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Research Article

A Cross-Sectional Study of Self-Medication Practices Among Adults of District Nowshera, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Self-medication is using any drug or medicine to treat illness without the physician's advice. In the present study, we aimed to assess self-medication practices among the general population of District Nowshera, Pakistan. A community-based cross-sectional study was conducted between December 2021 and January 2022. A well-structured interview questionnaire was designed, and data were collected from 400 random participants through face-to-face interviews. The overall prevalence rate of self-medication was found to be 96.8 percent. Headache and flu were reported as the most common complaints for self-medication practice. Knowledge about medicines was the frequently reported reason for self-medication practice, while home remedies, antibiotics, and multivitamins were the leading medicines. Direct purchase from pharmacies was the main source of availability of the drugs for self-medication. In conclusion, we report a high prevalence of self-medication practices and suggest that proper education and awareness about drug use, along with strict monitoring of drug sales, are required to help minimize self-medication practices in the general population.

Keywords: Self-medication, Prevalence rate, Community-based cross-sectional study, Home remedies, Antibiotics, Nowshera, Khyber Pakhtunkhwa, Pakistan

INTRODUCTION

Healthfulness is a basic need of life, and having a sound healthcare system in one's surroundings is, thus, very important. However, less or almost no accessibility to healthcare facilities or appropriate and affordable medications has been observed in developing countries. Consequently, most diseases are treated with self-medication (Zeru et al., 2020). Self-medication can be defined as consuming and obtaining medications without the physician's guidance (Yousef et al., 2008). According to WHO, self-medication is "the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms" (Shalin & Logaraj, 2021). Self-medication involves using herbal remedies, re-use of old prescriptions, and directly buying medications from pharmacies without prescription (Awad et al., 2006).

Self-medication can be beneficial or harmful (Aqeel et al., 2014). Self-medication benefits individuals and the healthcare system as it builds confidence in patients to manage and take responsibility for their health and can help avoid unnecessary medical consultations (Yousef et al., 2008). Additionally, self-medication also benefits the pharmaceutical industry

as access to their product increases due to the purchase of drugs on old prescriptions since the generic name is also mentioned there. Thus, self-medication promotes the sale of pharmaceutical brands already mentioned on the prescription (Hughes et al., 2001). World Health Organization (WHO) has specified that appropriate self-medication practices can be beneficial for treating minor diseases that do not require health specialist consultation, save time and money, and provide a cheaper way of treating minor diseases (Al Flaiti et al., 2014).

However, improper use of self-medication has also been reported in the literature, which results in the misuse of commonly used medicines or overuse of common medications and home remedies for the treatment of serious diseases, which has resulted in the masking of serious disorders (Yousef et al., 2008). Previous studies show that inappropriate usage of self-medication has resulted in various kinds of health risks. Possibilities associated with self-medication practices include hindrance in the treatment of serious disorders, drug interactions, excess use of drug dosage, use of drugs for a long time, and polypharmacy (Hughes et al., 2001). Self-medication practices cannot be eliminated entirely from society, although some interventions can be made to discourage abnormal use of it. More education about self-medication is required for medical professionals and the public to avoid the irrational misuse of drugs. All people involved in self-medication must know the pros and cons of self-medication products (Ayalew, 2017).

Among different populations, self-medication patterns vary and are impacted by gender, age, income, education, and knowledge of medicine (Almasdy & Sharrif, 2011). People prefer self-medication for minor ailments instead of consulting health experts to save money and time (Al Flaiti et al., 2014). People practice self-medication due to several other reasons, such as lack of health facilities, low income, urge for self-care, excessive advertisements of drugs, previous medical history, leftover medicines at home, and easy accessibility of drugs in developing countries (Kassie et al., 2018; Imtiaz et al., 2013).

Self-medication can sometimes become harmful for the users. Many complications may arise from self-medication practices, such as allergy, antibiotic resistance, kidney damage, and vitamin poisoning due to excessive use of vitamins. Analgesics used in self-medication practices also lead to various risks. In Pakistan, a lot of drugs, including antibiotics, are readily available without prescription from pharmacies (Imtiaz et al., 2013). Self–medication could lead to various serious problems, and people usually have no idea about drug resistance and multiple complications caused by medicines. Several studies are available from the different regions of the country, but no such information is available from the proposed study area. Therefore, the present study was conducted to determine the status of self-medication practice, views towards self-medication, and factors contributing towards self-medication practices among the general population of district Nowshera.

