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ABSTRACT This study aimed to describe the prevalence, pattern and reasons for self-medication among adults in Alexandria, Egypt. In a community-based survey during 2012, a representative sample of 1100 adults completed a predesigned interview questionnaire on self-medication practices by drugs and complementary or alternative medicines (CAM). A majority of them practised self-medication (86.4%), mostly using both drugs and CAM (77.5%). The most commonly used drugs were analgesics (96.7%), and cough and cold preparations (81.9%), but 53.9% of respondents reported self-medication with antibiotics. The most frequently used CAM were herbs (91.6%), followed by spiritual healing (9.4%) and cupping and acupuncture (6.4%). CAM improved the condition according to 95.2% of users. Logistic

regression analysis revealed that age, occupation and the presence of chronic conditions were the independent factors significantly affecting the practice of self-medication with drugs.

Automédication avec recours aux médicaments conventionnels, complémentaires et alternatifs à Alexandrie (Égypte) : prévalence, tendances et déterminants

RÉSUMÉ La présente étude avait pour objectif de décrire la prévalence, les tendances ainsi que les motifs de l'automédication chez des adultes à Alexandrie (Égypte). Dans une enquête communautaire en 2012, un échantillon représentatif de 1100 adultes a répondu à un questionnaire prédéfini au cours d'un entretien sur leurs pratiques d'automédication à base de médicaments conventionnels, complémentaires et alternatifs. Une majorité d'entre eux pratiquait l'automédication (86,4 %), et la plupart consommait à la fois des médicaments conventionnels et des médicaments complémentaires et alternatifs (77,5 %). Les médicaments conventionnels les plus utilisés étaient les analgésiques (96,7 %), et les préparations contre la toux et le rhume (81,9 %), tandis que 53,9 % des répondants indiquaient consommer des antibiotiques en automédication. Dans la catégorie de la médecine complémentaire et alternative, le recours aux médicaments à base de plantes (91,6 %) arrivait en tête, suivi par les soins spirituels (9,4 %), l'application de ventouses et l'acupuncture (6,4 %). La consommation de médicaments complémentaires et alternatifs permet d'améliorer l'état de santé selon 95,2 % des utilisateurs. L'analyse de régression logistique a révélé que l'âge, l'emploi occupé et la présence de maladies chroniques étaient les facteurs indépendants qui influaient significativement sur la pratique de l'automédication à base de médicaments conventionnels.

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Introduction

Self-medication is the use of non-prescribed drugs to treat self-diagnosed disorders or symptoms. This can include the use of over-the-counter (OTC) drugs available without a physician's prescription through pharmacies (1,2), the irregular use of a prescribed drug, typically in chronic or intermittent diseases, or the use of leftover drugs from previous prescriptions. It also includes the use of a wide range of complementary and alternative

medicine (CAM) such as herbal medicines (herbs or herbal preparations), nutritional supplements, traditional products, and home remedies (3,4).

People all over the world suffer common health problems (e.g. colds, headaches, digestive problems and muscle aches) in roughly the same frequency and respond in the same way to these problems. In 50% of the cases, they let the condition run its course or use a home remedy. In 25% of cases, they use non-prescription/OTC medications and the remaining 25% of cases visit a physician or use a prescription medicine previously obtained for the same condition. Surveys show that OTC medications are seen by many people as being as effective as prescription medications (5). The reasons for using self-medication are poorly understood. Most studies point to loose regulations about medication, and inadequate access to health care, as the main reasons (6).

In many developing countries, thousands of different prescription-only drugs are sold OTC. Many of these are drugs which potentially serious side-effects and need to be used with care (4). The potential risks of self-medication include using inappropriate drugs or inaccurate dosages, which may result in adverse reactions. It may temporarily mask symptoms and delay patients from seeking medical advice, which could result in serious complications (6). Self-medication with antibiotics has the serious potential for development of drug-resistant microorganisms and hence future treatment failure (7). Irrational use of analgesics may lead to adverse events including a variety of gastrointestinal complications, adverse effects on kidney function, risk of cardiovascular events and hepatic injury (8).

A limited number of drug utilization studies have been conducted in Egypt. In Alexandria, a phamaco-epidemiological study of self-medication among adults attending pharmacies reported that nearly 81% of medications were purchased without prescription (9). Another study carried out among Ain Shams University medical students in Cairo, Egypt, showed that the prevalence of self-medication among the studied population was 55% (10).

The aim of the present study was to estimate the prevalence of self-medication with drugs and complementary/alternative medicines among adults in Alexandria, Egypt; to describe the patterns of medication use; and to identify reasons for self-medication. It was hoped that the results would guide decision-makers to take action to address self-medication and limit its potential effects.

