

Original Article

Knowledge and perceived confidence regarding the prescription of antibiotics and analgesics among dental students – An institutional-based study

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ABSTRACT

Objectives: In this study, the objective was to assess dental students' knowledge and perceived confidence in prescribing antibiotics and analgesics.

Material and Methods: A cross-sectional study was conducted on 320 undergraduate and post graduate students of a university dental school. A pre-validated, self-structured questionnaire consisting of 30 closed-ended questions about dental students' knowledge, practice, and confidence in prescribing antibiotics and analgesics was distributed to interns and third- and final-year graduate dentists via Google Forms. Pearson's chi-square test was used to analyze the data, and the results were calculated.

Results: A total of 300 dental students were enrolled in the study. Most of them were women trying to get their bachelor's degrees. Nearly 97% of them were aware of drug allergies, and 88% of them were aware of the emergence of antibiotic resistance. The most frequently reported mistakes by students were lack of knowledge of drug efficacy due to tablet size (only 35%) and color (only 13.5%). In spite of this, their knowledge and perception of their ability to prescribe drugs were adequate.

Conclusion: Among dental students, knowledge and confidence regarding prescribing the drug were statistically significant. The students were knowledgeable and level of confidence was good in drug prescription.

Keywords: Antibiotics, Analgesics, Dental students, Prescription

INTRODUCTION

Prescribing was a mandatory skill to be acquired by doctors in nearly all medical specialties.^[1] The wrong prescriptions could lead to a rise in medicolegal problems, aggravation or persistence of illness, unsuccessful treatment, suffering to the patient, and increased cost.^[2] A rational drug prescription refers to the use of the least number of drugs to achieve the best results in the shortest period of time and at the lowest cost possible.^[3-5]

Dental students studied pharmacology in their 2nd year and were exposed to clinical practice during their third and final years. They often prescribe drugs to the patient under the guidance of professors.^[1] The most commonly recommended drugs in dentistry were non-

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steroidal anti-inflammatory drugs, local anesthetics, and antibiotics.^[1] Consequently, it was imperative to possess precise information regarding the safe dosages of these medications and their adverse effects. Their lack of knowledge and confidence in their future dental practice will negatively impact their treatment outcomes and make them more likely to face medical and legal issues as a result. Hence, the medication practices occurring in the young population revealed the complex relationship with health, knowledge, and behavior that had to be considered to deliver safe and effective use of medication.^[6]

Prescribing errors are common worldwide. For example, repeated prescribing of antibiotics, which was widespread in Taiwan, often leads to microbial resistance and treatment failure, such as multidrug-resistant tuberculosis.^[7] There was evidence that dentists in Mexico and other countries frequently prescribe medications incorrectly as a result of a lack of precise pharmacological knowledge.^[5]

Thus, two-way dialog and appropriate questioning by medical experts aid in the establishment of treatment objectives and the detection of patient-related drug safety issues.^[8] Effective intervention, however, cannot be made without understanding dental student knowledge of and practices with medications. Numerous researches were conducted on medical students' prescription knowledge, despite the dearth of literature among dental students. Even if dental students were taught how to prescribe medication in their initial educational modules, their usage of recommending prescriptions in clinical departments needed to be reviewed, comprehended, and assessed. The study was conducted to evaluate the knowledge and perceived confidence of dental students in prescribing antibiotics and analgesics in light of this context.

MATERIAL AND METHODS

Study design, study area, and study population

A cross-sectional study involving 320 dental students took place in our institution between September 2021 and March 2022. Interns, undergraduates in their 3rd and 4th years of dentistry, and post-graduate students were all involved in the study.

Official permission, ethical approval, and informed consent

The study's methodology was fully disclosed to the participants and conducted with their consent after being reviewed by the institution's ethics committee and approved with registration number EC/2021/1108/CR/62.

Pretesting of questionnaire

The questionnaire's overall acceptability in terms of duration and voice intelligibility was tested in a pilot research with a sample of 30 students. We did not need to change the survey in response to their feedback.

