

EVALUATION OF KNOWLEDGE ABOUT DRUG PRESCRIPTION AMONG DENTAL STUDENTS; AN OBSERVATIONAL STUDY

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ABSTRACT

Introduction: *There is a lack of research regarding dentists' knowledge and their drug prescription practices, despite analgesics and antibiotics being frequently prescribed by dental practitioners. Prescription errors can be attributed to deficient training of dental students. This research was carried out to examine dental students' familiarity with common drugs and whether these future graduates would be proficient in drug prescription.*

Study design and setting: *Cross-sectional study carried out at Watim Dental College, Rawat in April, 2023.*

Methodology: *A questionnaire consisting of 10 close-ended questions was used in this study which was conducted among 180 students of Watim Dental College. The data was analyzed using spss 26 to produce descriptive statistics, contingency tables and to run chi-square test.*

Results: *The chief reason for prescribing medication was pain with Paracetamol being the most frequently recommended analgesic and Amoxicillin, the most commonly prescribed antibiotic. Not asking patients about drug allergies was the most common prescription error. The majority of the students used Pharmacology text books as a guide and were familiar with the WHO Guide to Good Prescribing. As the students entered their clinical years (third and final year), their drug knowledge improved which was statistically significant (p value=0.002)*

Conclusion: *The knowledge of pharmacology among students at Watim Dental College has gaps that could be a concern to the wellbeing of the patients. Whether this affects the success and safety of treatments needs to be evaluated by further studies. It is essential to develop strict therapeutic guidelines and to deliver pharmacological therapy courses to ensure accurate drug prescription practices.*

Keywords: *Drug Prescription, Dental Students, Pain-relievers, Antibiotics*

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INTRODUCTION

One of the fundamental tools that a dentist has to alleviate patient's symptoms is Drug Prescription.¹ Prescription is an individualized and dynamic act of

recommending drugs to be given or taken by the patient, their dosages and treatment duration. Despite being very beneficial to the patient, these potent drugs if given incorrectly, can cause severe adverse reactions.² There is a lack of awareness and understanding amongst junior dentists and dental students regarding two of the most frequently prescribed drugs; antibiotics and analgesics. The three most common prescription errors are: administering an incorrect drug, dosage strength or dosage forms; miscalculating a dose; and failing to identify drug interactions or contraindications.³

The undergraduate dental program at Watim Dental College takes four years. In second year, the students study Pharmacology including general pharmacology, chemotherapy, and specialized medical pharmacology. The students start with their clinical rotations in oral and maxillofacial surgery, operative

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dentistry and periodontology in third year therefore, they are frequently responsible for prescribing drugs to the patients. However, inappropriate prescribing practices by students may lead to failed treatment, exacerbation of symptoms, apprehension and monetary damage to the patient.⁴ A thorough understanding of pharmacokinetics, a good grasp on the principles of prescribing and therapeutics, and a familiarity with regularly used drugs is therefore indispensable for all dental graduates.

According to multiple researches, the prescription practices and skills of students and junior dentists are not up to par and their familiarity with and knowledge of medicines is often insufficient.⁵ Therefore, the aim of this study is to assess the prescribing skills of undergraduate students of bachelor of dental surgery (BDS) at Watim Dental College.

MATERIALS AND METHODS

This study was carried out on 180 dental students enrolled at Watim Dental College with the help of a specially prepared questionnaire adapted from the study of Ankita Jain. Ethical approval for this study was taken from the ethical approval committee, Watim Medical and Dental College and Hospital, Rawat. Inclusion criteria consisted of both male and female students of dental undergraduate program. Exclusion criteria involved house officers and post graduate trainees. A total of 180 students consented to take part in the study and returned the questionnaires. It consisted of 10 closed-ended questions on drug prescription intended to judge the awareness of the participants as regards to the various drug prescription practices and the most commonly used drugs in a dental setting. Data were expressed in terms of percentages. To analyze the data statistical package for social science (SPSS version 26) was used. To compare the knowledge between clinical and nonclinical groups Chi-square test was applied. The significance level was set at $p \leq 0.05$.