Methods

Sampling

A community-based survey was carried out during the second half of 2012 among adults living in Alexandria, Egypt. A multistage, cluster sampling technique was used to select a representative sample of adults from all health districts of Alexandria (8 districts), taking into consideration the estimated population size of these districts for the year 2010 (11).

The sample size was calculated using Epi Info version 6. Based on an expected self-medication prevalence of 40% (12), confidence limit of 4% and design effect of 2, the minimum required sample size at 95% confidence level was found to be 1050. Thirty clusters from different districts of Alexandria were selected using probability proportionate to size. Each cluster was composed of at least 38 families. The total sample amounted to 1140 families. From each family, the adult present at the time of data collection was interviewed by a well-trained interviewer. It was possible to collect detailed information from 1100 of these adults (96.5% response rate).

Data collection

A predesigned interview questionnaire was used to collect information on self-medication practices. The questionnaire consisted of 4 sections. The first section included the sociodemographic characteristics of the interviewees such as age, sex, level of education and occupation. It also included the medical history of the interviewees (e.g. chronic diseases, their types, whether they had health insurance or other health services near their residence and their utilization of these services). The second section of the questionnaire included questions about practising self-medication. It also included questions about whether self-medication was their first choice when feeling ill, types of self-medication (drugs, CAM or both) and its pattern. The third section was about self-medication with drugs. It included questions about the symptoms warranting self-medication, the drugs frequently used for self-medication, the reasons for self-medication with these drugs and whether the symptoms improved. The fourth section concerned self-medication with CAM and included questions about the types used, the symptoms or illnesses for which they were used, the reasons for preferring them over modern medicine and whether the condition for which they were used improved.

A pilot study was carried out to assess the understanding of different questions, to estimate the average time needed for filling the questionnaire and to find out any difficulties that might arise during data collection.

The study was approved by the ethics committee of the High Institute of Public Health. An informed consent was obtained from the interviewed adults. The purpose of the research and its benefits were explained to the participants. Anonymity and confidentiality were guaranteed and maintained. The researchers complied with the international ethical guidelines for research.

Statistical analysis

The data were sorted, coded and analysed using SPSS for Windows, version 16.0. Quantitative data were described in terms of mean and standard deviation (SD), whereas percentages were used to describe categorical data. Pearson chi-squared test was used for analysis of categorical data and Student t-test for quantitative data. Multiple logistic regression analysis was used to estimate the strength of the association between the exposure and a binary outcome. The dependent factors were the practice of self-medication in general, self-medication with drugs and self-medication with CAM, and the independent factors were age, occupation and the presence of chronic conditions or diseases. All statistical analyses were carried out using 2-tailed tests, and a P-value

Results

Respondents' demographic and clinical characteristics

The age of the participants ranged between 18 and 85 years with a median age of 43 years and a mean of 44.1 (SD 12.2) years. More than half (54.4%) of the studied adults were females. Regarding education, 7.2% were illiterate, 15.5% could just read and write or had primary education, 11.3% had completed preparatory education, 43.1% secondary education (regular or technical) and 22.9% university or higher levels of education.

Table 1 shows that 44.4% of the participants reported having chronic conditions or diseases. Cardiovascular diseases were the most commonly reported conditions, followed by diabetes mellitus and chronic respiratory diseases. Less than half of the participants (47.8%) reported being covered by health insurance services and most of them (71.3%) utilized these services regularly. All participants reported having health services (a health centre, a physician or a pharmacy) within easy reach of their residence and almost all of them (98.9%) reported that they utilized these services in case of illness.

Practice of self-medication

Table 2 shows that 950 of the respondents (86.4%) practised some form of self-medication. In the case of acute illness, self-medication was the first choice of about one-third of them (34.5%). A majority of those practising self-medication (77.5%) reported using both drugs and CAM, although some respondents used only drugs (18.1%) or only CAM (4.4%).

Self-medication with drugs

Types of drugs used

Of those practising self-medication 908 (95.6%) used drugs (either drugs only or both drugs and CAM). The top 10 drugs involved in self-medication are illustrated in Figure 1 . They included analgesics (96.7%), cough and common cold preparations (81.9%) and vitamins and minerals

(63.2%). More than half of participants reported self-medication with antibiotics (53.9%) and with drugs for gastrointestinal disturbances (51.4%). Antihypertensives were used in self-medication by 16.1% of participants. Other less frequently used drugs included antihistamines, cortisone preparations and drugs for migraine and for diabetes.

Symptoms that warranted self-medication with drugs

Regarding symptoms that warranted self-medication with drugs, Table 3 shows that gastrointestinal conditions (constipation, colic, diarrhoea, vomiting and heartburn) headed the list. Headache, body aches, common cold and cough were also very common symptoms for which self-medication was practised. Fever and exacerbation of a chronic illness were mentioned by 15.9% and 5.1% respectively.

