



Prevalence and Cause of Self-Medication in Iran: A Systematic Review and Meta-Analysis Article

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Abstract

Background: Nowadays self-medication is one of the most common public health issues in many countries, as well as in Iran. According to need to epidemiological information about self-medication, the aim of this study was to systematic review and meta-analysis of prevalence and cause of self-medication in community setting of Iran.

Methods: Required data were collected searching following key words: medication, self-medication, over-the-counter, non-prescription, prevalence, epidemiology, etiology, occurrence and Iran in Google Scholar, PubMed, Scopus, Magiran, SID and IranMedex (from 2000 to 2015). To estimate the overall self-medication prevalence, computer software CMA: 2 applied. In order to report the results, forest plot was employed.

Results: Out of 1256 articles, 25 articles entered to study. The overall prevalence of self-medication based on the random effect model was estimated to be 53% (95% CI, lowest= 42%, highest=67%). The prevalence of self-medication in students was 67% (95% CI, lowest=55%, highest=81%), in the household 36% (95% CI, lowest=17%, highest=77%) and in the elderly people 68% (95% CI, lowest=54%, highest=84%). The most important cause of self-medication was mild symptoms of disease. The most important group of disease in which patients self-medicated was respiratory diseases and the most important group of medication was analgesics.

Conclusion: The results show a relatively higher prevalence of self-medication among the Iranian community setting as compared to other countries. Raising public awareness, culture building and control of physicians and pharmacies' performance can have beneficial effects in reduce of prevalence of self-medication.

Keywords: Self-medication, Prevalence, Cause, Community setting, Iran

Introduction

Nowadays, the indiscriminate use of drugs, self-medication is among the greatest health, social and economic issues of different societies, includes Iran (1). Self-medication is a behavior in

which the individual attempts to solve his/her health problem without professional opinion or help (2). The irrational and self-driven use of drugs can lead to various side effects (3, 4).

Among the most significant of these are microbial resistances, non-response to treatment, and toxications. Moreover, self-medication disrupts the drug market, wastes costs and increases per capita drug financing in the society (5-7).

The prevalence of self-medication varies from 12% to 90% in Iran (8-12). Moreover, each Iranian uses 339 drugs annually, a figure that exceeds the global standard. Analgesics, eye drops, and antibiotics hold the greatest share in self-medicated drugs (10, 13, 14). According to a report released by the Ministry of Health's 'Adverse Drug Reactions' (ADR) Center 10000 adverse drug reactions have been registered in the past 10 years, among which 30% belonged to injectable drugs (15).

The following factors affect the prevalence rate of self-medication among people: costly physician fees, transportation issues, insurance problems, easy access to drugs, feeling of well-being, not taking the disease seriously, previous prescription of the drug, unawareness, cultural and socio-economic issues, etc. (16-20).

Taking into account the high prevalence of self-medication in Iran and its adverse effects health officials and stakeholder organizations need to consider seriously reducing and preventing this phenomenon. To do this, they need accurate and valid information on the prevalence and etiology of self-treatment in the society. Hence, this study, which is a systematic review & meta-analysis, was conducted to provide health system managers, officials, and policy makers with useful and applicable data.

Methods

This systematic review and meta-analysis study was conducted in 2015, using the approach adopted in the book "*A Systematic Review to Support Evidence-Based Medicine* (21)". Moreover, it was performed according to the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) statement (22, 23).

The inclusion criteria for the study were cross-sectional community-based studies on the prevalence and causes of self-medication, studies conducted in Iran, articles published in Persian and

English in Iran, articles published from 2000 to 2015.

Exclusion criteria included studies conducted in healthcare centers, conference presentations, case reports, interventional and qualitative studies.

Required data were collected by searching the following keywords: medication, self-medication, over-the-counter, non-prescription, prevalence, epidemiology, etiology, occurrence and Iran. The following databases were used: Google Scholar, PubMed, Scopus, Magiran, Scientific Information Database (SID) and Iranmedex. Some of the relevant journals and websites were searched manually. The reference lists of the selected articles were also checked. In the final stage of the literature review, we searched the gray literature and consulted experts. There was no time limitation for our study search.

