Comparison of self-medication practices with analgesics among undergraduate medical and paramedical students of a tertiary care teaching institute in Central India – A questionnaire-based study

Chaitali Ashish Chindhalore, Ganesh Natthuji Dakhale, Akhil B Giradkar

Abstract:

CONTEXT: Inappropriate self-medication can increase chances of adverse drug reactions, disease aggravation, or drug interactions. Analgesics are most commonly used as self-medication.

AIMS: The aim of this study was to evaluate and compare analgesic self-medication practices among medical and paramedical undergraduate students of a tertiary care teaching institute in Central India.

MATERIALS AND METHODS: A cross-sectional, observational study was conducted in 216 undergraduate medical (MBBS and BDS) and paramedical (occupational therapy/physiotherapy and BSc nursing) students. A predesigned, self-developed, semi-structured questionnaire was used.

STATISTICAL ANALYSIS: The Chi-square test was used for testing statistical significance.

RESULTS: The overall prevalence of self-medication with analgesics was 83.33%. Self-medication was significantly high among medical students as compared to paramedical students ($P = 0.003$). Significantly more medical students were aware about adverse drug reactions of analgesics as compared to paramedical students ($P = 0.019$). The most common source of information about drugs was previous prescription (58.33%), followed by media including the Internet (53.70%). The most dominant symptom compelling self-medication was found to be muscular pain (42.12%), followed by headache (36.57%). 54.16% of the students revealed that self-medication provides quick relief from pain. The most commonly used analgesic was paracetamol (82.40%), followed by diclofenac (22.68%). A significant number of paramedical students do not know exactly what precautions should be taken while taking analgesics ($P = 0.002$).

CONCLUSIONS: Medical students are more indulged in self-medication practices with analgesics. Paramedical students need to be educated regarding safe use of analgesics.

Keywords:
Analgesics, medical students, nursing students, self-medication

Introduction

Self-medication practices are exceedingly common worldwide. The World Health Organization defines self-medication as “The selection and use of medicines/medicinal products including herbal and traditional products by individuals, to treat self-recognized illness or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring diseases or symptoms.”\(^{(1)}\) Simply, self-medication means the use of...
Chindhalore, et al.: Self-medication with analgesics among medical and paramedical students

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain acts as a warning signal against disturbances in the body and thus has a protective function. However, on many occasions, pain seems pointless, only contributing to the discomfort to the subject. As a symptom, pain demands instant relief, and in practice, its dramatic relief highly impresses a layman. Analgesics are the drugs which relieve pain without causing loss of consciousness. Analgesics are classified as opioids such as morphine and pethidine and nonopioids which include nonsteroidal anti-inflammatory agents such as aspirin, ibuprofen, and diclofenac.

Limited studies had reported the prevalence of analgesic self-medication, especially among the young population of India who are highly influenced by media advertisements and the Internet which promote self-medication. Especially, a very few comparative studies among medical and paramedical students are accessible. Inappropriate self-medication practices, especially among health science students, might be a possible risk for their future professionalism also as they may recommend patients and relatives to practice self-medication without seeking medical attention which may adversely affect quality care of the patients.

Hence, the present study was planned to evaluate and compare analgesic self-medication practices among medical and paramedical undergraduate students of a tertiary care teaching institute in Central India.

Materials and Methods

The present cross-sectional, observational study was carried out among 216 undergraduate medical and paramedical students of a tertiary care teaching institute. The study was conducted after approval from the Institutional Ethics Committee (No. 1819 EC/Pharmac/GMC/NGP dated June 20, 2019). A predesigned, self-developed, semi-structured questionnaire consisting of both open-ended and close-ended questions related to self-medication practices was used to collect the relevant information pertaining to the study variables. The questionnaire included items to capture information about demography, prevalence, practice, and knowledge related to self-medication. It includes questions related to practicing self-medication with analgesics, type, dosage form, and frequency of administration of analgesics. The questionnaire also sought information from students regarding awareness about adverse drug reactions, advantages, disadvantages of self-medication, and precautions to be followed. The questionnaire was distributed to the undergraduate 2nd-year students from MBBS, BDS, occupational therapy (OT)/physiotherapy (PT), and BSc nursing. Written informed consent was taken from the students after explaining them the nature and purpose of the study. Assurance had been given to the participants about maintaining the confidentiality of collected data and voluntariness for participation in the study. The study questionnaire was first pretested in 5 participants, and accordingly, the modified version of the questionnaire was distributed to the study groups. Appropriate instructions about filling the questionnaire were given. The data obtained were analyzed based on different parameters pertaining to self-medication practices among medical and paramedical students.

