers distributed the questionnaire, explained it to participants and collected it back. They received two-hours training on explaining the questionnaire the response options and how to elicit and record interviewees' responses. They worked in teams dividing a clinic's visitors until all eligible visitors were approached. Subjects were recruited from various outpatient clinics except for the dental clinic to reduce selection bias. The interviewer approached the subject, explained the study purpose, secured consent and recorded the responses.

In section 4 of the questionnaire, a question assessed self-medication using antibiotics for 8 conditions; 5 non-oral (headache, common cold,

cough, stomach ache blood pressure problems) and 3 oral (toothache, gum problems and tooth extraction). Participants were given examples of antibiotics available in the market so that they do not mix antibiotics with other medication. We identified the most common oral and non-oral condition and they were the outcome variables. The independent variables included:

- 1) Background variables: age, gender, marital status, number of children and education,
- 2) Medical history including smoking, having non-oral diseases and oral diseases and perception of general and oral health (ranging from 0 to 10, 10 being excellent health),
- 3) Experience with the health care system: whether the subject had health insurance, if he had difficulty accessing health services and if he was satisfied with the services he obtained,
- 4) Reasons for self-medication: including cost of consultation, limited time, availability of physician/ dentist, prescribed medication not effective, prescribed medication caused side effects, condition perceived as non-serious or not requiring professional care, having leftover medication, preferring to use medication tried before and found effective, acute manifestations that could not wait until a physician/ dentist was visited or fear of equipment/ instruments.

Univariate logistic regression models were developed for the two outcomes. Multivariate logistic regression models were adjusted for background variables, medical history, and having insurance after including the variables with statistical significance in univariate models. Odds ratio and 95% confidence intervals were calculated. Statistical significance was set at 5%. Analysis was done using SPSS version 20.0.

3. RESULTS

Out of 420 questionnaires distributed, 396 (94.3%) were returned. The mean (SD) age was 42 (13.2) years, with a slightly greater percentage of females (57.8%). Most subjects were married (86.1%), with mean (SD) number of children=3.4 (1.6). Only 6.6% were university-educated and 77.8% were non-smokers. They had an average perception of their general and oral health alike (mean=5.5 and 5.6). Most respondents had non-oral diseases (58.3%) and 67.9% reported having oral diseases. Only 19.1% had health insurance and 56.3% had

problems accessing health care services but were satisfied with health services when available (67.3%, Table 1).

The frequency of self-medication differed among non-oral conditions, ranging from 22% for blood pressure to 72.8% for headache and the frequency of reporting antibiotics self-medication

ranged from 5.8% in blood pressure problems to 26.3% for common cold. Respondents reported variation in self-medication for oral diseases ranging from 27.8% for tooth extraction to 45.3% for toothache, with the frequency of antibiotics self-medication ranging from 7.1% to 18.2% for the two conditions. Overall, 84.3% and 45.5% reported self-medication using any drug for

Table 1. Demographic and socioeconomic characteristics of participants

Criteria	Number (%) / Mean (SD)
Age in years	42.2 (13.2)
Males	166 (42.2)
Females	227 (57.8)
Married	340 (86.1)
Number of children	3.4 (1.6)
University- educated	26 (6.6)
Smokes	80 (22.2)
Perceived general health score (ranging from 0 to 10)	5.5 (2.5)
Perceived oral health score (ranging from 0 to 10)	5.6 (2.9)
Has non- oral diseases	231 (58.3)
Has oral diseases	269 (67.9)
Has health insurance	75 (19.1)
Has problems accessing health services	222 (56.3)
Satisfied with health care	261 (67.3)