In the first phase of the review process, an extraction table was designed that included the following items: first author's name, year of publication, city, sample and sample size, self-medication prevalence percent (in both males and females), Drug Group, determinant factors, cause of self-medication and type of request for the drug. The validity of the data extraction table was confirmed by experts. A pilot study (with 5 articles) was conducted for further improvement of the extraction table. Two authors (M.M and N.M) who had sufficient experience and knowledge were responsible for independently extracting the data.

In the first phase of article selection, articles with non-relevant titles were excluded. In the second phase, the abstracts and full texts of articles were reviewed to include those articles that matched the inclusion criteria. Reference management (Endnote X5-Thomson Reuters, Philadelphia, PA 19130,

USA) software was used to organize and assess the titles and abstracts, as well as to identify duplicate studies. Microsoft office Excel 2010 was used to draw graphs.

Two reviewers (M.M and N.M) evaluated the articles based on the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) checklist (24-26). Cases in which a consensus had

not been reached between these two reviewers were referred to a third author (A.A.S).

To estimate the overall self-medication prevalence, computer software CMA 2 (Comprehensive Meta-Analysis) (Englewood, NJ, USA) was used. Forest plot was employed to report the results. In the latter, the size of each square shows the sample size and the lines on each side of the square show the confidence interval. Self-medication prevalence was calculated based on the random effect

model, with 95% confidence interval. Funnel plot was applied to evaluate the possibility of publication bias.

Results

In this study, out of 1256 articles, finally 25 articles completely related to the study objects were included (1, 27-39, 9, 40-46, 12, 47) (Fig. 1).

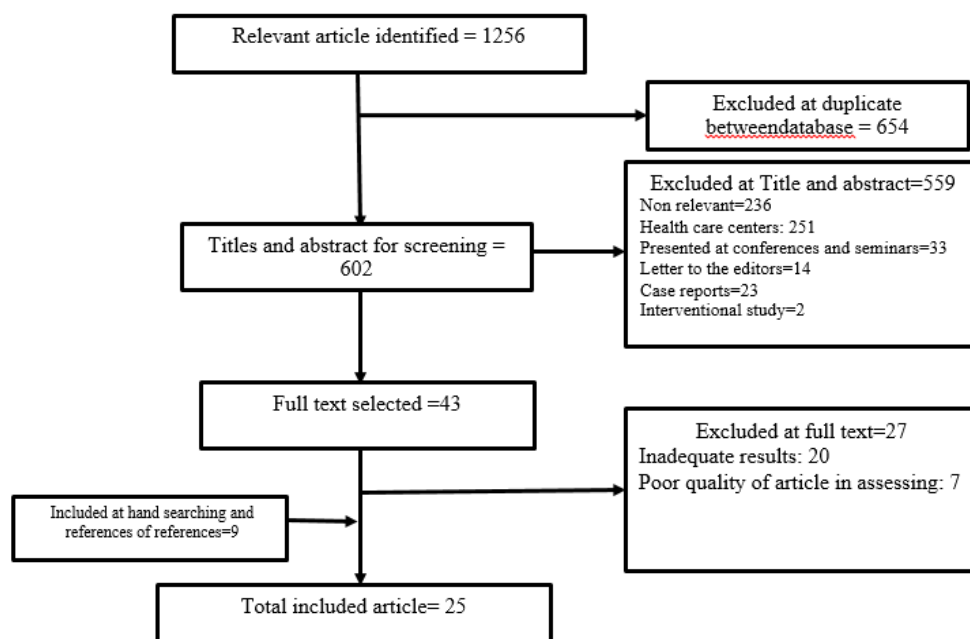


Fig. 1: Bibliographical searches and inclusion process

In 25 articles, which reviewed, 15222 individuals had gone under study. Most studies had been conducted in the city of Tehran. The highest and lowest prevalence were observed in Kerman Province among students, and among teachers in Babol, respectively. Among the most important determinant factors of self-medication were age, sex, education, financial status, place of residence, marital status and type of university (medical vs. non-medical). The overall prevalence of self-medication in community setting of Iran is shown in Fig. 2.

The overall prevalence of self-medication in community setting of Iran based on the random effect model was determined to be 53% (95% CI,

lowest = 42%, highest = 67%). 95% CI for the prevalence was drawn for each study in the horizontal line format ($Q = 363.8$ $df = 24$, $P < 0.001$ $I^2 = 93.4$).