Reasons for self-medication with drugs

Among those who practised self-medication with drugs, it appears from Table 3 that almost all of them used these only for minor health problems. The most common reasons for practising self-medication with drugs as reported by the study participants included emergency use especially when symptoms started at odd hours (50.0%) and not being able to get medical advice (for financial or time reasons). Having an old prescription for the same symptoms was mentioned by 46.4%. Less frequently mentioned reasons included previous good experience with the drug.

Sources of advice/information about self-medication with drugs

The table also shows that the source of advice or information about self-medication with drugs was an old prescription for three-quarters of participants, pharmacists for less than half of the participants and themselves for about one-fifth of the participants. Self-medication was linked to the availability of drugs at home on a regular basis and by keeping leftover drugs (78.9% and 84.1% respectively).

Self-medication with CAM

Types of CAM used

A total of 778 (81.9%) of those practising self-medication used CAM (either CAM only or both CAM and drugs). All of them reported using CAM during the previous year. Herbs were the most commonly used type of CAM; other much less commonly used CAM included spiritual healing, cupping (hijamah), acupuncture and cauterization (Table 4). It can be noted that 2.6% mentioned using mythic healing practices from traditional Egyptian culture. Regular types of herbs were the form of herbs most commonly used in self-medication with CAM (81.7%), followed by specially prepared combinations of herbs.

Symptoms that warranted self-medication with CAM

Gastrointestinal problems (constipation, colic, diarrhoea, vomiting and heartburn) were the most common complaints leading to self-medication with CAM (88.7%), followed by common cold and cough (82.3%) then headache and body aches (49.4%). Self-medication with CAM was not restricted to dealing with acute health problems but was reported in the case of chronic noncommunicable diseases, fever, infertility, sexual problems and skin problems, but at much lower percentages.

Reasons for CAM use

More than half the participants (54.4%) preferred CAM because they felt that modern drugs had side-effects (Table 4). One-third of participants (33.3%) preferred them because they had previous good experience with CAM. A sizeable proportion mentioned that CAM is much stronger than other methods of treatment (16.1%). Other reasons for preferring CAM included religious reasons and saving money. The vast majority of the participants (95.2%) reported that self-medication with CAM had improved their condition.

Factors associated with self-medication

The relationship between the sociodemographic characteristics and the practice of self-medication in general is shown on Table 5 . The mean age of those who practiced self-medication was significantly higher than those who did not practice it [45.39 (SD 12.05) versus 36.27 (SD 9.74) years respectively] (t = 10.30, P

It can be noted from Table 5 that participants who were illiterate, could just read and write and those who had finished only primary education were significantly more likely to practise self-medication than those with higher levels of education ($\chi 24 = 14.66$, P = 0.005). The table also shows that most adults who were retired, farmers, skilled workers and all studied students practised self-medication, while housewives were the group least likely to practice self-medication. The relation between occupation and practising self-medication was statistically significant ($\chi 29 = 37.75$, P

Significantly more adults who suffered from chronic conditions practised self-medication than did those who did not have chronic conditions ($\chi 2 = 67.76$, P **Logistic regression analyses**

Table 6 shows the logistic regression analyses for the independent factors associated with 3 different dependant variables, namely practising self-medication in general, self-medication with drugs and self-medication with CAM.

Three independent factors were found to significant affecting the practice of self-medication in general: age (OR 3.96; 95% CI: 1.69–9.26), occupation (OR 1.80; 95% CI: 1.22–2.66) and presence of chronic conditions or diseases (OR 2.98; 95% CI: 1.59–5.59). Model 1 correctly classified 86.4% of cases. These 3 factors were also found to significantly affect the practice of self-medication with drugs. Model 2 correctly classified 82.5% of cases. Finally, age (OR 2.69; 95% CI: 1.61–4.51) and the presence of chronic conditions or diseases (OR 1.95; 95% CI: 1.35–2.83) were the only risk factors significantly associated with the practice of self-medication with CAM. Model 3 correctly classified 70.7% of cases.

Discussion

Self-medication is widely used all over the world, mainly in response to certain common minor health problems. Although the practice of self-medication has potential risks—of masking a serious illness, of delaying seeking medical advice or of adverse reactions (8)—it has some positive aspects, including better use of physicians' time and skills and reducing the overall burden on the health-care services (13).

Improving the public's use of self-medication requires knowledge about its magnitude, types and factors affecting utilization. Several studies on self-medication have described the pattern of utilization in both developed and developing countries (5,14). In Egypt, the utilization of specific drugs, notably antibiotics and analgesics, has been studied (12). In the present study the pattern and use of both drugs and CAM were studied in a large population in Alexandria. It was noted that self-medication in Alexandria is very common. Seven out of every eight adults included in this study admitted that they had practised self-medication at least once during the previous year.

