Self-medication practices with conventional and herbal drugs among ear, nose, and throat patients

Olcay Kıroğlu1, Fatih Berktaş1, Zakir Khan1*, Muhammed Dağkıran2, Yusuf Karatas1

INTRODUCTION

Self-medication (SM) is a major public health issue around the world. It is a frequent practice in both developing and developed countries. Several studies have shown that inappropriate SM leads to wastages of health resources, raises pathogen resistance, and poses major health risks such as adverse drug reactions (ADRs), extended suffering, and dependency. It is reported that a higher number of medications in developed countries were obtained without a prescription and antibiotics. Nearly half of the patients used at least one herbal drug. The most commonly used herbal medications were Tilia cordata, Zingiber officinale, and Camellia sinensis. According to the International Union for Conservation of Nature Red List, most of the medicinal herbs were considered as data deficient/least concern. About 36.6% of the participants perceived that herbal drugs are effective for ear, nose, and throat problems. Moreover, 22.9% of the patients did not know about herbal-drug interaction with other medications. Therefore, it is important to conduct rigorous scientific procedures and clinical trials to guarantee the consistency and quality of herbal products. Ear, nose, and throat (ENT) diseases cause major disruption in patients’ daily lives. The prevalence of ENT diseases varies by geography and patient age. Self-practices with conventional and herbal drugs are common in ENT patients. Recent studies reported that the ENT patients’ self-practice with conventional medication ranged from 79.1–83%. It is also reported that the rate of herbal drug utilization among ENT patients ranges from 2–63% in different nations. Individuals may suffer serious consequences as a result of SM practices without consulting a medical expert.
The self-practices of over-the-counter (OTC) drugs and nonpharmaceutical products (e.g., vitamins, herbal products, and dietary supplements) are frequently used by the Turkish population\(^{10}\). These medications are available without a prescription, and people perceived that they are safe and effective. However, these medications can have adverse effects like prescription drugs and be misused or abused because of their active ingredient\(^{10,11}\). Herbal and conventional medicine’s concomitant use can also cause dangerous herb-drug interactions\(^{12}\).

In Turkey, ENT illnesses impact people of all ages and are an important public health issue\(^{13-15}\). However, literature searches revealed that previously no research examined the self-practices with conventional and herbal drug use among ENT patients in our study healthcare setting as well as in Turkey. Periodic studies are critical for assessing the usage of self-based medication practices in ENT patients and to give current insight to healthcare policy makers. Therefore, this study was carried out to assess the self-practices with conventional and herbal drug use among ENT patients at a tertiary care hospital in Turkey.

**METHODS**
A cross-sectional questionnaire-based survey was carried out among all ENT outpatients on their first visit to the otorhinolaryngology department at the tertiary care hospital in Adana, Turkey, in November 2017. This study was approved by the university’s Ethical Review Committee, and the research was carried out in accordance with the Helsinki Declaration (meeting no: 69; date: October 6, 2017; Supplementary file 1). Patients aged 17 years or older who attended an ENT department were included in the study, while respondents under the age of 17 and not willing to participate were excluded during the study period. This study used a convenience sampling technique. As per hospital data, an average of 750 patients visited the ENT department within 1 month. According to the Raosoft sample size calculator, the minimum calculated sample size was 255. The response distribution was assumed to be 50%, the margin of error was set at 5%, and the confidence level for the sample estimate was set at 95% (http://www.raosoft.com/samplesize.html).

A self-reported questionnaire was developed for this study based on a review of prior literature\(^{1,4,8,12}\). Three researchers reviewed the questionnaire instrument before the execution of the study to determine the appropriateness and validity (internal and external), along with the confirming adequacy of the questions. Data collection was conducted on a daily basis via a face-to-face approach. Informed consent was obtained from all participants.

The final 14-item questionnaire was divided into four sections:

1. demographic,
2. SM of conventional medicines,
3. herbal medication usage, and
4. perception regarding herbal medicines.