The prevalence of self-medication among students in community setting of Iran is shown in Fig. 3.

The prevalence of self-medication among students in community setting of Iran based on the random effect model was determined to be 67% (95% CI, lowest = 55%, highest = 81%). 95% CI for the prevalence was drawn for each study in the horizontal line format ($Q = 63.9$ $df = 12$ $P < 0.001$ $I^2 = 81.2$). The prevalence of self-medication among household in community setting of Iran is shown in Fig. 4.

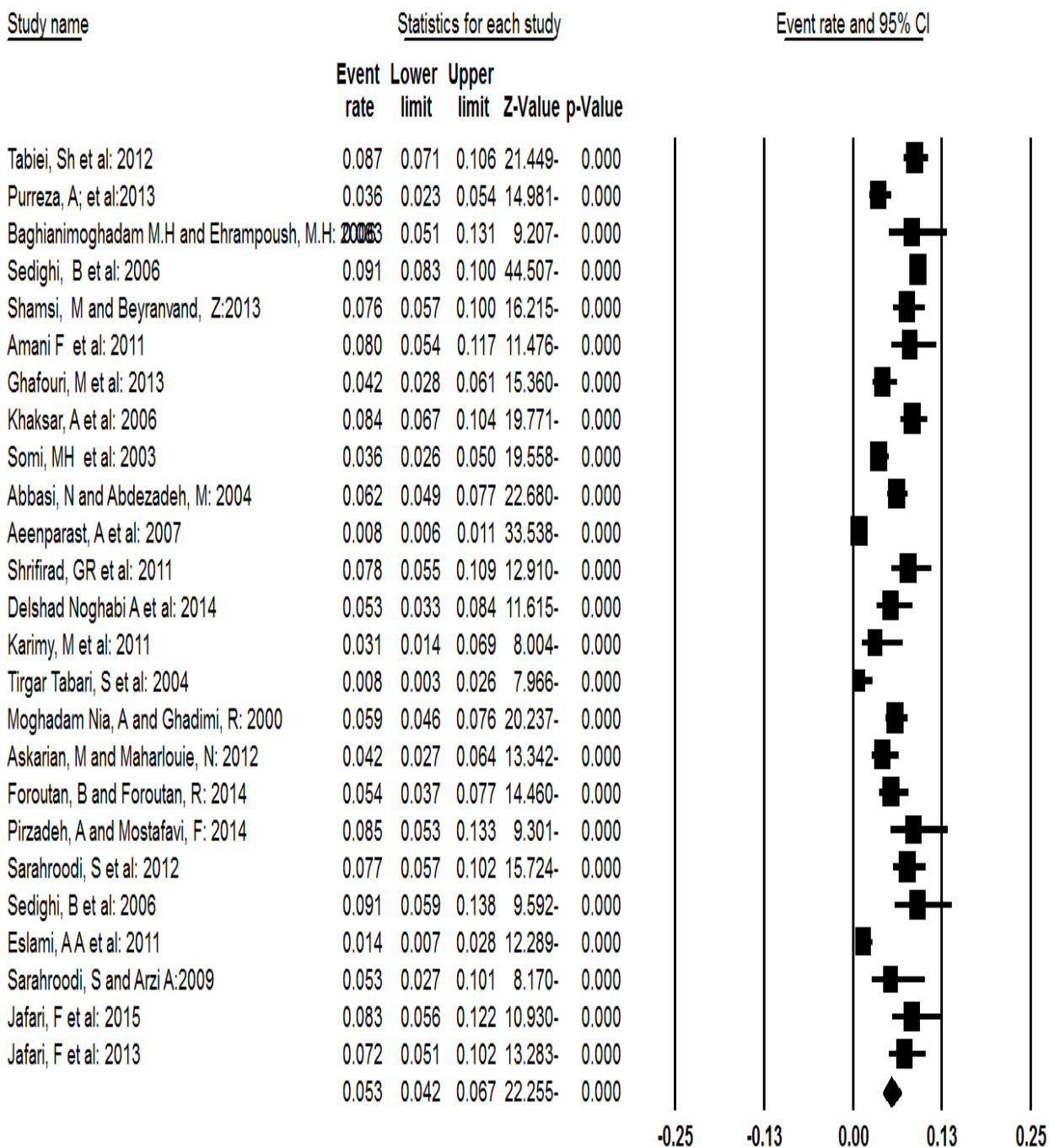


Fig. 2: The overall prevalence of self-medication in community setting of Iran

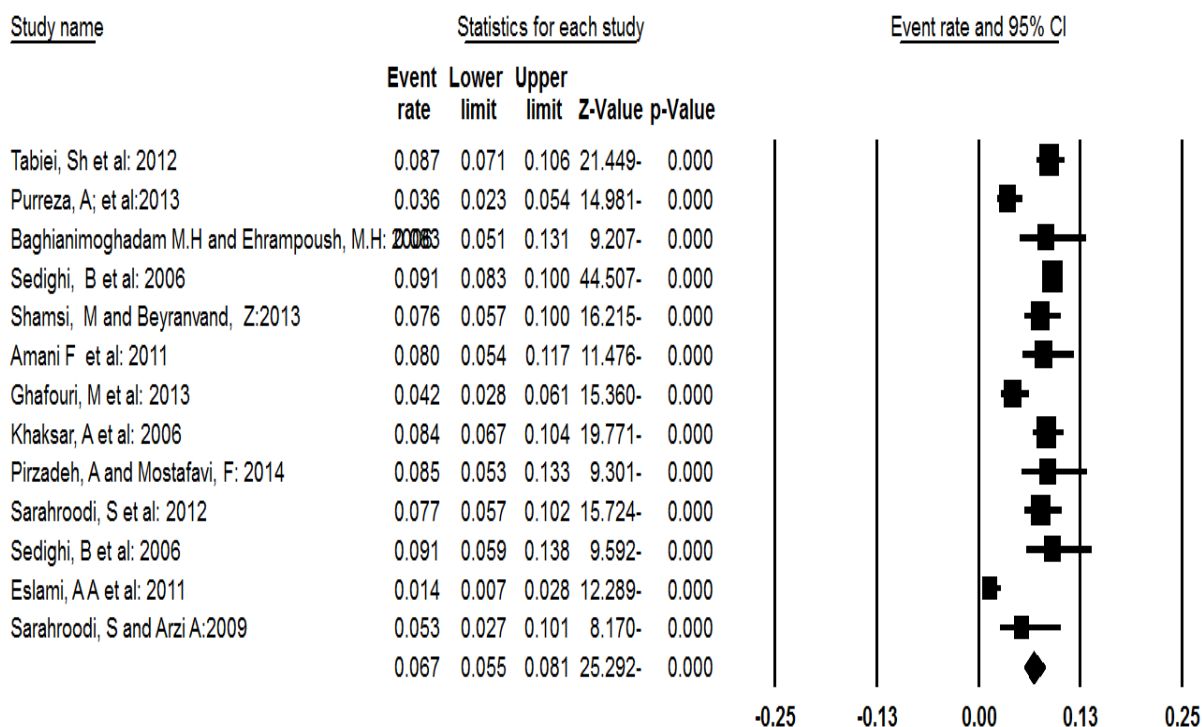


Fig. 3: The prevalence of self-medication among students in community setting of Iran