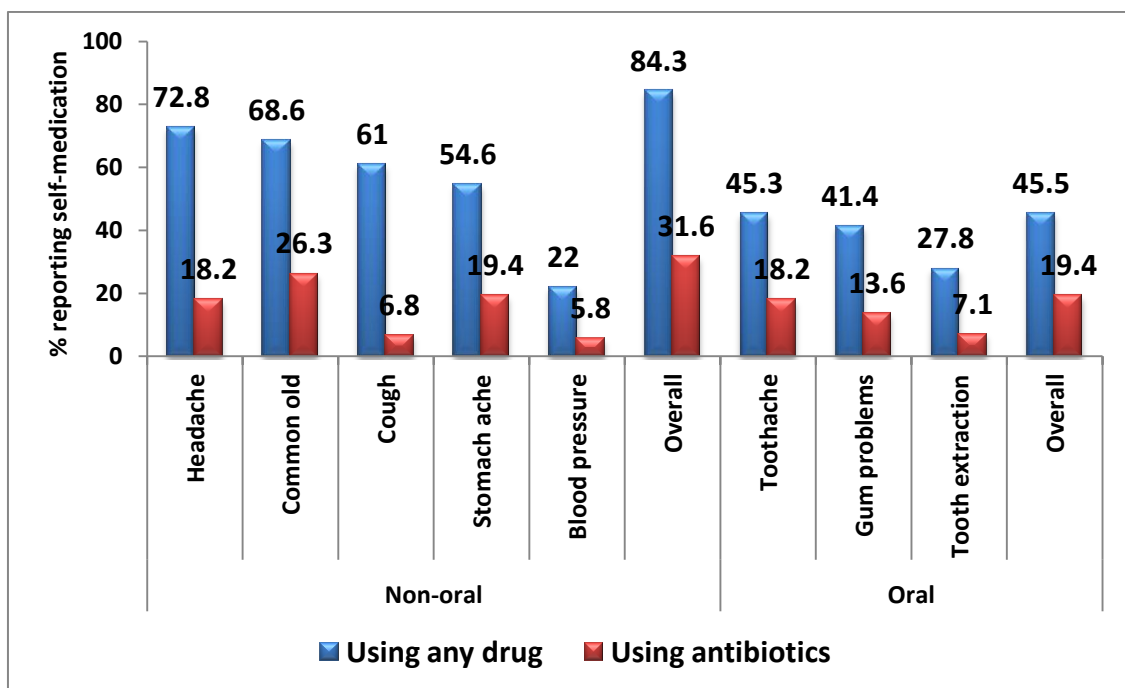


Fig. 1. Self-medication using any drug and using antibiotics in some non-oral and oral conditions among the study participants

Table 2. Factors associated with self-medication with antibiotics for common cold and toothache among study participants in multivariable analysis

Variables	N (%)	Self-medicating for common cold OR (95% C.I.)	Self-medicating for toothache OR (95% C.I.)
Difficulty finding physician/ dentist	105 (26.5)	1.97 (1.17, 3.30)*	1.43 (0.81, 2.53)
Prescribed medications not effective	106 (26.8)	1.48 (0.76, 2.89)	1.14 (0.54, 2.41)
Prescribed medications caused side effects	118 (29.8)	1.89 (0.97, 3.69)	1.75 (0.83, 3.67)
No need for professional, condition not serious	292 (73.7)	1.99 (1.01, 3.90)*	2.84 (1.22, 6.64)*
Medications already available/ left overs	180 (45.5)	1.94 (1.18, 3.17)*	1.81 (1.04, 3.13)*

*Multiple regression controlling for the effect of age, gender, marital status, number of children, education, smoking, perceived general and oral health as well as having chronic diseases, oral diseases and health insurance, OR: odds ratio, C.I. confidence interval, *: statistically significant*

non-oral and oral conditions and 31.6% and 19.4% reported antibiotics self-medication for these conditions respectively (Fig. 1). The main reason for self-medication for oral conditions was fear of equipment/ instruments (44%).

Different factors were associated with antibiotics self-medication for common cold and toothache (Table 2). In multiple regression, three factors were associated with higher odds of antibiotics self-medication for common cold; difficulty of finding a physician (OR= 1.97), perceiving the condition to be not serious enough to require a physician (OR= 1.99) and having leftover medication (OR= 1.94). Of these three factors, two were significantly associated with higher odds of antibiotics self-medication for toothache; perceiving the condition to be not serious enough to require consulting a dentist (OR= 2.84) and having leftover medications (OR= 1.81). Unavailability of dentists was significantly associated with antibiotics self-medication for toothache in univariate regression (OR= 1.75) but not in multiple regression. When antibiotics self-medication for common cold was introduced as an additional independent variable to the multiple model of using antibiotics to self-medicate for toothache, all existing variables lost statistical significance and the newly added variable had OR= 55, 95% CI= 22.59, 119.67. When that variable was replaced by antibiotics self-medication for any non-oral condition, the OR= 71.18, 95% CI= 40.75, 142.03.