Demographic characteristics included age, gender, and education level. SM of conventional medicines included four questions regarding self-practices of conventional medication for ENT problems before visiting a hospital, types of medications, source of information, and their action regarding extra medications after the completion of treatment. The third section comprised four items regarding herbal medication use, types of herbal drugs, purpose of use, and source of information. The last section contained three questions related to the patient’s perception of herbal medicines. We also classify the herbal drugs according to the International Union for Conservation of Nature (IUCN) Red List (https://www.iucnredlist.org/).

The final data were collected and transferred to Microsoft Excel 365 (version 2108, Microsoft Corp., USA), and the findings were recorded in number and percentage form. The final results are presented in tabulated form.

**RESULTS**
Of the 255 questionnaires distributed among the patients who visited the ENT department during the study period, 183 completed the questionnaire, and the response rate was 71.7%. The reason given for not completing the questionnaire was lack of time in the clinic (n=69), while 13 questionnaires were excluded owing to incomplete data. Finally, this study included 183 patients with a mean age of 34.96 (SD ±15.81) years (Table 1). Notably, 82 (44.8%) patients reported SM before visiting a hospital. The most commonly used medicine was analgesics (31.7%) and antibiotics (21.9%). The participants also reported the combined use of different medication classes. Further details are listed in Table 1.

Nearly half of the patients (49.2%, n=90) used at least one herbal drug. Most of the patients indicated the usage of more than one herbal drug. The most commonly used herbal medications were *Tilia cordata* (78.8%), *Zingiber officinale* (62.2%), and *Camellia sinensis* (45.5%). The IUCN Red List classified the majority of the therapeutic herbs in this study as data deficient/least concerning (Table 2).

Among herbal users, 52 (57.8%) patients reported the purpose of usage. The most cited purposes of herbal drug use were common cold (26.9%) and general well-being (11.5%). None of the patients reported a qualified healthcare professional as a source of information for herbal drugs in this study. Additional information is provided in Table 3.
## Table 1. Demographic characteristics and self-practices with conventional drugs (n=183).

| Age                          | Frequency (n) |
|------------------------------|---------------|
| Average age                  | 34.96         |
| Minimum age                  | 17            |
| Maximum age                  | 86            |
| Standard deviation           | 15.81         |
| Gender                       |               |
| Male                         | 65 (35.5)     |
| Female                       | 118 (64.5)    |
| Education                    |               |
| Primary school               | 29 (15.8)     |
| Middle school                | 18 (9.8)      |
| High school                  | 52 (28.4)     |
| University or above          | 84 (45.9)     |
| None                         | 0 (0)         |
| Self-medication before visiting a hospital for ENT diseases (n=183) | n (%)*          |
| No                           | 101 (55.2)    |
| Yes                          | 40 (21.9)     |
| Sometimes                    | 42 (22.9)     |
| If yes/sometimes, which drugs (n=82) |               |
| Analgesic                    | 26 (31.7)     |
| Antibiotic                   | 18 (21.9)     |
| Flu/cold medicine            | 9 (10.1)      |
| Nasal spray                  | 4 (4.8)       |
| Throat spray                 | 3 (3.6)       |
| Ear drops                    | 2 (2.4)       |
| Lozenge                      | 2 (2.4)       |
| Inhalers                     | 1 (1.2)       |
| Antibiotic and analgesic     | 6 (7.3)       |
| Antibiotic and cold medicine | 2 (2.4)       |
| Antibiotic and nasal spray   | 2 (2.4)       |
| Antibiotic and lozenge       | 1 (1.2)       |
| Antibiotic and mouth wash    | 1 (1.2)       |
| Pain and fever reducer drug  | 2 (2.4)       |
| Analgesic and nasal spray    | 1 (1.2)       |
| Cough syrup and analgesic    | 1 (1.2)       |
| Analgesic, cold medicine, and nasal spray | 1 (1.2)       |
| Total                        | 82            |
| Information about the medicine used during your treatment of ENT |               |
| Pharmacist                   | 84 (45.9)     |
| Doctor                       | 75 (40.9)     |
| Neighbor/relative/friend     | 54 (29.5)     |
| Internet                     | 25 (13.6)     |
| The prospectus of the drug   | 6 (3.2)       |
| Other                        | 3 (1.6)       |
| What do you do with the extra medications after your treatment? |               |
| Kept in home                 | 87 (47.5)     |
| Throw it in the bin          | 58 (31.7)     |
| Give to the pharmacy         | 25 (13.6)     |
| Give to my relatives/friends/neighbor | 6 (3.3)       |
| Give to a family doctor      | 4 (2.2)       |
| Give to an emergency department in the hospital | 2 (1)         |
| My medication does not increase | 1 (0.5)      |