RESULTS

There was a total of 180 participants in this study, both male and female. All four academic years were included with first and second year falling in the non-clinical category and third and final year in the clinical category. The various demographic characteristics of the study population are shown in Table 1.

Table 2 specifies the responses to the survey questions. According to the students, the most common condition treated in clinical practice is dental pain with 148 (82.2%) opting this choice over infection (17.2%) or any other conditions (0.5%).

The analgesic most commonly prescribed is Paracetamol with 46.7% participants choosing this option

followed by Brufen (30%), Aspirin (15%), Diclofenac (6.1%), Naproxen (2.2%) and no one opted for Ketorolac.

The antibiotic that is most frequently prescribed by 153 of the dental students was Amoxicillin (85%) with 21 students (11.7%) choosing Penicillin V. Ampicillin, Clindamycin and other antibiotics were preferred with much less frequency; 1.7%, 1.1% and 0.6% respectively.

The most recurrent reported errors made by the students were: being unaware of the posology of the drug ($n = 29$, 16.1%); mistakes in filling out the prescription ($n = 37$, 20.6%); not knowing the brand names ($n=21$, 11.7%) and being unsure of the appropriate drug to advise ($n = 20$, 11.1%); being uninformed of the duration of the treatment ($n = 8$, 4.4%); not questioning the patient about possible allergies ($n= 62$, 34.4%); and not giving any prescription to the patient ($n = 3$, 1.7%).

Students use various sources to refer when prescribing drugs: Professors ($n = 55$, 30.6%), information from their pharmacology course ($n = 66$, 36.7%), a medical dictionary ($n = 26$, 14.4%), medical representatives from pharmaceutical companies ($n = 24$, 13.3%) and there were 8 (4.4%) students who gave no response.

The percentage of all correct answers given by the first year students was 5%, by second year students was 17.1%, by third year students was 25% and 33.3% of the final year students submitted all three correct responses. Hence, the number of correct responses increased by academic year and was statistically significant, p value 0.002. (Table 3)

DISCUSSION

New prescribers face great challenges when recommending drugs to patients due to the influx of numer-

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

Sample characteristics	Frequency n (%)
Gender	
Male	41 (22.8)
Female	139 (77.2)
Academic Year	
First	40 (22.2)
Second	41 (22.8)
Third	36 (20)
Final	63 (35)
Total	180 (100)
Clinical level	
Clinical	99 (55)
Non-clinical	81 (45)
Total	180 (100)

TABLE 2: PERCENTAGE RESPONSES GIVEN BY THE PARTICIPANTS

S.No	Question	Percentage	
1	What is the most common health condition treated in the dental office?	Infection	17.2%
		Pain	82.2%
		Others	0.6%
2	What is the most common analgesic prescribed?	Ibuprofen	30%
		Paracetamol	46.7%
		Ketorolac	0
		Naproxen	2.2%
		Diclofenac	6.1%
		Aspirin	15%
		Other	0
3	What are the most common antibiotics prescribed?	Amoxicillin	85%
		Ampicillin	1.7%
		Penicillin V	11.7%
		Clindamycin	1.1%
		Other	0.5%
		Other	0
4	What is the most common error during prescription?	Wrong posology	16.1%
		Prescriptions wrongly filled	20.6%
		Not knowing the brand names	11.7%
		Not knowing what to prescribe	11.1%
		Wrong treatment duration	4.4%
		Not asking patient about allergies	34.4%
		Not giving a prescription	1.7%
		Other	0
5	What are the sources of prescription information?	Professor	30.6%
		Pharmacology course	36.7%
		Prescription books	14.4%
		Medical representatives	13.3%
		No response	5%
6	Do you prefer using WHO guidelines before prescribing medications?	Yes	72.8%
		No	27.2%
7	Do you have knowledge about the dosage of drugs prescribed?	Yes	71.1%
		No	28.3%
8	Do you know the frequency of the drugs to be prescribed?	Yes	66.1%
		No	33.9%