MATERIALS AND METHODS

Study's area, design, and time period

A community-based cross-sectional study was conducted in district Nowshera from December 2021 to January 2022. The district falls within the geographic territory of the province of Khyber Pakhtunkhwa and has a total human population of about 1,518,540. The study population included all people aged ≥ 15 years. The sample size for the present study was calculated using the formula by Yamane (1967) with a 95% confidence level and a p=0.05 level of precision.

$$\mathbf{n = N/1+N(e)^2}$$

where n is the sample size, N = (1,518,540) is the population size, and e= 0.05 is the level of precision. According to the formula, the required sample size was 400.

Face-to-face interviews were conducted using a well-structured questionnaire. The questions were adapted from previous literature available on self-medication practices (Rangari et al., 2020; Kassie et al., 2018; Jember et al., 2019; Aqeel et al., 2014; Araia et al., 2019). The questionnaire was divided into three sections to assess residents' knowledge, attitude, and practices toward self-medication. The first section included questions related to the socio-demographic information of the participants (Age, sex, residence, marital status, occupation, and education). The second section included questions related to participants' general information about self-medication, sources of information on self-medication, and reasons responsible for self-medication practice. The third section included questions related to their knowledge and attitudes towards medicines. The collected data was checked for consistency and completeness before entry. Data was coded and entered into SPSS for further analysis. Descriptive statistics, including frequencies and percentages, were used for data presentation.

RESULTS

Socio-demographic characteristics of respondents

In this study, 400 individuals were interviewed, out of whom 55.8% resided in rural areas. The participants comprised 55.8% males and 44.3% females. Concerning marital status, 64.8% were unmarried, while the remainder were married. The majority of the participants (57.5%) were aged between 15 and 24. A small 7.7% had no formal education, while the larger proportion (36.3%) had achieved up to a graduate-level education (Table 1).

Table 1: Socio-demographic characters of the participants (n=400).

Variables	Frequency	%
Gender		
Female	177	44.3
Male	223	55.8
Age		
15-24	230	57.5
25-34	95	23.8
35-44	40	10.0
45+	35	8.8
Marital status		
Married	141	35.3
Unmarried	259	64.8
Residence		
Urban	177	44.3
Rural	223	55.8
Education		
Matric	120	30.0
Intermediate	104	26.0
Graduation	145	36.3
Uneducated	31	7.7
Occupation		
Doing Job	115	28.8
Jobless	47	11.8
Housewife	50	12.5
Student	188	47.0

Status of Self-medication Practices

In this study, 387 participants (96.8%) reported practicing self-medication. Among them, 81.9% claimed to remember the names of the drugs they use. 26.4% reported that they had encountered adverse reactions, while the majority (73.6%) reported no adverse effect of self-medication. In addition, 88.1% of the participants reported checking the expiry date of drugs before use, while 59.2% reported checking the leaflet in the drug package when practicing self-medication. About 22.7% of the respondents revealed facing family/friend pressure regarding self-medication (Table 2).

Table 2: Self-medication practices among the general population of district Nowshera.

Variables	Frequency	%
Self-medication		
Yes	387	96.8
No	13	3.3
Did you remember the name of drugs? n=387		
Yes	317	81.9
No	70	18.1
Did you encounter any adverse reaction during self-medication? n=387		
Yes	102	26.4
No	285	73.6
Did you ever check the expiry date of the drug before using it? n=387		
Yes	341	88.1
No	46	11.9
Did you ever check the leaflet within the drugs package during self-medication practice? n= 387		
Yes	229	59.2
No	158	40.8
Peer/Family pressure? n=387		
Yes	88	22.7
No	299	77.3

Of the 387 participants practicing self-medication, 225 (58.1%) reported knowledge about medicine as the main reason for self-medication practices. In contrast, 88 participants (22.7%) reported mild illness, 46 (11.9%) mentioned a lack of access to healthcare facilities, and 28 (7.2%) cited fear of developing a more serious condition as the main factor driving their self-medication practices (Figure 1). Concerning the source of information for self-medication, the majority, 221 participants (54.5%), identified friends/family as the main information source on self-medication, followed by relying on information from their previous experience of using a particular medicine (97 participants, 25.1%), their own initiative (50 participants, 12.9%), or on information from the internet (29 participants, 7.5%). When it comes to the sources of drugs

for self-medication, most participants (230 participants, 59.4%) indicated direct purchase from the pharmacy as the primary source of medicine. In comparison, others reported unused medicines at home (99 participants, 25.6%) or burrowing from friends/family (58 participants, 15%). Concerning the form of medication used, the majority preferred taking tablets (286 participants, 73.9%), followed by syrup (67 participants, 17.3%), and a few using both syrups and tablets (34 participants, 8.8%).