* n (%) is the number and percentage indicating that more than one response was permitted. ENT: ear, nose, and throat.
DISCUSSION

Self-medication practices are widespread among otorhinolaryngological patients\(^1,4,8,9\). In this study, the prevalence of SM with conventional drugs was 44.8% among ENT patients before visiting a hospital. A study conducted in Nepal among ENT outpatients revealed similar results (47.3%)\(^16\). A higher prevalence (99%) of self-practices with conventional medicine was revealed in a study conducted in Lebanon\(^9\). However, a lower percentage (31%) of SM practices among patients attending the ENT department was observed in Nigeria\(^17\). The variation in the reported prevalence rate in this study compared to previous studies may be due to the differences in study methodology, cultural factors, populations, study design, and sample size. A considerable proportion of the population uses self-practice with conventional medication, and this is a concerning issue and may have the potential risks of adverse effect\(^4\).

The most commonly used medicine was analgesic and antibiotics. Participants also reported a combined usage of different medication classes. This finding was also supported by the studies conducted in Brazil and Lebanon\(^8,9\). According to a meta-analysis of analgesics, cough medicines, dermatological products, nutritional supplements, and antibiotics were the most commonly self-practiced therapeutic drugs\(^18\). It is reported that if analgesics, cold drugs, cough syrups, and other OTC drugs are not used properly, they might harm the patient’s quality of life and intensify the symptoms\(^8,10,11\). According to the World Health Organization, antibiotic resistance is currently one of the most serious threats to global health, food security, and development. Antibiotic resistance can affect anyone, regardless of age or place\(^19\). Antibiotic SM is a major contributor to the current antibiotic resistance dilemma\(^19\). Proper public health education is required to enhance public awareness about the dangers of SM of antibiotics, as well as legislation restricting access to OTC drugs\(^8,10,11\).

In this study, a substantial proportion of the patients (49.2%) stated the use of at least one herbal drug for ENT illnesses before visiting the hospital. A previously published study in Kenya also reported substantial levels of herbal drug use (37.3%) among ENT patients\(^20\). A recent small-scale study conducted among patients suffering from chronic tinnitus in Turkey also reported the use of herbal medicines\(^21\). It is reported that the frequency of herbal medicine practices varies greatly among regions, countries, and around the world due to societal, traditional, and disease types\(^4,21\).

Linden (\(T.\) cordata), ginger (\(Z.\) officinale), and green tea (\(C.\) sinensis) were the most frequently reported herbal medication approaches in this study. Recent review-based articles stated the effectiveness of Linden in anxiety, colds, cough, cardiovascular, and respiratory disorders\(^22,23\). A recent review also provided evidence for the efficacy of ginger in reducing symptoms of nausea and vomiting\(^24\). Green tea has been reported to have potential health benefits, including antioxidant properties and anti-inflammatory effects\(^25\).