Although 4.4% of the studied population mentioned having a chronic health problem/disease, it appears that self-medication was not so much used for chronic health conditions as for acute minor common conditions, such as gastrointestinal problems (colic, constipation, diarrhoea and dyspepsia), headache and body aches, flu/common cold/cough and to some extent fevers. In a previous multicentre study on self-medication and self-prescription in 6 Latin American countries, self-medication was used for roughly the same conditions but with a different order of frequency, which is probably due to differences in the prevalence of various diseases (14). In our study gastrointestinal problems were more common than those countries (14).

The main source of advice and information on self-medication for our adults in Alexandria was a previous medical recommendation in the form of an old prescription. The second most common source was pharmacists, presumably as they can help in assessing symptoms and explaining how to use the medication and as they do not request a prescription or charge for their advice.

An older person in the household, friends or neighbours were the third main source of information. This may be a reflection of the belief in the value of other people's experiences and the views of elderly people, especially as accessibility to medical advice is not that easy for many Egyptians. The media (television, radio, newspapers) were mentioned as a source of information by only 5.4% of the studied population. A worldwide review of consumer surveys reported a similar profile of sources (5).

The most frequently consumed drugs for self-medication in the current study were analgesics. Headache and body aches were among the commonest symptoms that warranted self-medication using analgesics. These findings were in accordance with studies from other parts of the world (14–16). Several studies in different countries also reported that analgesics were the most common drugs used for self-medication (17–19). This is explained by the fact that globally 20% of adults suffer from one or more type of pain and it is estimated that another 10% of adults are diagnosed with chronic pain each year (17). After analgesics, cough and cold preparations, vitamins and calcium, antibiotics and gastrointestinal drugs were commonly used. More than 50% of our respondents mentioned the use of these drugs. Less frequently reported drugs used in self-medication included antihypertensives, antihistamines and drugs for diabetes. More than half of the studied population reported that they had no health insurance of any kind and this could partially explain this diversity of drugs used for self-medication.

It is concerning that self-medication with antibiotics was mentioned by more than half the studied adults (53.9%). Previous studies in several countries reported that self-medication with antibiotics was common. The utilization rates, however, vary considerably from less than 10% in Western and Northern Europe to more than 50% in eastern and southern Europe and the Mediterranean and Arab countries (20–23). In this study and in another study on self-medication with antimicrobial drugs in Europe (24), it was found that self-medication with antibiotics was aided by the presence of leftover antibiotics from a previous prescription, due to dispensing extra doses or because of non-compliance or intentional saving of the antibiotics for future use. Another main facilitating factor is the opportunity to acquire antibiotics from pharmacies without a prescription in Egypt. Antimicrobial drug self-medication is a cause of concern because it may contribute to the spread of antimicrobial drug resistance and so is the most harmful inappropriate use of self-medication.

Nearly 82% of the participants in this study reported using CAM during the previous year and herbs were the most frequently used type. This high figure could be explained by several factors. First, CAMs are traditionally used in Egyptian society and are less expensive than pharmaceuticals which may make them preferable for the poorer sectors of society. Also, more than half of the respondents reported that one of the reasons for using CAM was the side-effects of modern medication and almost all of them believed that self-medication with CAM improved their condition. Despite the methodological differences between studies on CAM

use by the general population in a number of countries, it is clear that a substantial proportion of adults worldwide use CAM. The reported rates of use during the previous 12 months vary from as high as 75% in Japan and South Korea to 38% in United States, 30% in Italy and 26% in the United Kingdom (25).

The present study showed that herbs were the most frequently used type of CAM. This finding contrasts with the reports of other studies, in which home remedies (26) and spiritual healing (27,28) were the most common types of CAM used. This difference could be attributed to the difference in the target population and their culture and traditions in different places.

Our regression analysis of demographic and clinical variables revealed that the presence of chronic conditions or diseases were significantly associated with the practice of self-medication with CAM. This might be explained by the fact that the patients with chronic conditions believed in the effectiveness of CAM in treating their health problems. A population-based survey among Canadians revealed similar results, whereby individuals with chronic conditions were more likely to utilize CAM because they felt that conventional treatments were not effective in treating their health problem (29). Another Canadian study examining why patients chose to use CAM found that 40.1% had problems communicating with their physician and approximately two-thirds of respondents reported that conventional medicine was not effective for treating their health condition and that they were desperate and were therefore willing to try anything (30).

Conclusions

The findings of the study indicate that a large proportion of adults in Alexandria use drugs and CAM for self-medication. The current work highlights the need for education of the public regarding the potential risks of self-medication. Cooperation of the health authorities and mass media is needed in this matter. Periodic surveys are recommended to monitor changing patterns of self-medication.

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