Questionnaire

The study employed the same semi-structured pretested questionnaire that Doshi *et al.* had previously used.^[9] Written informed consent was provided by each participant in the study. The questionnaire's Cronbach's value of 0.80 indicated that it was considered internally reliable. It was found that the mean content validity ratio was 0.87. When the questionnaire's face validity was assessed, it was found that 92% of participants found it to be straightforward. General demographic data, such as gender, level of education, year of graduation, and specialization (for graduate students), were asked for in the first part. Eighteen closed-ended questions make up the second component, which assesses students' knowledge of generic medical concepts such as probable side effects, effectiveness, and how to use pharmaceuticals. The third component included 12 closed-ended questions that evaluated the drug-prescribing practices of dentistry students.

Methodology

The lists of participants, which included post-graduates and 3rd- and 4th-year dentistry undergraduate interns, were received from our college's administrative division. The estimated sample had 320 students selected by simple random sampling. Participants who wished to participate in the research were included in the study through informed consent. After filling out the informed consent form, almost 300 students agreed to participate in the study. The students were given the link to the Google Forms survey that included the informed consent attachment. The following steps for individuals who wanted to continue the research were to accept consent and complete the questionnaire. They were instructed to select the best response for each option. Students were informed that if they had any questions about the questionnaire, they could ask the examiner. To obtain a suitable response rate, the students were contacted 2–3 times. Every questionnaire was reviewed.

Statistical analysis

Spreadsheets were used to enter the data. The frequencies and percentage of the different variable categories were calculated. Data analysis was done using Pearson's Chi-square test because the data are categorical. Statistical significance was established at a P value of 0.05. The data were analyzed

using the Social Science Statistical Package version 21.0 (IBM Corporation, Armonk, NY).

RESULTS

The total number of participants was 300. Of these, 229 were female participants and 70 were male participants [Table 1]. Descriptive statistics showed the frequency and proportion of participants who responded about their knowledge and practice of prescribing antibiotics.

The results show that 210 (69%) participants responded that the same dosage of drug could be used for both children and adults [Table 2]. 269 (89%) participants responded that

unit dosage form affects efficacy. 291 (96%) participants said that certain drugs can cause side effects if used incorrectly. 242 (81%) participants responded that no drugs should be prescribed during pregnancy.

Table 3 shows that 278 (92%) participants often spend time carefully considering whether antibiotics are needed. 276 (91%) participants informed patients about possible side effects of the drug. 288 (95%) take history of drug allergy before prescribing drug.

DISCUSSION

The study's goal was to assess the institution's dental students' knowledge and perceived confidence regarding drug prescriptions. This study's objective was to present broad data regarding drug prescriptions among dental students.

Questionnaires were given to the pupils, and the results were assessed. According to the statistics, dentistry students have a good outlook but lack the knowledge and skills needed to take drugs safely. Ninety-seven percent of the students knew that allergies can result from some drugs. In contrast to the results of the study by Doshi *et al.*, most students stated that children and adults may take the same drugs.^[9] According to this study, the majority of students thought that some drugs were unsafe for kids to take and would trigger allergies.

Table 1: Demographic characteristics of study population.

Sample characteristics	Frequency (n %)
Total sample N	300 (100)
Gender	
Males	70 (23.3)
Females	229 (76.3)
Year of graduation	
UG (3 rd and 4 th years)	198 (65)
Interns	102 (33.7)
PG	2 (7)
UG: Undergraduate, PG: Post-graduate	

Table 2: Frequency of responses regarding the knowledge among the participants based on gender.

Sl.no	Question	Yes (%)	No (%)	Chi-square value	P-value
1	Some medicines may cause allergy	294 (97)	8 (3)	270.84	0.000***
2	Same medicines can be used in both children and adults.	210 (69)	92 (31)	46.106	0.000***
3	Some medicines are not suitable to be used by children	292 (96)	10 (4)	263.32	0.000***
4	Tablet size affects its efficacy.	108 (35)	194 (65)	24.490	0.000***
5	Unit dosage form affects its efficacy.	269 (89)	33 (11)	184.42	0.001***
6	Medicine's color affects its efficacy.	41 (13.5)	261 (86.4)	160.265	0.000***
7	Some medicines if used incorrectly can lead to adverse effects.	291 (96)	11 (4)	259.60	0.000***
8	The same medicine may be used to treat different illnesses	239 (79)	63 (21)	102.57	0.001***
9	Some medicines should be taken before or after food.	279 (92)	23 (8)	217.007	0.000***
10	Certain medicines have to be kept in the refrigerator	271 (89)	31 (11)	190.72	0.000***
11	Heat and direct sunlight damage medicines.	269 (89)	33 (11)	184.42	0.000***
12	Route for drug administration affects the effectiveness of medicine	278 (92)	24 (8)	213.6	0.000***
13	More dosage of drug should be prescribed in more pain	171 (56)	131 (44)	155.5	0.001***
14	Antibiotic resistance is the ability of microbes to resist the effect of drugs.	268 (88)	34 (12)	181.311	0.000***
15	Efficacy is better if the antibiotics are newer and more costly	102 (34)	200 (66)	31.801	0.000***
16	NSAID's cause GIT problems.	264 (87)	38 (13)	169.12	0.001***
17	No drug can be prescribed during pregnancy.	60 (19)	242 (81)	109.6	0.001***
18	Antacids should be added into all prescriptions to avoid GI upset.	175 (58)	127 (42)	7.629	0.001***