Statistical analysis

Data were expressed as count and percentage wherever applicable. The Chi-square test was used for testing statistical significance. $P < 0.05$ was considered to be statistically significant. GraphPad Prism software version 5.1 (GraphPad Software, San Diego, CA 92108) was used for statistical analysis.

Results

The questionnaire was circulated to 235 students of the 2nd year of various streams, of which 216 students filled the questionnaire completely giving a response rate of 92%. Thus, the data obtained from 216 students were analyzed. Of 216 students, 56 were from MBBS, 54 were from BDS, 53 were from OT/PT, and 53 were from BSc nursing. Therefore, data obtained from 110 medical students and 106 paramedical students were analyzed. Their demographic characteristics are mentioned in Table 1. The overall prevalence of self-medication with analgesics was 83.33%. Self-medication was significantly high among medical students as compared to paramedical students ($P = 0.003$). Majority of the students practice self-medication with analgesics at a frequency of once a month. Medical students have a significantly better idea about adverse drug reactions of analgesics as compared to paramedical students ($P = 0.019$). Evaluation of the questionnaire also revealed that the most common source
of information about drugs for these medical students was previous prescription (58.33%), followed by media including the Internet (53.70%) [Table 2]. Analgesics were preferred by most of the students for severe pain (45%), followed by moderate pain (30%) and mild pain (25%). The most dominant symptom compelling self-medication was found to be muscular pain (42.12%), followed by headache (36.57%) [Table 3]. Analgesics were preferred by most of the students for severe pain (45%), followed by moderate pain (30%) and mild pain (25%). The most dominant symptom compelling self-medication was found to be muscular pain (42.12%), followed by headache (36.57%) [Table 3]. When asked about the reason for opting self-medication, 54.16% revealed that self-medication provides quick relief from pain [Table 4].

Table 1: Demographic profile of study participants (n=216)

| Characteristic              | MBBS | BDS | OT/PT | BSc (nursing) | Total |
|----------------------------|------|-----|-------|---------------|-------|
| Gender                     |      |     |       |               |       |
| Male                       | 22   | 12  | 9     | 19            | 62 (28.7) |
| Female                     | 34   | 42  | 44    | 34            | 154 (71.3) |
| Age, mean±SD               | 20.25±0.87 | 20.52±1.03 | 20.54±1.47 | 19.62±1.15 | 20.23±1.20 |
| Residential status         |      |     |       |               |       |
| Hostel                     | 31   | 36  | 47    | 48            | 162 (75) |
| Home                       | 25   | 18  | 6     | 5             | 54 (25)  |

Table 2: Analysis of self-medication practices according to various parameters among medical and paramedical students in Central India (n=216)