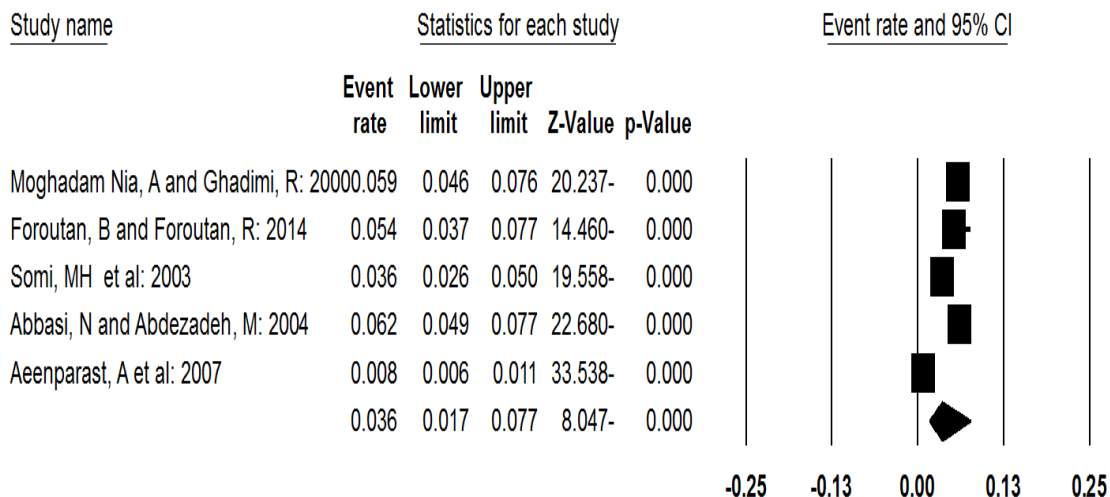


Fig. 4: The prevalence of self-medication among household in community setting of Iran

The prevalence of self-medication among household in community setting of Iran based on the random effect model was determined to be 36% (95% CI, lowest = 17%, highest = 77%). 95% CI for the prevalence was drawn for each study in the

horizontal line format ($Q = 150.8$ $df = 4$ $P < 0.001$ $I^2 = 97.3$).

The prevalence of self-medication among elderly people in community setting of Iran is shown in Fig. 5.

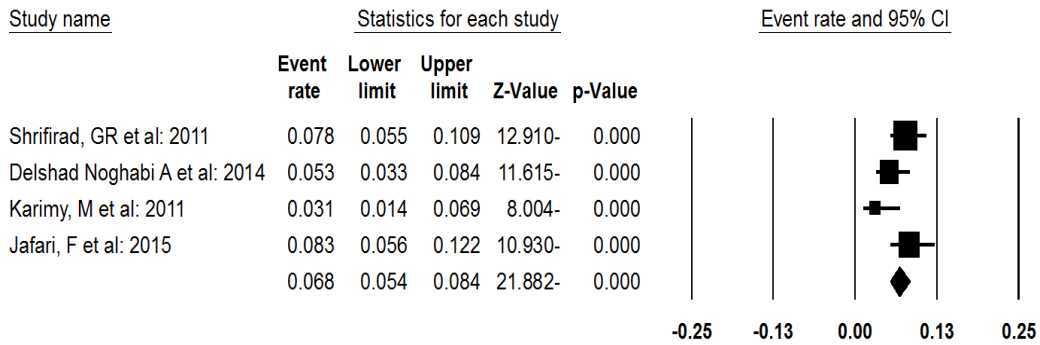


Fig. 5: The prevalence of self-medication among elderly people in community setting of Iran

The prevalence of self-medication among elderly people in community setting of Iran based on the fixed effect model was determined to be 68% (95% CI, lowest = 54%, highest = 84%). 95% CI for the prevalence was drawn for each study in the horizontal line format ($Q = 6.2$ $df = 3$ $P < 0.09$ $I^2 = 52.2$).

To evaluate the publication bias, funnel plot was applied (Fig. 6). Result of this funnel plot show there was possibility publication bias among studies.

The most common causes of self-medication are shown in Fig. 7. As shown in Fig. 7, the most important self-medication determinant factors were: mild symptoms of disease, self-diagnosis of disease symptoms, previous use of medication, and ease of access to non-prescribed medication.

The most common groups of diseases, which patients' self-medicated, are shown in Fig. 8.