*** P<0.001. NSAID's: Non-steroidal anti-inflammatory drugs, GIT: Gastro intestinal tract, GI: Gastro intestinal

Table 3: Frequency of responses regarding the confidence among the participants based on gender.

Sl. No	Question	Yes (%)	No (%)	Chi-square value	P-value
1	I often prescribe antibiotics because the patient expects it.	60 (19)	241 (81)	108.84	0.000***
2	I often take time to consider carefully whether antibiotics are needed or not.	278 (92)	23 (8)	216.03	0.000***
3	I instruct the patient every time to complete the course of treatment with medicines even if they feel better	262 (86)	39	165.21	0.000***
4	I consider general factors (such as past drug history, systemic disease, and pregnancy) before prescribing any drug.	287 (95)	14 (5)	247.605	0.000***
5	I prescribe medicines only when indicated.	284 (94)	17 (6)	236.841	0.000***
6	I follow the rational prescription process	273 (90)	28 (10)	199.41	0.000***
7	I prescribe medicines by their generic name.	224 (74)	77 (26)	71.791	0.000***
8	I consider cost of the medicines before prescribing.	189 (62)	112 (38)	19.698	0.001***
9	While prescribing medicines, I take care of appropriate drug dosages.	281 (93)	20 (7)	226.316	0.000***
10	While prescribing, I take time to instruct the patient regarding the usage of medicines.	284 (94)	17 (6)	236.841	0.000***
11	I take history regarding drug allergy before prescribing medicines.	288 (95)	13 (5)	251.246	0.000***
12	I inform the patients about possible side effects of drugs.	276 (91)	25 (9)	209.306	0.000***

*** $P < 0.001$

Most pupils knew about side effects, storage, and route of administration. Human health is increasingly at risk from antibiotic resistance. In this study, nearly 88% of students knew about antibiotic resistance. In contrast, a study of medical graduates of medical school in Ireland found low awareness of antibiotic resistance among students.^[10] 13.5% respondents believed that color of the drug influenced its efficacy. Only 35% of respondents knew that size of the pill influenced its efficacy.

The results of the present study showed that most of them follow the ethical guidelines for prescription. Most of them often need time to properly assess whether antibiotics were necessary or not. A study conducted in medical schools in Saudi Arabia and Udaipur, India^[9] arrived a similar conclusion.^[11]

Ninety-five percent of students believed that doctors should consider common criteria such as the patient's history of adverse drug responses, systemic diseases, pregnancy or nursing history, and previous medication history before prescribing drugs. This implies that before issuing prescriptions, they underwent a rigorous training program.

Despite their limited participation, postgraduate dentistry students demonstrated much higher average knowledge than trainees and undergraduate students, according to the current study. This can be because graduate students continue their clinical training. This supports a study of Iranian medical schools that showed that students had only a limited understanding of antibiotics.^[12]

A limitation of the study includes a reduced sample size and restricted study population. The parameters were confined to antibiotics and analgesics. Other commonly prescribed

medications in dentistry including local anesthesia, corticosteroids, antifungals, and antivirals, were not included in the study. Similar studies with larger sample sizes in multispecialty health centers would throw light on the current scenario of drug prescription. This would provide accurate results and understanding of various prescribing patterns in a wider population.