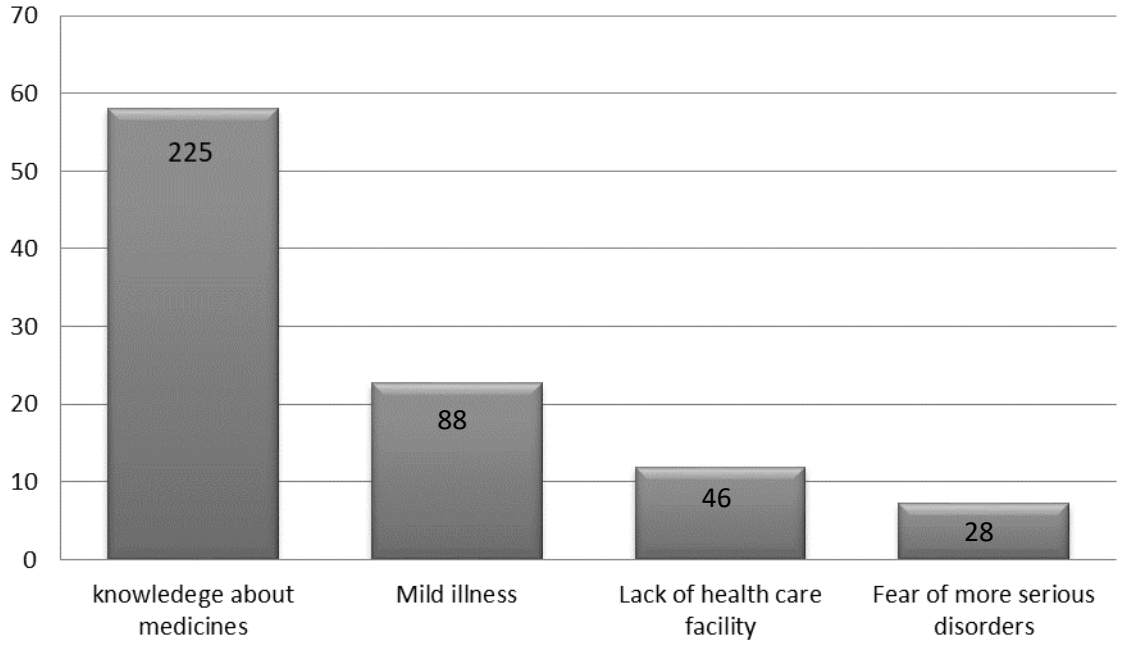

Figure 1: Reasons for self-medication practices identified by the respondents

The study found that despite access to nearby health facilities for a large number of participants (87.6%), most of them still practiced self-medication. Likewise, 54.0% of the participants engaged in self-medication did not have medical professionals in their families. Among the factors contributing to self-medication practices, 81.1% of participants reported the already available medicines at their homes, about 83.7% and 74.9% considered respectively time and money, and 60.2% of participants deemed high consultation fees as contributing factors to self-medication (Table 3). The majority of participants reported practicing self-medication for headaches (88.6%), followed by flu (86.8%) and vomiting (58.9%) (Figure 2). The most commonly used classes of medicine were home remedies (69.5%), antibiotics (48.1%), and multivitamins (45%) (Figure 3). In addition, 59.2% of respondents reported understanding the risk of self-medication. while 56.1% considered it a good practice. Around half of the participants (50.4%) reported advising self-medication to others. More than half of them reported being aware of drug resistance (51.7%) and avoiding medicine use during pregnancy (54.0%) (Table 4).

Table 3: Personal attitudes and factors contributing to self-medication (n=387).