| Parameter                                      | Medical students |         |                         | Paramedical students |         | Total, n (%) |
|------------------------------------------------|------------------|---------|-------------------------|-----------------------|---------|--------------|
| Practicing self-medication with analgesics     | MBBS | BDS | No | OT/PT | BSc (nursing) | No |             |
| Yearly                                         | 49   | 51  | 100** | 41 | 39 | 80 | 180 (83.33) |
| 6-7 times/year                                 | 5    | 10  | 15 | 21 | 8 | 29 | 44 (20.37) |
| Monthly                                        | 23   | 11  | 34 | 22 | 8 | 30 | 64 (29.62) |
| Weekly                                         | 6    | 7   | 13 | 9  | 5 | 14 | 27 (12.5)  |
| Daily/alternate day                            | 3    | 2   | 5  | 3  | 2 | 5  | 10 (4.62)  |
| Aware about adverse drug reactions of analgesics| 48   | 46  | 94* | 39 | 37 | 76 | 170 (78.70) |
| Source of information                          |      |     |     |     |    |    |             |
| Previous prescription                          | 29   | 31  | 60 | 36 | 30 | 66 | 126 (58.33) |
| Advertisement                                  | 15   | 28  | 43 | 37 | 36 | 73 | 116 (53.70) |
| Textbook                                       | 24   | 19  | 43 | 5  | 5 | 10 | 53 (24.53) |
| Other persons                                  | 4    | 3   | 7  | 2  | 2 | 4  | 11 (5.09)  |

Chi-square test; *P<0.05; **P<0.01. OT/PT=Occupational therapy/physiotherapy

Discussion

The present study was premeditated to compare the prevalence and pattern of analgesic self-medication among the undergraduate medical and paramedical students. Accordingly, this study gauged various aspects of self-medication among medical and paramedical students. In the present study, 83.33% of the students have used analgesics as self-medication. James et al. reported that 44.8% of the medical students practiced self-medication.[3] A comprehensive study conducted among medical, pharmacy, and health science students of a single medical college in Ethiopia revealed the prevalence of this practice to be 38.5%.[8] Analogous studies in India disclosed the prevalence of analgesic use ranging from 23% to 90%.[9‑11] This study result specifies that self-medication practices are more predominant in India. The likely reason might be easy availability of drugs from pharmacy coupled with inadequate health services, results in increased proportions of drugs being used as self-medication. Self-medication practices may vary from place to place and depend on social and cultural differences. Results may also vary because of different methodologies used in finding out the prevalence of self-medication.[12]

Self-medication practices do not vary according to gender which coincides with findings from another study also.[13] In contrast, few studies observed more prevalence rate among female students.[9] The present study findings demonstrated that significantly more medical students were indulged in self-medication practices with analgesic in comparison to paramedical students. This might be due to increased exposure of medical students to drug-related information and clinical subjects as compared to paramedical students.[14] In
contrast, in a study led by Johnson et al., the prevalence of self-medication is more among nursing students as compared to medical and pharmacy students.\textsuperscript{[15]} Frequency of taking analgesics is monthly in most of the students. However, Kasulkar and Gupta opined that most of the students self-medicated with analgesics on as and when required basis followed by once daily.\textsuperscript{[9]}

About source of information, majority of the students follow the previous prescription of a physician, followed by advertisement. These results showed that the young population including medical and paramedical students are highly inclined toward media. They rely on information provided by media either through advertisement or other means which is not always true. Instead of relying on textbook for drug information, students prefer media, which might be due to quick and easy access. This issue needs to be conversed among stakeholders. Dispersion of drug-related information through media and the Internet should be under strict regulations so that the common public do not get wrong information about drugs and should not be influenced by false high claims made by pharma industry regarding efficacy and safety of drugs. These study findings were supported by previous studies.\textsuperscript{[2,11,16]}

In contrast, some studies reported that the major source of information is textbook, followed by the Internet, old prescriptions, and media.\textsuperscript{[17]} The present study revealed that students mostly choose analgesics for muscular pain at any site, followed by:

### Table 3: Indications for the use of analgesics as a self-medication by medical and paramedical students in Central India (n=216)

| Indications      | Medical students | Paramedical students | Total, n (%) |
|------------------|------------------|----------------------|--------------|
|                  | MBBS | BDS | Total | OT/PT | BSc (nursing) | Total |
| Headache         | 16   | 24  | 40    | 22    | 17             | 39    | 79 (36.57) |
| Muscular pain    | 19   | 28  | 47    | 20    | 24             | 44    | 91 (42.12) |
| Abdominal pain   | 4    | 4   | 8     | 7     | 4              | 11    | 19 (8.79)  |
| Dysmenorrhea     | 4    | 7   | 11    | 5     | 2              | 7     | 18 (8.33)  |
| Toothache        | 3    | 5   | 8     | 3     | 2              | 5     | 13 (6.01)  |
| Fever            | 4    | 8   | 12    | 16    | 3              | 19    | 31 (14.35) |
| Cold and flu     | 5    | 8   | 13    | 7     | 5              | 12    | 25 (11.57) |