Being confident while prescribing antibiotics and analgesics is a crucial component of dental education. Lack of confidence no longer equates to poor practice but it can still be a stressor that hinders scientific judgment and has a negative impact on the practice's routine.^[13] In addition to the prescribers, the patients are crucial in managing the antibiotic. Analgesic and antibiotic prescriptions may also be affected by the patients' knowledge, actions, and attitudes.^[14]

CONCLUSION

In the current study, it was discovered that many respondents had sufficient knowledge and experience, while only a small number had little or no trust in their ability to provide antibiotics and analgesics. A strong foundation in basic medical sciences is essential for developing the art of writing quality prescriptions. Continuing professional educational programs, use of innovative teaching methodology and extensive clinical governance by the faculties adequately trained in prescription writing would improve the quality of prescription writing among undergraduate students. This will have a positive impact in their clinical practice.

Ethical approval: The research/study approved by the Institutional Review Board at Sri Ramakrishna Dental College and Hospital,

Coimbatore, number EC/2021/1108/CR/62, dated 11th August 2021.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent.

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REFERENCES

- Guzmán-Álvarez R, Medeiros M, Lagunes LR, Campos-Sepúlveda AE. Knowledge of drug prescription in dentistry students. *Drug Healthc Patient Saf* 2012;4:55.
- de Vries TP, Henning RH, Hogerzeil HV, Fresle DA. Guide to good prescribing. A practical manual. World Health Organization action programme on essential drugs. WHO/DAP/94.11. Geneva: WHO; 1994. Available from: <https://iris.who.int/handle/10665/59001> [Last accessed 2012 Jan 06].
- Jain A, Gupta D, Singh D, Garg Y, Saxena A, Chaudhary H, *et al.* Knowledge regarding prescription of drugs among dental students: A descriptive study. *J Basic Clin Pharm* 2015;7:12-6.
- Jain A, Bhaskar DJ, Gupta D, Agali C. Dental hand for rural population: Teledentistry. *J Contemp Dent* 2014;4:27-9.
- Kia SJ, Behraves M, Sigaroudi AK. Evaluation of drug prescription pattern among general dental practitioners in Rasht, Iran. *J Dentomaxillofac Radiol Pathol Surg* 2013;1:18-23.
- Rauniar GP, Roy RK, Das BP, Bhandari G, Bhattacharya SK. Prescription writing skills of pre-clinical medical and dental undergraduate students. *JNMA J Nepal Med Assoc* 2008;47:197-200.
- Hsiao FY, Lee JA, Huang WF, Chen SM, Chen HY. Survey of medication knowledge and behaviors among college students in Taiwan. *Am J Pharm Educ* 2006;70:30.
- Espinosa-Melendez MT. An evaluation of the pharmacological knowledge of undergraduate and graduate students at UNAM's School of Dentistry. *Proc West Pharmacol Soc* 2006;49:173-6.
- Doshi A, Asawa K, Bhat N, Tak M, Dutta P, Bansal TK, *et al.* Knowledge and practices of Indian dental students regarding the prescription of antibiotics and analgesics. *Clujul Med* 2017;90:431-7.
- Jayadev M, Karunakar P, Vishwanath B, Chinmayi SS, Siddhartha P, Chaitanya B. Knowledge and pattern of antibiotic and non-narcotic analgesic prescription for pulpal and periapical pathologies-a survey among dentists. *J Clin Diagn Res* 2014;8:ZC10.
- Airaksinen M, Ahonen R, Enlund H. The "questions to ask about your medicines" campaign. An evaluation of pharmacists' and the public's response. *Med Care* 1998;36:422-7.
- Eldalo AS, Yousif MA, Abdallah MA. Saudi school students' knowledge, attitude and practice toward medicines. *Saudi Pharm J* 2014;22:213-8.
- Bajalan A, Bui T, Salvadori G, Marques D, Schumacher A, Rösing CK, *et al.* Awareness regarding antimicrobial resistance and confidence to prescribe antibiotics in dentistry: A cross-continental student survey. *Antimicrob Resist Infect Control* 2022;11:158.
- Alsayed AR, Darwish El Hajji F, Al-Najjar MA, Abazid H, Al-Dulaimi A. Patterns of antibiotic use, knowledge, and perceptions among different population categories: A comprehensive study based in Arabic countries. *Saudi Pharm J* 2022;30:317-28.

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