### Table 2. Herbal medication use among ear, nose, and throat outpatients (n=183)

| Use of herbal medicines | Frequency (n) | Percentage |
|-------------------------|---------------|------------|
| No                      | 93            | (50.8)     |
| Yes                     | 60            | (32.8)     |
| Sometimes               | 30            | (16.4)     |

| Herbal name (local name/scientific name) | n (%)* | IUCN Red List |
|------------------------------------------|--------|---------------|
| Linden (Ihlamur/\(Tilia\) cordata)       | 71 (78.8) | Least concern |
| Ginger (Zencefil/\(Zingiber\) officinale) | 56 (62.2) | Data deficient |
| Green tea (Yeşil çay/\(Camellia\) sinensis) | 41 (45.5) | Data deficient |
| Mint (Nane/\(Mentha\) longifolia)        | 17 (18.8) | Least concern |
| Lemon (Limon/\(Citrus\) limon)           | 17 (18.8) | Least concern |
| Garlic (Şarimsak/\(Allium\) sativum)      | 14 (15.5) | Least concern |
| Turmeric (Zerdaçal/\(Curcuma\) longa)    | 11 (12.2) | Data deficient |
| Fennel (Rezene/\(Foeniculum\) vulgare)   | 8 (8.8) | Least concern |
| Nettle (İçsaran/\(Urtica\) dioica)        | 8 (8.8) | Least concern |
| Grape seeds (Üzüm çekirdeği/\(Vitis\) vinifera) | 5 (5.5) | Least concern |
| Sage (Adaçayı/\(Salvia\) officinalis)     | 2 (2.2) | Least concern |
| Liquorice (Meyan kökü/\(Glycyrrhiza\) glabra) | 2 (2.2) | Least concern |
| Perforate St John’s-wort (Sarı kantaron/\(Hypericum\) perforatum) | 2 (2.2) | Least concern |
| Daisy (Koyungözü/Bellis perennis)        | 1 (1.1) | Data deficient |

*\(n\) (%) is the number and percentage indicating that more than one response was permitted. IUCN: The International Union for Conservation of Nature.
Table 3. The purpose of use, source of information, and patients’ perception of herbal drugs.

| Purpose of use (n=52)                      | n (%)* |
|-------------------------------------------|--------|
| Common cold                               | 27 (51.9) |
| General well-being                        | 10 (19.2) |
| Relaxation                                | 4 (7.6) |
| Disease prevention                        | 2 (3.8) |
| Fever                                     | 2 (3.8) |
| Throat pain                               | 2 (3.8) |
| Shortness of breath                       | 1 (1.9) |
| Cough                                     | 1 (1.9) |
| Immunity                                  | 1 (1.9) |
| Headache                                  | 1 (1.9) |
| Weight problem                            | 1 (1.9) |
| Sources of information                    |        |
| Internet                                  | 114 (62.3) |
| Environment (neighbor/relative/friend)    | 57 (31.1) |
| Media (TV, newspaper)                     | 30 (16.4) |
| Book magazine                             | 24 (13.1) |
| Qualified healthcare professionals (doctor/pharmacist/nurse, etc.) | 0 (0) |

What do you think about herbal treatment for ENT treatment?

- Noneffectuve                        | 105 (57.4) |
- Effective                          | 67 (36.6) |
- Uncertain                          | 11 (6) |

Did you know that herbal products/drugs may interact with other medicines?

- Yes                                | 125 (68.3) |
- No                                 | 42 (22.9) |
- Sometimes                          | 16 (8.7) |

Did you know that herbal products/drugs also have side (adverse) effects?

- Yes                                | 121 (66.1) |
- No                                 | 34 (18.6) |
- Sometimes                          | 28 (15.3) |

*n (%) is the number and percentage indicating that more than one response was permitted. ENT: ear, nose, and throat.
Despite these limitations, this study has some strengths. This is the first study to evaluate SM practices with conventional and herbal drugs among ENT patients in our healthcare setting. This study targeted both conventional and herbal medicines to self-medicate, and these results may serve as an excellent starting point for further investigation. This study also provides a baseline of local data concerning SM practices (conventional and herbal medications), and the results may be beneficial for practical clinics, healthcare professionals, and policy makers.

CONCLUSIONS
This study observed a considerable prevalence of self-based practices with conventional and herbal medications in ENT patients who attended the general otolaryngology clinic. Strict national regulations on conventional and herbal medication access and long-term actions should be implemented to discourage inappropriate drug use. A patient education program concerning the effects of SM practices is also urgently needed.