OT/PT=Occupational therapy/physiotherapy

### Table 4: Reasons stated by participants in favor of (advantages) and against (disadvantages) self-medication with analgesics (n=216)

| Reasons stated by the respondents | Medical students | Paramedical students | Total, n (%) |
|----------------------------------|------------------|----------------------|--------------|
| Quick relief                     | 27               | 25                   | 52           | 31             | 34             | 65             | 117 (54.16) |
| Time saving                      | 10               | 11                   | 21           | 12             | 9              | 21             | 42 (19.44)  |
| Cost-effective                   | 1                | 6                    | 7            | 1              | 1              | 2              | 9 (4.16)     |
| No need to consult physician     | 18               | 14                   | 32           | 38             | 35             | 73             | 105 (48.61) |
| Ease and convenience             | 25               | 17                   | 42           | 24             | 17             | 41             | 83 (38.42)  |
| Risk of adverse drug reactions   | 37               | 35                   | 72           | 28             | 33             | 61             | 133 (61.57) |
| Risk of drug dependence          | 3                | 1                    | 4            | 11             | 6              | 17             | 21 (9.72)   |
| Misuse/wrong use                 | 10               | 3                    | 13           | 3              | 4              | 7              | 20 (9.25)   |
| Risk of missing the diagnosis    | 15               | 4                    | 19           | 2              | 4              | 6              | 25 (11.57)  |
| Do not know                      | 5                | 4                    | 9            | 10             | 8              | 18             | 27 (12.5)   |

OT/PT=Occupational therapy/physiotherapy

### Table 5: Student’s opinion regarding precautions to be followed while using analgesics for self-medication (n=216)

| Precautions to be followed | Medical students | Paramedical students | n (%) |
|----------------------------|------------------|----------------------|-------|
|                            | MBBS | BDS | Total | OT/PT | Nursing | Total |
| Proper dose                | 25   | 21  | 46    | 15    | 21      | 36    | 82 (37.96) |
| Read instructions          | 16   | 10  | 26** | 2     | 8       | 10    | 36 (16.66) |
| Should be taken after meal | 25   | 11  | 36*** | 10    | 3       | 13    | 49 (22.68) |
| Check expiry               | 30   | 25  | 55*   | 23    | 12      | 35    | 90 (41.66) |
| Do not know                | 5    | 4   | 9     | 13    | 12      | 25**  | 34 (15.74) |

Chi-square test; *P<0.05; **P<0.01; ***P<0.001. OT/PT=Occupational therapy/physiotherapy
headache which is in accord with a previous study by Kandavalli et al.\cite{18} However, headache was the most common indication as reported by previous studies.\cite{17,19,20}

The participants had a fairly good knowledge of the advantages and disadvantages of self-medication. Most of them correctly perceived self-medication as a way of quick relief from pain and no need to consult a doctor along with time-saving and cost-effective strategy to get rid from pain. In a study by Mahmood et al., the most common reason for self-medication was quick relief as seen in 40% of the study population.\cite{21}

The most common reason for analgesic self-medication reported by students was the illness being too trivial.\cite{2} However, in one of the studies from India, most of the students practiced self-medication as it was time-saving.\cite{22} Hence, the study findings suggest a need for improvement of health services so that treatment becomes more accessible and the patient’s waiting time is minimized. Length of waiting time for medical consultation has been identified as one of the predictive factors for self-medication.\cite{23} Whereas, the most important restraints for self-medication were fear of adverse drug reactions, followed by risk of missing the diagnosis as taking analgesic provides only symptomatic relief. These findings are in accordance with an earlier study.\cite{3}