Variables	Frequency	%
Do you have health facility in nearby?		
Yes	339	87.6
No	48	12.4
Medical professional in family?		
Yes	178	46.0
No	209	54.0

Medications at home?		
Yes	314	81.1
No	73	18.9
Self-medication time saving?		
Yes	324	83.7
No	63	16.3
Self-medication money saving?		
Yes	290	74.9
No	97	25.1
Doctor fee is high in your area?		
Yes	233	60.2
No	154	39.8

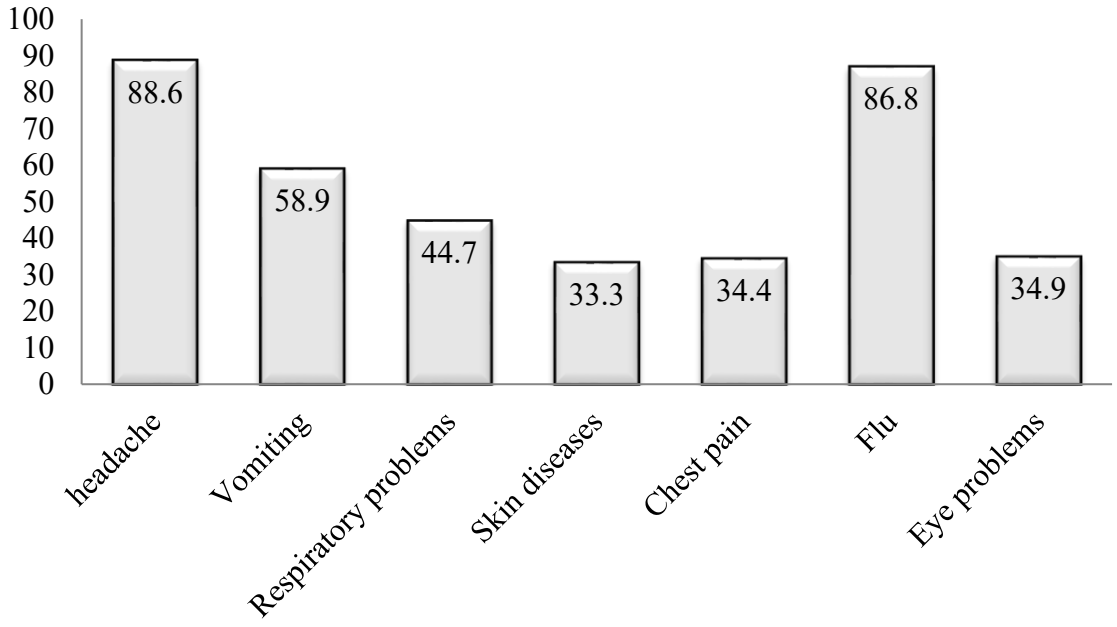

Figure 2: Complaints for which respondents were practicing self-medication

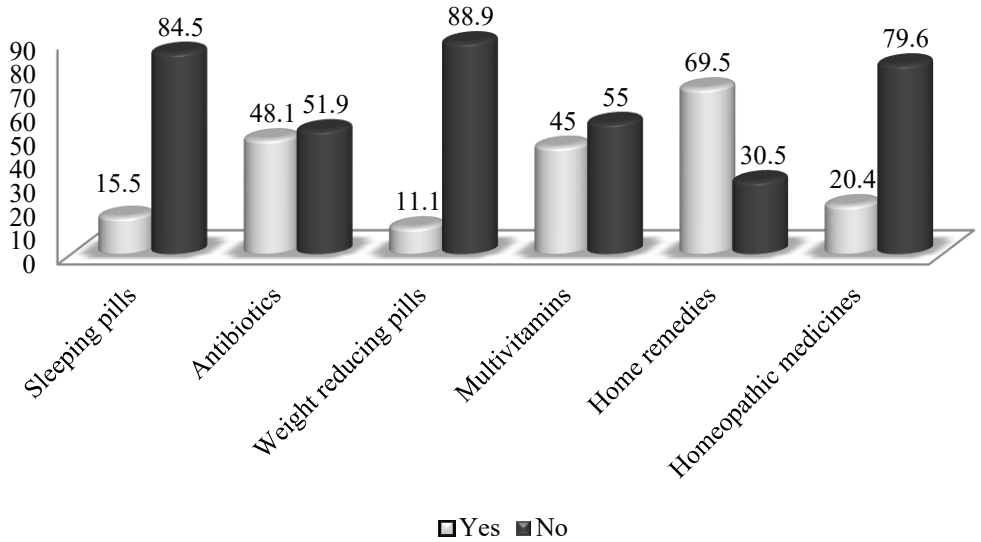

Figure 3: Most common medicines/drugs used in self-medication

Table 4: Knowledge among respondents towards self-medication (n=387).