REFERENCES
1. Olajide TG, Aremu KS, Esan OT, Dosunmu AO, Raji MM. Topical ear drop self-medication practice among the Ear, Nose, and Throat patients in Ilo Ekiti, Nigeria: a cross-sectional study. Ann Afr Med. 2018;17(2):70-4. https://doi.org/10.4103/aam.aam_28_17
2. Mekuria AB, Birru EM, Tesfa MT, Geta M, Kifle ZD, Amare T. Prevalence and Predictors of Self-Medication Practice Among Teachers’ Education Training College Students in Amhara Region, Ethiopia: A Cross-Sectional Study. Front Pharmacol. 2021;11:593764. https://doi.org/10.3389/fphar.2020.593764
3. van Andel T, Carvalheiro LG. Why urban citizens in developing countries use traditional medicines: the case of suriname. Evid Based Complement Alternat Med. 2013;2013:687197. https://doi.org/10.1155/2013/687197
4. Laccourreye O, Werner A, Laccourreye L, Bonhils P. Benefits, pitfalls and risks of phytotherapy in clinical practice in otorhinolaryngology. Eur Ann Otorhinolaryngol Head Neck Dis. 2017;134(2):95-9. https://doi.org/10.1016/j.janrol.2016.11.001
5. Lopes CMC, Lazzarini JR, Soares Júnior JM, Baracat EC. Phytotherapy: yesterday, today, and forever? Rev Assoc Med Bras (1992). 2018;64(9):765-8. https://doi.org/10.1590/1806-9282.64.09.765
6. Lopes CMC, Lima SMRR, Veiga ECA, Soares Júnior JM, Baracat EC. Phytotherapeutic medicines: reality or myth? Rev Assoc Bras (1992). 2019;65(3):292-4. https://doi.org/10.1590/1806-9282.65.3.292
7. Dwivedi S, Chopra D. Adverse effects of herbal medicine. Clin Med (Lond). 2013;13(4):417-8. https://doi.org/10.7861/clinmedicine.13-4-417a
8. Servidoni AB, Coelho L, Navarro ML, Avila FG, Mezzalira R. Self-medication profile of ENT patients. Braz J Otorhinolaryngol 2006;72(1):83-8. https://doi.org/10.1016/S1808-8694(15)30038-0
9. Awada S, Diab B, Khachman D, Zeidan RK, Slim H, Zein S, et al. Self-medication practices and knowledge among lebanese population: a cross-sectional study. Dr Sulaiman Al Habib Medical Journal. 2020;2(2):56-64. https://doi.org/10.2991/dshmj.k.200507.002
10. Memişoğlu M, Bilgen Ö. Strategic analysis of the Turkish over-the-counter drugs and non-pharmaceutical products market. Turk J Pharm Sci. 2021;18(3):252-61. https://doi.org/10.4274/tjps.galenos.2020.19052
11. Barrenberg E, Garbe E. Use of over-the-counter (OTC) drugs and perceptions of OTC drug safety among German adults. Eur J Clin Pharmacol. 2015;71(11):1389-96. https://doi.org/10.1007/s00228-015-1929-5
12. Meshesha SG, Yeshak MY, Gebretekile GB, Tilahun Z, Fenta TG. Concomitant Use of Herbal and Conventional Medicines among Patients with Diabetes Mellitus in Public Hospitals of Addis Ababa, Ethiopia: A Cross-Sectional Study. Evid Based Complement Alternat Med. 2020;2020:4871459. https://doi.org/10.1155/2020/4871459
13. Özler GS, Yenigül E. Why do geriatric patients visit otorhinolaryngology? Ear Nose Throat J. 2016;95(6):224-9. PMID: 27304440
14. Cingi C, Topuz B, Songu M, Kara CO, Ural A, Yaz A, et al. Prevalence of allergic rhinitis among the adult population in Turkey. Acta Otolaryngol. 2010;130(5):600-6. https://doi.org/10.3109/00016480903311880
15. Öztürk Ö, Harputluoglu U, EgeI E, Orhan F, Mayda A. Evaluation of Otorhinolaryngological Disease-Screening Results and Socioeconomic Status in Primary School Children. Turk Arch Otorhinolaryngol. 2003;41:213-7.
16. Pohkarel R, Chapagain K. Prevalence of self-medication among patients visiting outpatient services of ear nose and throat department of government hospital of eastern Nepal. Nepal Jent Head Neck Surg [Internet]. 2016[cited on Feb 22, 2022];7(1):15-20. Available from: https://njehn.org.np/index.php/njehn/article/view/158
17. Afolabi OA, Elhaliyi BF, Fadare JO, Abdur-Rahman AB, Elhaliyi DN. Survey of otophatical self-medication among patients attending ENT and family medicine departments in a Nigerian hospital. Eur J Gen Pract. 2011;17(3):167-70. https://doi.org/10.1111/j.1381-4788.2011.056323
18. Guajano MR, Bert F, Passi S, Stillo M, Galis V, Manzoli L, et al. Use of self-medication among adolescents: a systematic review and meta-analysis. Eur J Public Health. 2015;25(3):444-50. https://doi.org/10.1093/eurpub/cku207