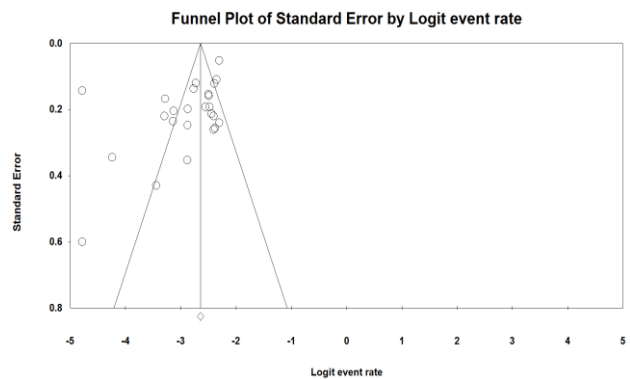


Fig. 6: Funnel plot of standard error by event rate

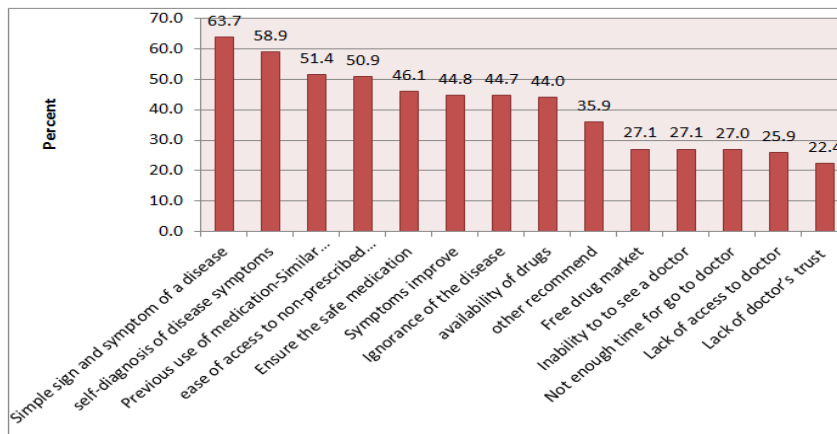


Fig. 7: The most common causes of self-medication in community setting of Iran

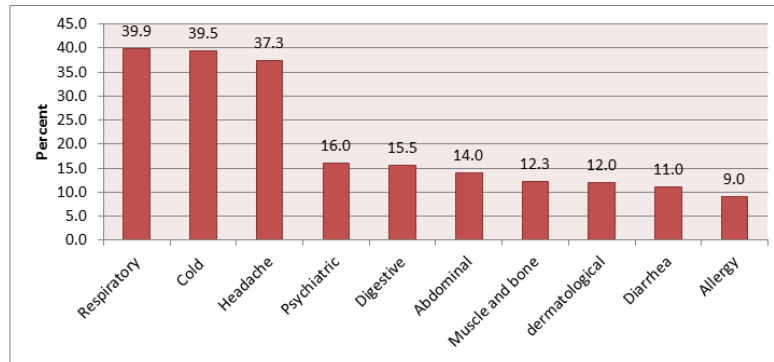


Fig. 8: The most common self-medicated groups of diseases in community setting of Iran

As seen in Fig. 8, the most important groups of diseases in which patients self-medicated were respiratory diseases, common cold and headache. The most common groups of medication, which

patients self-medicated, are shown in Fig. 9. According to Fig. 9, the most important groups of medication that were self-prescribed were analgesics, antibiotics, and cold medications.

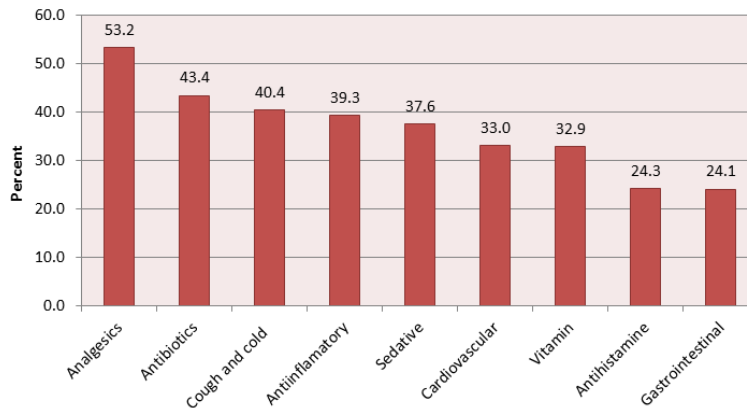


Fig. 9: The most common self-medicated groups of medication in community setting of Iran

Discussion

The overall prevalence of self-medication in Iran was 53%. The most important determinant factors of self-medication were mild symptoms of disease, self-diagnosis of disease symptoms, previous use of medication, and ease of access to non-prescribed medication. The most important groups of diseases in which patients self-medicated were respiratory diseases, common cold and headache. The most important groups of medication that were self-prescribed were analgesics, antibiotics, and cold medications.