Variables	Frequency	%
Are you aware of self-medication hazards?		
Yes	229	59.2
No	158	40.8
Do you believe self-medication is good practice?		
Yes	217	56.1
No	170	43.9
Do you advice self-medication to others?		
Yes	195	50.4
No	192	49.6
Do you believe self-medication is safe to use?		
Yes	216	55.8
No	171	44.2
Are you aware about drug resistance?		
Yes	200	51.7
No	187	48.3
Are you aware that drugs should be avoided in pregnancy?		
Yes	209	54.0
No	178	46.0

DISCUSSION

Our study reports a high prevalence rate of self-medication (96.8%), which is in agreement with previous studies from different cities in Pakistan. For instance, different regions of Pakistan, such as Lahore, Sargodha, Karachi, the rural population of Karachi, and University students of Abbottabad, have shown prevalence rates of 88%, 95%, 83%, 84.8%, 85%, and 95.5% respectively (Khan et al., 2022; Akram et al., 2019; Imtiaz et al., 2013; Afridi et al., 2015; Haseeb & Bilal 2016; Ullah et al., 2013). Similarly, studies conducted outside Pakistan have identified higher prevalence rates in Muscat, Sohar region of Sultanate of Oman, Nigeria, Iran, Kuwait, Thailand, France and Nepal (94%, 91.4, 83%, 89.6%, 97.8%, 88.2%, 95%, 95.4% respectively) (Al Flaiti et al., 2014; Osemene & Lamikanra 2012; Jafari et al., 2015; Abdi et al., 2018; Al-Hussaini et al., 2014; Chautrakarn et al., 2021; Gras et al., 2020; Shah et al., 2021). However, a prevalence rate lower than our findings has been reported in Northeast Ethiopia, Chennai, and Tamil Nadu (35.9% and 32.5%, respectively) (Kassie et al., 2018; Shalini & Logaraj, 2021). These differences in prevalence rates could be attributed to various factors, including socioeconomic disparities, sampling methods, sample size, law enforcement, study designs, and inclusion/exclusion criteria used in the study, as well as differing definitions of self-medication by researchers (Kifle et al., 2021; Sridhar et al., 2018).

In addition to the prevalence rate, we also investigated the reasons for self-medication practices. We found that knowledge about medicines was the main reason for participants' self-medication practice, followed by the perception of illness as mild. This aligns with a study conducted in Harar (Ethiopia), where knowledge about medicine also stood out as the main reason for self-medication (Hailemichael et al., 2016). However, other studies have reported different results, with perceptions of “illness as mild” being the primary reason for self-medication in India, Northeast Ethiopia, and the capital territory of Pakistan (Kassie et al., 2018; Aqeel et al., 2014; Patil et al., 2014). The discrepancy in results might partially be

explained by the fact that, in the present study, most of the participants were educated and had knowledge of medicine usage, prompting them to choose self-medication for mild illnesses. We further investigated the sources of knowledge about medicines and found that friends/family and past experiences were the main sources of information on self-medication, consistent with findings from previous studies in Gujarat (India) (Parmar et al., 2015) and Faisalabad (Pakistan) (Khan et al., 2014). However, few other studies have reported doctors' previous prescriptions as the source of information on self-medication (Keshari et al., 2014; Akram et al., 2019).

Next, we also inquired about the sources of drugs used in self-medication and, similar to the studies from Eritrea, Ethiopia, Southern China, Karachi, Pakistan, and Southwestern Nigeria (Araia et al., 2019; Zeru et al., 2020; Pan et al., 2012; Limaye et al., 2017; Osemene and Lamikanra, 2012) found out that direct purchase from pharmacies was the main source compared to unused medicines at home or from friends/family members. The accessibility of drugs from pharmacies can be attributed to weak legislation regarding the sale of medicines without prescriptions.