Paracetamol is most commonly taken analgesic by medical and paramedical students in the present study which is analogous to previous studies.\cite{2,3,17} Paracetamol is one of the most commonly used analgesic-antipyretic agents used with negligible anti-inflammatory action. Paracetamol relieves fever and pain by inhibiting cyclooxygenase-3 in central nervous system (CNS) which is involved in pain perception and fever but not in inflammation. Paracetamol is indicated for mild-to-moderate pain such as headache, myalgia, and postpartum pain. Because of its high safety profile, it comes in the category of over-the-counter medicines.\cite{24} However, a major group of students (22.68%) also self-administered diclofenac which is a matter of worry because, since diclofenac has a potential to cause hepatotoxicity as well as nephrotoxicity on chronic use.\cite{24} This issue needs to be addressed. Hence, in curriculum for undergraduates, emphasis should be given on rational use of medicine to avoid side effects. In the current study, the most frequently used dosage form is tablet, followed by capsule and topical dosage form which is in accord with similar studies in the past.\cite{18}

Participants prefer tablet more as it is cost-effective and compliance is better. Regarding precautions to be followed while using analgesics for self-medication, majority of the students rightly mentioned that one should check the expiry of medicine and correct dose to be administered which is a welcoming sign. These findings were supported by previous studies.\cite{9,25} However, when compared among groups, medical students had a significantly better idea about precautions such as reading the instructions, taking after meal, and checking expiry. The matter of concern is that a significant percentage of paramedical students do not know exact precautions to be followed while taking analgesics. This is dangerous for them and also for patients. Since paramedical staff come more in contact with patients and they play an important role in counseling of patients along with providing proper guidance regarding the administration of drugs, stress should be given to educate paramedical students regarding proper drug administration.

We admitted certain limitations of the present study. There is a probability of recall bias and mutual influence between the students while filling the questionnaire. Attitude of students toward self-medication was not tested as well.

To summarize, the current study indicates that although medical students are more indulged in self-medication practices with analgesics, at the same
time, they have better knowledge about certain aspects of self-medication with analgesics which reflects the influence of medical training. In case of paramedical students, their knowledge about analgesic use needs to be refined. Besides this, streamlining of drug-dispensing guidelines in order to control the dispensing of medicines without prescription across the pharmacies in the country can reduce self-medication practices substantially. Finally, to conclude, due to the high prevalence rate of self-medication practices, education of the youth to ensure safe medicine practices is the need of the hour.