AUTHORS’ CONTRIBUTIONS
OK: Conceptualization, Project administration, Writing – review & editing. FB: Conceptualization, Project administration, Writing – review & editing. ZK: Conceptualization, Project administration, Writing – review & editing. MD: Project administration, Writing – review & editing. YK: Project administration, Writing – review & editing.
19. World Health Organization. Antibiotic resistance. 2021[cited on Feb 24, 2022]. Available from: https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance

20. Njoroge GN, Bussmann RW. Traditional management of ear, nose and throat (ENT) diseases in Central Kenya. J Ethnobiol Ethnomed. 2006;2:54. https://doi.org/10.1186/1746-4269-2-54

21. Vayisoglu SK, Gur H. Complementary and Alternative Medicine Use among Patients with Chronic Tinnitus. J Arch Nurs Health Care 2020;6:146. https://doi.org/10.23937/2469-5823/1510146

22. Sultana S, Khan A, Safhi MM, Alhazmi HA. Cough suppressant herbal drugs: a review. Int J Pharm Sci Invent. 2016[cited on Feb 24, 2022];5(5):15-28. Available from: http://www.ijpsi.org/Papers/Vol5(5)/D0505015028.pdf

23. Ongan D. Habit of Using Herbal Products of Adults Living in Kayseri. JHS 2018[cited on Feb 25, 2022];27(2):125-31. Available from: https://dergipark.org.tr/en/pub/eujhs/issue/44575/553254

24. Sánchez M, González-Burgos E, Iglesias I, Lozano R, Gómez-Serranillos MP. Current uses and knowledge of medicinal plants in the Autonomous Community of Madrid (Spain): a descriptive cross-sectional study. BMC Complement Med Ther. 2020;20(1):306. https://doi.org/10.1186/s12906-020-03089-x

25. Yamprasert R, Chanvimalueng W, Mukkasombut N, Itharat A. Ginger extract versus Loratadine in the treatment of allergic rhinitis: a randomized controlled trial. BMC Complement Med Ther. 2020;20(1):119. https://doi.org/10.1186/s12906-020-2875-z

26. Niculescu AG, Grumezescu AM. Natural compounds for preventing ear, nose, and throat-related oral infections. Plants (Basel). 2021;10(9):1847. https://doi.org/10.3390/plants10091847

27. Karataş Y, Khan Z, Bilen Ç, Boz A, Özاغil ESG, Abussuutoğlu AB, et al. Traditional and complementary medicine use and beliefs during COVID-19 outbreak: a cross-sectional survey among the general population in Turkey. Adv Integr Med. 2021;8(4):261-6. https://doi.org/10.1016/j.aimed.2021.09.002