Moreover, upon collecting additional information, a higher number (73.6%) of participants, in agreement with previous studies from Eritrea (82.5%), Katmandu (Nepal) (83.53%), and Northwest Ethiopia (86.8%) (Araia et al., 2019; Bhattarai et al., 2014; Jember et al., 2019), revealed that they did not encounter any adverse reactions during self-medication practices, possibly reflecting participants' education and proper knowledge of drug types and dosages. Around 88.1% of respondents reported checking the expiry date before using medicines, consistent with similar studies from Andhra Pradesh (81.4%) (Rangari et al., 2020) and Katmandu (Nepal) (94.30%) (Bhattarai et al., 2014). In contrast, 43.2% and 53.3% of participants from Northwest Ethiopia and Pune (India), respectively, responded with not checking the expiry date before using medications during self-medication practices (Jember et al., 2019; Kumar et al., 2022). Similar to the studies conducted in Harar (Ethiopia) and Katmandu (Nepal) (Hailemichael et al., 2016; Bhattarai et al., 2014), a large number of participants (59.2%) of the present study reported checking the instruction leaflet provided with the drug. In contrast, only 13.4% of participants from Northwest Ethiopia reported checking the instruction leaflet (Jember et al., 2019), possibly reflecting differences in the education level of participants. The study found that participants have peer/family pressure to practice self-medication. Similar findings were reported in other studies conducted in different regions of Ethiopia (Jember et al., 2019; Kassie et al., 2018), possibly because family members share their experiences and advice due to living in similar conditions. Contrary to a study conducted in Northeast Ethiopia (Kassie et al., 2018), the majority of the participants in the study reported having medications at home, while nearly half reported having a medical professional in their family, which could contribute to their self-medication behavior. The former could be due to the easy accessibility of drugs in the country, leading people to stock medications at home for later use when similar symptoms reoccur. Similar to a previous study from Kermanshah (Iran) and unlike studies conducted in rural Barabanki, Amman, Jordan, Gujrat, and UAE, many participants believed that self-medication was a time-saving and cost-effective practice (Keshari et al., 2014; Yousef et al., 2008; Parmar et al., 2015). These differences in results may be attributed to variations in the lifestyle and economic status of the participants from these countries. The most common complaint for self-medication was reported to be headache, followed by flu, which aligns with findings from other studies conducted in Faisalabad (Pakistan), Lahore (Pakistan), Kuwait, and UAE (Khan et al., 2014; Akram et al., 2019; Al-Hussaini et al., 2014; Sridhar et al., 2018), probably reflecting the busy lifestyles of the participants, leading them to treat minor complaints at home rather than seeking professional medical help. Home remedies were identified as the most frequently used form of self-

medication (reported by 69.5% of participants), which is higher than the percentage (23.3%) reported in a study conducted in Gujarat (Parmar et al., 2015), possibly suggesting a preference for traditional or folk remedies over pharmaceutical products. The study also highlighted a concerning high usage of antibiotics in self-medication practices (reported by 48.1% of the participants), which raises issues related to antibiotic resistance and potential misuse of these medications. These results were comparable with findings from other studies conducted in different regions, including Lahore (Pakistan), Iran, Ethiopia, and South India, where the use of antibiotics in self-medication ranged from 34 to 48.7% (Akram et al., 2019; Hailemichael et al., 2016; Abdi et al., 2018; Badiger et al., 2012). These findings highlight the need for interventions to promote responsible use of antibiotics and raise awareness about the risks associated with their inappropriate consumption. More than half of the participants demonstrated an understanding of the hazards of self-medication, consistent with a survey from South India (Nair et al., 2013). Still, nearly half of the participants, in line with a study conducted in Eritrea (Araia et al., 2019), reported recommending self-medication to others, illustrating a divergence in attitudes regarding the perceived safety and efficacy of self-treatment.

In conclusion, the prevalence of self-medication was very high in the study. The higher use of antibiotics among allopathic medicines raises serious concerns. In light of these results, steps such as proper education and awareness campaigns, law implementation, and strict monitoring of drug sales should be considered to address the prevalence of self-medication and promote responsible medication use within the population.

Data availability

All data is available in the manuscript.

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Competing interests

The authors declare no competing interests.

References

Abdi, A., Faraji, A., Dehghan, F., & Khatony, A. (2018). Prevalence of self-medication practice among health sciences students in Kermanshah, Iran. *Biomed Central Pharmacology and Toxicology*, 19(1), 1-7.

Afridi, M. I., Rasool, G., Tabassum, R., & Shaheen, M. (2015). Prevalence and pattern of self-medication in Karachi: A community survey. *Pakistan Journal of Medical Sciences*, 31(5), 1241-1245.

Akram, A., Maqsood, U., Latif, M. Z., Arshad, H. S., Riaz, H., & Qureshi, M. A. (2019). Self-medication phenomenon; a population-based study from Lahore. *The Journal of the Pakistan Medical Association*, 69(4), 523–526.