Based on our results, the overall prevalence of self-medication in Iran was 53%. This percentage exceeds that of other studies performed elsewhere: Brazil (2010) 29.9% (48), China (2011) 32.9% (49), Portugal (2014) 18.9% (50), Germany (2004) 13.8% (51), India (2014) 11.9% (4), and Nigeria (2011) 19.2% (52). Most other studies too have reported lower prevalence of self-medication than the one in Iran (53-57). The side effects of drugs are becoming more and more evident and people are getting more used to self-medication as the years pass by. Hence, medical universities and stakeholder organizations should try to reduce the rate of self-medication through proper planning, and

prevent its harmful outcomes through the following measures: directing physicians toward the employment of non-medication treatment techniques, universal health insurance, reduction of treatment expenditures, creation of facilities for simple and inexpensive access to physicians, appropriate notification through mass media-Television & Radio-news agencies- publications and medical universities, raising public awareness of self-medication, limiting the sales of drugs without prescriptions, supervising pharmacies' performance and other similar measures.

The prevalence of self-medication was higher among students (67%) than its mean public rate. This figure has been reported at a lower level in most studies conducted in other countries (58-62). However, some studies have reported the self-medication prevalences at rates higher than ours (2, 63-67). It seems that self-medication is more prevalent among students than it is among the public. Perhaps, their higher level of information—as compared to that of the public—can be one of the reasons behind this phenomenon. These individuals have access to greater information and self-medicate based on their incomplete data, an act that can be followed by detrimental effects. This phenomenon is probably higher among medical students than it is among students of other disciplines, reason being, the nature of their curricula and their high information in the fields of drugs and diseases. In any case, appropriate planning and intervention need to be carried out in this field; culture building among students and increasing their awareness on the effects of self-medication can prove beneficial.

Self-medication was also higher among the elderly (68%) than in the other community groups. Similar to the proportion observed in other groups in Iran, the prevalence of self-medication was higher among the Iranian elderly than among the elderly in other societies (68-70). The prevalence of self-medication among the elderly in the world is 38% (71). The high rate in Iran may be attributed to the low level of awareness among the elderly. A study showed an inverse relationship between self-medication and level of awareness among the elderly (37). Hence, health officials should raise

awareness among this group. Upon entering the aging phase, treatment costs and medication use rise. Moreover, chronic diseases that predominantly affect the elderly cause pain & disability and reduce their quality of life, hence, raising their need for medication (72). In this respect, focus needs to be laid on the cognitive and physiologic changes that take place during aging and that predispose the elderly toward medication use (73). Therefore, it is essential to teach the correct use of drugs to the elderly and advise abstinence of self-medication through models that identify and strengthen factors affecting behavior. One of the models that can prove effective for this goal is the 'extended parallel process model' (EPPM). Based on the EPPM, if individuals believe that they are highly at risk of a disease or exposed to a health risk, they will be more stimulated to confront that threat. In fact, fear of a threat causes individuals to adopt certain behaviors to confront that health threat. If the threat assessment is realized, and the efficacy of the solutions is assessed, the possibility of attitude change, behavioral intention and behavior will increase (74).

Mild symptoms of disease, self-diagnosis of disease symptoms, previous use of medication, and ease of access to non-prescribed medication were among the most important determinant factors of self-medication. These factors have been repeatedly reported in earlier studies (30, 53, 65, 75-82). Moreover, the most significant groups of diseases that are self-medicated i.e. respiratory diseases, common cold and headache, are similar to the findings of other studies too (4, 79, 83-96). Likewise, the most significantly self-medicated drugs in Iran were similar to those self-medicated elsewhere (76, 92, 95, 97-103). Prioritizing these factors while planning for self-medication reduction can yield greater results.

Limitations: One of the main limitations of this study was our lack of access to certain databases. Furthermore, certain details had not been reported in the published articles, so they could not be extracted. Laying greater focus on complete and detailed reporting in future research can resolve this problem.

Conclusion

The results of current study show a relatively higher prevalence of self-medication among the Iranian population in community setting as compared to other countries in the world. Moreover, it was relatively high in special groups (students, elderly and households). The most important reason behind self-medication was the appearance of mild symptoms of disease. The most significant group of diseases that were self-medicated was respiratory diseases, and the most important groups of drugs self-medicated were analgesics and antibiotics. The detrimental effects of self-medication from the health, social and economic perspectives warrant the need for appropriate planning and policy-making to reduce it. Raising public awareness, culture-building, control & supervision of physicians' and pharmacies' performance can have beneficial effects in this regard.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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