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# 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

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## 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

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## 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.”<sup>[1]</sup> Simply, self-medication means the use of

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medicine without consulting a doctor. Peoples opt for self-medication since it is cost-effective, especially for people who cannot afford the cost of clinical services. Studies have revealed that the increase in self-medication was due to a number of factors such as socioeconomic factors, lifestyle, ready access to drugs, increased awareness about self-care, and greater availability of medicinal products.<sup>[2]</sup> Inappropriate self-medication can increase chances of adverse drug reactions either due to the use of wrong medication or wrong dose or wrong indications at all. Self-medication also increases risk of disease aggravation and drug interactions.<sup>[3,4]</sup>

Analgesics are the most common groups of medications being taken as a self-medication for relieving pain of any kind.<sup>[5]</sup> 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.<sup>[6]</sup>

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.<sup>[7]</sup>

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 2<sup>nd</sup>-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 2<sup>nd</sup> 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]. When asked about the reason for opting self-medication, 54.16% revealed that self-medication provides quick relief from pain [Table 4]. Table 5 cites that medical students had a significantly better idea about precautions to be followed while taking analgesics. Figure 1 shows that the most commonly used analgesic for self-medication was paracetamol (82.40%), followed by diclofenac (22.68%). Tablet was the most commonly used dosage form for drug administration [Figure 2].

### 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.<sup>[3]</sup> 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%.<sup>[8]</sup> Analogous studies in India disclosed the prevalence of analgesic use ranging from 23% to 90%.<sup>[9-11]</sup> 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.<sup>[12]</sup>

Self-medication practices do not vary according to gender which coincides with findings from another study also.<sup>[13]</sup> In contrast, few studies observed more prevalence rate among female students.<sup>[9]</sup> 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.<sup>[14]</sup> In

**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)

Figure in bracket indicates percentage. OT/PT=Occupational therapy/physiotherapy, SD=Standard deviation

**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 (%)
	MBBS	BDS	No	OT/PT	BSc (nursing)	No	
Practicing self-medication with analgesics	49	51	100**	41	39	80	180 (83.33)
Frequency of self-medication with analgesics							
Yearly	5	10	15	21	8	29	44 (20.37)
6-7 times/year	6	8	14	4	11	15	29 (13.42)
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

**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 (%)
	MBBS	BDS	Total	OT/PT	BSc (nursing)	Total	
Reasons in favor of self-medication (advantages)							
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)
Reasons against self-medication (disadvantages)							
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

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.<sup>[15]</sup> 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.<sup>[9]</sup>

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.<sup>[2,11,16]</sup> In contrast, some studies reported that the major source of information is textbook, followed by the Internet, old prescriptions, and media.<sup>[17]</sup>

The present study revealed that students mostly choose analgesics for muscular pain at any site, followed by



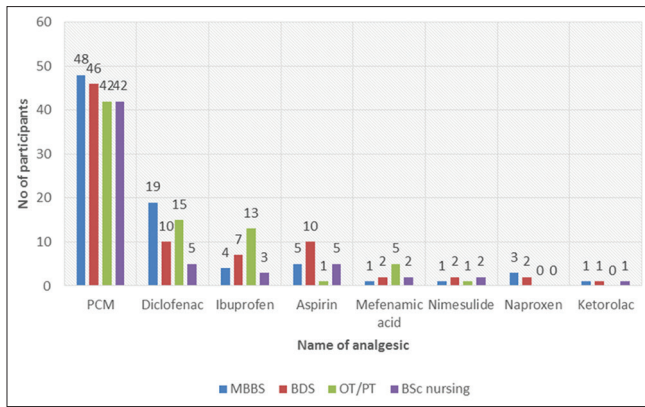


Figure 1: Analgesics preferred to be taken as a self-medication by medical and paramedical students (n = 216)

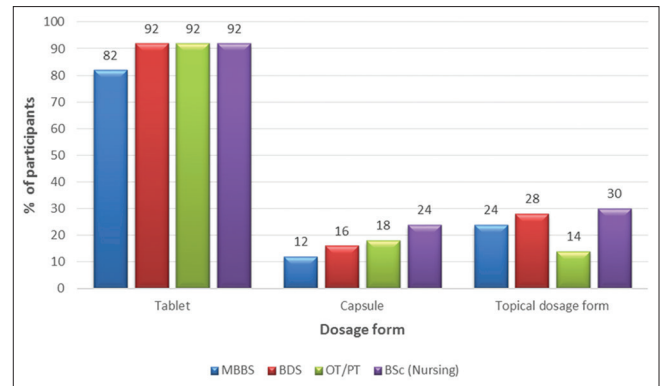


Figure 2: Dosage form preferred for self-medication with analgesics by medical and paramedical students (n = 216)

headache which is in accord with a previous study by Kandavalli *et al.*<sup>[18]</sup> However, headache was the most common indication as reported by previous studies.<sup>[17,19,20]</sup>

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.<sup>[21]</sup>

The most common reason for analgesic self-medication reported by students was the illness being too trivial.<sup>[2]</sup> However, in one of the studies from India, most of the students practiced self-medication as it was time-saving.<sup>[22]</sup> 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.<sup>[23]</sup> 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.<sup>[3]</sup>

Paracetamol is most commonly taken analgesic by medical and paramedical students in the present study which is analogous to previous studies.<sup>[2,3,17]</sup> 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.<sup>[24]</sup> 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.<sup>[24]</sup> 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.<sup>[18]</sup>

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.<sup>[9,25]</sup> 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.

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## Conflicts of interest

There are no conflicts of interest.

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