Al Flaiti, M., Al Badi, K., Hakami, W. O., & Khan, S. A. (2014). Evaluation of self-medication practices in acute diseases among university students in Oman. *Journal of Acute Disease*, 3(3), 249-252.

Al-Hussaini, M., Mustafa, S., & Ali, S. (2014). Self-medication among undergraduate medical students in Kuwait with reference to the role of the pharmacist. *Journal of Research in Pharmacy Practice*, 3(1), 23-27.

Almasdy, D., & Sharrif, A. (2011). Self-Medication Practice with Nonprescription Medication among University Students: a review of the literature. *Archives of Pharmacy Practice*, 2(3), 95-100.

Aqeel, T., Shabbir, A., Basharat, H., Bukhari, M., Mobin, S., Shahid, H., & Waqar, S. A. (2014). Prevalence of self-medication among urban and rural population of Islamabad, Pakistan. *Tropical Journal of Pharmaceutical Research*, 13(4), 627-633.

Araia, Z. Z., Gebregziabher, N. K., & Mesfun, A. B. (2019). Self medication practice and associated factors among students of Asmara College of Health Sciences, Eritrea: a cross sectional study. *Journal of Pharmaceutical Policy and Practice*, 12(1), 1-9.

Awad, A. I., Eltayeb, I. B., & Capps, P. A. (2006). Self-medication practices in Khartoum state, Sudan. *European Journal of Clinical Pharmacology*, 62(4), 317-324.

Ayalew, M. B. (2017). Self-medication practice in Ethiopia: a systematic review. *Patient Preference and Adherence*, 11, 401-413.

Badiger, S., Kundapur, R., Jain, A., Kumar, A., Pattanshetty, S., Thakolkaran, N., Bhat, N., & Ullal, N. (2012). Self-medication patterns among medical students in South India. *The Australasian Medical Journal*, 5(4), 217–220.

Bhattarai, N., Basyal, D., & Bhattarai, N. (2014). Self medication practice among undergraduate pharmacy students in Kathmandu Valley, Nepal. *International Journal of Pharma Sciences and Research*, 5(11), 737-746.

Chautrakarn, S., Khumros, W., & Phutrakool, P. (2021). Self-medication with over-the-counter medicines among the working-age population in metropolitan areas of Thailand. *Frontiers in pharmacology*, *12*, 726643.

Gras, M., Champel, V., Masmoudi, K., & Liabeuf, S. (2020). Self-medication practices and their characteristics among French university students. *Therapies*, *75*(5), 419-428.

Hailemichael, W., Sisay, M., & Mengistu, G. (2016). Assessment of knowledge, attitude, and practice of self-medication among Harar Health Sciences College students, Harar, Eastern Ethiopia. *Journal of Drug Delivery and Therapeutics*, 6(5), 31-36.

Haseeb, A., & Bilal, M. (2016). Prevalence of using non prescribed medications in economically deprived rural population of Pakistan. *Archives of Public Health*, 74(1), 1-7.

Hughes, C. M., McElnay, J. C., & Fleming, G. F. (2001). Benefits and risks of self medication. *Drug Safety*, 24(14), 1027-1037.

Imtiaz, S., Salam, N. A., & Kamran, M. (2013). Conditions, frequencies, and sociodemographic factors leading self medication practice in Sargodha area of Punjab Pakistan. *Journal of Applied Pharmacy*, 5, 151-158.

Jafari, F., Khatony, A., & Rahmani, E. (2015). Prevalence of self-medication among the elderly in Kermanshah-Iran. *Global Journal of Health Science*, 7(2), 360-365.

Jember, E., Feleke, A., Debie, A., & Asrade, G. (2019). Self-medication practices and associated factors among households at Gondar town, Northwest Ethiopia: a cross-sectional study. *Biomed Central Research Notes*, 12(1), 1-7.

Kassie, A. D., Bifftu, B. B., & Mekonnen, H. S. (2018). Self-medication practice and associated factors among adult household members in Meket district, Northeast Ethiopia, 2017. *Biomed Central Pharmacology and Toxicology*, 19(1), 1-8.

Keshari, S. S., Kesarwani, P., & Mishra, M. (2014). Prevalence and pattern of self-medication practices in rural area of Barabanki. *Indian Journal of Clinical Practice,* 25(7), 636-9.