**Conclusion**

Comparatively more Medical students are indulged in self-medication practices with analgesics but at the same time, they have better knowledge about certain aspects of self-medication with analgesics which reflects the influence of medical training. In case of paramedical students, their knowledge about analgesics use needs to be refined.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. World Health Organization. Guidelines for the Regulatory Assessment of Medicinal Products for use in Self-Medication. WHO Drug Informa 2000;14:18-26.
2. Shivamurthy S, Manchuconda R, Gurappanavar D. Evaluation of analgesic-self-medication pattern among under-graduate medical students of Adichunchanagiri Institute of Medical Sciences, BG Nagar, Karnataka: A cross-sectional questionnaire-based study. Int J Basic Clin Pharmacol 2015;4:438-41.
3. James H, Handu SS, AlKhaja KA, Otoom S, Sequeira RP. Evaluation of the knowledge, attitude and practice of self-medication among first-year medical students. Med Prin Pract 2006;15:270-5.
4. Sontakke SD, Bajait CS, Pimpalkhute SA, Jaiswal KM, Jaiswal SR. Comparative study of self medication practices in first and third year medical students. Int J Biol Med Res 2011;2:561-4.
5. Al Essa M, Alshehri A, Alzahrani M. Practices, awareness and attitudes toward self-medication of analgesics among health sciences students in Riyadh, Saudi Arabia. Saudi Pharma J 2019;27:235-9.
6. Satoskar RS, Rege NN, Bhandarkar SD, editors. Analgesic-antipyretics and nonsteroidal anti-inflammatory drugs (NSAIDs). In: Pharmacology and Pharmacotherapeutics. 24th ed. Mumbai: Elsevier; 2015.p. 258-9.
7. Montgomery AJ, Bradley C, Rochfort A, Panagopoulou E. A review of self-medication in physicians and medical students. Occup Med 2011;61:490-7.
8. Abay SM, Amelo W. Assessment of self-medication practices among medical, pharmacy, and health science students in Gondar University, Ethiopia. J Young Pharm 2010;2:306-10.
9. Kasulka AA, Gupta M. Self medication practices among medical students of a private institute. Indian J Pharm Sci 2015;77:178-82.
10. Banerjee J, Bhadury T. Self-medication practice among undergraduate medical students in a tertiary care medical college, West Bengal. J Postgrad Med 2012;58:127-31.
11. Kumar N, Kanchan T, Unnikrishnan B, Rekha T, Mithra P, Kulkarni V, et al. Perceptions and practices of self-medication among medical students in coastal South India. PLoS One 2013;8:e72247.
12. Ahmad A, Patel I, Mohanta G, Balkrishnan R. Evaluation of self medication practices in rural area of town Sahaswan at Northern India. Ann Med Health Sci Res 2014;4:573-8.
13. Ibrahim NK, Alamoudi BM, Baamer Wo, Al-Raddadi RM. Self-medication with analgesics among medical students and interns in King Abdulaziz University, Jeddah, Saudi Arabia. Pak J Med Sci 2015;31:14-8.
14. Kumar R, Goyal A, Padhy BM, Gupta YK. Self-medication practice and factors influencing it among medical and paramedical students in India: A two-period comparative cross-sectional study. J Nat Sci Biol Med 2016;7:143-8.
15. Johnson D, Sekhar HS, Alex T, Kumaraswamy M, Chopra RS. Self medication practice among medical, pharmacy and nursing students. Int J Pharm Pharm Sci 2016;8:443-7.
16. Kumari R, Kiran, Kumar D, Bahl R, Gupta R. Study of knowledge and practices of self-medication among medical students at Jammu. J Med Sci 2012;15:141-4.
17. Kumari K, Toppo MS, Priyanki M. Self-medication practices of over the counter analgesic drugs among medical students in a tertiary care hospital in Jharkhand, India. Int J Basic Clin Pharmaco 2019;8:903-9.
18. Kandavalli S, Subbaiah MV, Surokha M, Harini J, Sujana A, Sankar R. Assessment of self medication practices among community people. IOSR J Dent Med Sci 2017;16:75-82.
19. Kumar A, Vandana, Aslam AN. Analgesics self-medication among undergraduate students of a Rural Medical College. J Pharmacol Pharmaco 2016;7:182-3.
20. Sarahroodi S, Maleki-Jamshid A, Sawalha AF, Mikaili P, Safaeian L. Pattern of self-medication with analgesics among Iranian University students in central Iran. J Family Community Med 2012;19:125-9.
21. Mahmood AH, Zaka M, Siddiqui A. Misuse and dependence on nonprescription codeine analgesic or sedative H1 antihistamines by adults. EJPMR 2018;5:351-5.
22. Kayalvizhi S, Senapathi R. Evaluation of the perception, attitude and practice of self-medication among business students in 3 select cities, South India. Int J Enterp Innov Manage Stud 2010;1:40-4.
23. Martins AP, Miranda AC, Mendes Z, Soares MA, Ferreira P, Nogueira A. Self-medication in a Portuguese urban population: A prevalence study. Pharmacoeconomid Drug Saf 2002;11:409-14.
24. Sharma HL, Sharma KK, editors. Nonsteroidal anti-inflammatory agents, drugs for gout and antirheumatoid drugs. In: Principles of Pharmacology. 2nd ed. Hyderabad: Para; 2017. p. 371-89.
25. Patel PM, Prajapati AK, Ganguly B, Gajar BM. Study on impact of Pharmacology teaching on knowledge, attitude and practice on self-medication among medical students. Int J Med Sci Public Health 2013;2:181-6.