4. DISCUSSION

Among participants with modest educational level, with access to health care professionals, self-medication in general and using antibiotics was prevalent. The perceptions that the condition was not serious and having leftover medications

were associated with higher odds of antibiotics self-medication. Using antibiotics to self-medicate for common cold was strongly associated with self-medication for toothache and so was self-medication for any other non-oral condition. Our findings have policy implications to limit antibiotics availability, and health education implications to increase patients' awareness regarding the risks of self-medication with antibiotics for toothaches. These conditions require other interventions to be treated and self-medication may give the patient a false sense of security, delay care seeking and aggravate the condition. The results also show that combining efforts across different healthcare sectors may be more efficient in addressing the problem since self-medication for non-oral and oral conditions were strongly associated.

The high prevalence of self-medication reported in our study agrees with systematic reviews reporting that up to 92% of adolescents took drugs without consulting physicians [18,19] and 20-60% of adults self-medicated [20]. The prevalence of antibiotics self-medication in our study, however, was lower than that reported in other Arab countries; 40% in Jordan, [21] 46% in the UAE [22] and 57% in Kalamoon, Syria [7]. Studies conducted in the same city where our study was conducted- Alexandria, Egypt- showed high prevalence of self-medication reaching 86.4% of community-based adults with 53.9% using antibiotics [11] and 81.1% of pharmacies' clients purchasing medicines based on self-medication [23].

The prevalence of self-medication for oral conditions in our study was lower than that in a community-based study in Cameroon (67.8%), where 21.2% of respondents used antibiotics for

oral problems [14]. Our estimates were similar to those of dental hospital-based studies in Nigeria (48.9% and 42%) [15,24]. The prevalence of antibiotics self-medication for oral conditions in our study (19.4%) was lower than that reported among Jordanian patients visiting dental clinics in a University teaching hospital (41%) [25].

Gender was not associated with self-medication in our study. This agrees with Agbor and Azodo who reported no association between gender and self-medication for oral health problems among Cameroonians ($P= 0.85$) [14]. It disagrees with Ocan et al who reported an association between gender and antimicrobial self-medication in developing countries [2].

In the present study, patients' perception that the problem was not serious was associated with higher odds of antibiotics' self-medication for common cold and toothache. In another study of patients seeking consultation for upper respiratory tract infection in Singapore, subjects who believed that infection resolved on its own were 2.07 times more likely to self-medicate and were less likely ($OR= 0.51$) to be dependent on prescribed medication [26]. Ocan et al. concluded that patients who considered their illness mild or moderate were less likely to consult a health care professional [2].

In our study, availability of leftover drugs was associated with higher odds of self-medication. Patients may save antibiotics for future use if they are sold in fixed packages thus promoting self-medication. This likelihood decreases if the medication is dispensed in exact doses [21, 27,28]. A study found that the risk of antibiotics self-medication was lower among Portuguese adults who reported it was not easy to get antibiotics without prescription than those who had no difficulty ($OR= 0.07$) [29]. This emphasizes the need for policies regulating medication dispensing and selling of over the counter drugs [4,30,31]. It is also important to restrict the prescription of antibiotics by health care professionals to situations requiring their use based on evidence-based clinical practice guidelines.

The participants in our study reported fear of dental equipment as the major reason for self-medication for oral diseases. Similarly, a Nigerian study showed that 31% of respondents cited fear of dental equipment as a major cause for oral self-medication [24].

This cross-sectional study showed association but does not prove causality. For example, the association between self-medication and using leftover drugs may indicate that the availability of medications encouraged self-medication with the outcome variable being self-medication. Alternatively, self-medication may be associated with regular purchase of antibiotics in amounts that exceed the patient's need so they accumulate as leftovers. In this latter case, the outcome variable is drugs availability. Another limitation of the study is relying on self-reporting to assess self-medication. This may introduce some recall bias.

5. CONCLUSIONS

Our findings add to existing knowledge of self-medication in a country with relatively adequate physician/ dentist to population ratio and in patients with access to care almost free of charge. The two reasons associated with self-medication were perceiving the condition as not serious and having left over medication. Self-medication for oral and non-oral conditions were associated and therefore the practice seems to be related to the individual rather than a response to health problems. Although the prevalence of self-medication for oral conditions was much lower than for non-oral conditions, the complexity of the problem increases since the patient would be self-medicating for multiple purposes with added health risks. Health education to improve awareness and policy modification to limit the availability of antibiotics are needed to address this issue.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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