Khan, H., Maheen, S., Alamgeer, G. A., Mahmood, A., Sarfraz, R. M., Ashraf, Z., ... & Malik, M. N. H. (2014). Determinants of increasing trend of self-medication in a Pakistani community. *Tropical Journal of Pharmaceutical Research*, 13(3), 437-443.

Khan, K., Zaman, A., Hashmi, F. K., & Khan, R. (2022). A Population based Study on Self Medication Practice in Pakistan. Al-Kindy College Medical Journal, 18(2), 90-95.

Kifle, Z. D., Mekuria, A. B., Anteneh, D. A., & Enyew, E. F. (2021). Self-medication practice and associated factors among private health sciences students in Gondar Town, North West Ethiopia. A Cross-Sectional Study. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, *58*, 00469580211005188.

Kumar, A., Reddy, E. S., Singh, A., Singh, A., & Pore, P. Self-medication (OTC) Drugs in Urban Slum Dwellers in Pune City, Maharashtra. *Indian Journal of Medical Research,* 8(1), 31-36.

Limaye, D., Saeed, F., Ahmad, M., Pitani, R. S., & Fortwengel, G. (2017). Self-medication practices among university students from Karachi, Pakistan. *International Journal of Community Medicine and Public Health*, 4(9), 3076-3081.

Nair, M. S., Rajmohanan, T. P., & Kumaran, J. (2013). Self medication practices of reproductive age group women in Thiruvananthapuram District, South India: A questionnaire-Based study. Journal of Pharmaceutical Sciences and Research, 5(11), 220.

Osemene, K. P., & Lamikanra, A. (2012). A study of the prevalence of self-medication practice among university students in Southwestern Nigeria. *Tropical Journal of Pharmaceutical Research*, 11(4), 683-689.

Pan, H., Cui, B., Zhang, D., Farrar, J., Law, F., & Ba-Thein, W. (2012). Prior knowledge, older age, and higher allowance are risk factors for self-medication with antibiotics among university students in southern China. *Public Library of Science*, 7(7), e41314.

Parmar, Z., Malhotra, S. D., & Patel, V. J. (2015). Prevalence and pattern of self-medication in elderly individuals. *International Journal of Basic and Clinical Pharmacology,* 4(6), 1095-9.

Patil, S. B., Vardhamane, S. H., Patil, B. V., Santoshkumar, J., Binjawadgi, A. S., & Kanaki, A. R. (2014). Self-medication practice and perceptions among undergraduate medical students: a cross-sectional study. *Journal of Clinical and Diagnostic Research*, 8(12), HC20 –HC23.

Rangari, G. M., Bhaisare, R. G., Korukonda, V., & Chaitanya, Y. L. (2020). Prevalence of self-medication in rural area of Andhra Pradesh. *Journal of Family Medicine and Primary Care*, 9(6), 2891-2898.

Shah, K., Halder, S., & Haider, S. S. (2021). Assessment of knowledge, perception, and awareness about self-medication practices among university students in Nepal. Heliyon, 7(1).

Shalini, A., & Logaraj, M. (2021). Prevalence and determinants of self medication use among the adult population residing in a sub urban areas near Chennai, Tamil Nadu. *Journal of Family Medicine and Primary Care*, 10(5), 1835-1838.

Sridhar, S. B., Shariff, A., Dallah, L., Anas, D., Ayman, M., & Rao, P. G. (2018). Assessment of nature, reasons, and consequences of self-medication practice among general population of Ras Al-Khaimah, UAE. *International Journal of Applied and Basic Medical Research*, 8(1), 3-8.

Ullah, H., Khan, S. A., Ali, S., Karim, S., Baseer, A., Chohan, O., Hassan, S. M., Khan, K. M., & Murtaza, G. (2013). Evaluation of self-medication amongst university students in Abbottabad, Pakistan; prevalence, attitude and causes. *Acta Poloniae Pharmaceutica*, 70(5), 919–922.

Yamane, Taro. 1967. Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row.

Yousef, A. M. M., Al-Bakri, A. G., Bustanji, Y., & Wazaify, M. (2008). Self-medication patterns in Amman, Jordan. *Pharmacy World & Science*, 30(1), 24-30.

Zeru, N., Fetene, D., Geberu, D. M., Melesse, A. W., & Atnafu, A. (2020). Self-medication practice and associated factors among University of Gondar College of Medicine and Health Sciences Students: a cross-sectional study. *Patient Preference and Adherence*, 14, 1779-