9	Do you have the knowledge of duration for the drug to be prescribed?	Yes	72.2%
		No	27.8%
10	Do you have the knowledge about the route of administration of the drug being prescribed?	Yes	79.4%
		No	20.6%

TABLE 3: COMPARISON OF CORRECT RESPONSES GIVEN BY THE FOUR ACADEMIC YEARS

	Academic year of participant				p-value
	First year (n=40)	Second year (n=41)	Third year (n=36)	Final year (n=63)	
Number of correct answers	0	1(2.4%)	1(2.8%)	1(1.6%)	0.002
no correct answer					
1 correct answer	17(42.5%)	7(17.1%)	9(25%)	5(7.9%)	
2 correct answers	21(52.5%)	26(63.4%)	17(47.2%)	36(57.1%)	
3 correct answers	2(5%)	7(17.1%)	9(25%)	21(33.3%)	

ous new drugs in the market and patients practicing polypharmacy, especially the elderly.⁶ Many blame insufficient training during the undergraduate years leading to prescription errors.⁷

Present study was conducted amongst 180 dental undergraduate students to evaluate their awareness and practices of analgesics and antibiotic prescription. It presents an overall summary of medication prescription habits among dental students.

Our study showed that according to the students of Watim Dental College the most common health condition treated is odontogenic pain with 82% choosing this option as compared to 38% in the research done by Guzman in which infection was chosen by the majority (56%) of the participants.⁸ Anuj’s study showed a similar pattern with respondents choosing infection as the primary adverse condition (47.14%).⁹ Patients usually visit a dentist only when they are in pain although any signs or symptoms of infection should be aggressively treated as infection will eventually cause pain and distress to the patient.¹⁰

Dentists prescribe NSAIDS more frequently than Acetaminophen to alleviate pain since NSAIDS have a higher anti-inflammatory action.¹¹ This was confirmed in Hina’s research in which Brufen was chosen by the majority (51.8%) however, the students in our study chose Paracetamol (46.7%) as their first choice of drug.¹² Although not as effective, Paracetamol is considered extremely safe and the only drug that can be used in combination with other analgesics. Brufen came in second with 30% selecting this option. In contrast, Ankita’s study exhibited Diclofenac as the first choice (36.47%) which although is very effective in controlling

pain, is nephrotoxic, causes gastric irritation and also has a lower anti-inflammatory action than NSAIDS.¹³ Therefore, despite there being strong evidence of Brufen’s supremacy students were unaware of it.

Amoxicillin was the most frequently prescribed antibiotic (85%) in our study. Martin’s research showed similar results with all the respondents choosing Amoxicillin over other antibiotics and also 75.3% of Muzammil’s respondents were in favor of amoxicillin.^{14,15} This is the correct option as amoxicillin is the first choice of antibiotics in dentistry sine it has a broad spectrum and effective on both aerobes and anaerobes.¹⁶

The most common prescription error according to our study was not asking the patients about their drug allergies beforehand (34.4%). A similar observation was made by Shahroom in his research in which the highest percentage (26%) of the participants picked this error.¹⁷ This is in contrast to Anuj’s study in which prescribing the incorrect drug was the most common mistake with a 44.28% majority.⁹ Likewise, drug allergy information was taken by 97.2% of the respondents in Doshi’s study therefore not considered a major error.¹⁸ Prescription errors are common amongst students and new dentists as they have limited knowledge on drugs and are not been adequately trained during their undergraduate years. Drug reactions can cause severe complications and even a threat to the patient’s life.¹⁹

The main source of prescription information for Watim students are course books (36.7%) which contradicts to Guzman’s and Ankita’s study in which the Professors were consulted most of the times, 43.9% and 36.47% respectively.^{8,13} Both text books and taking advise from professors is good practice during early

years of dental practice.

Most of the respondents in our study preferred using WHO guidelines for prescribing medications (72.2%) which is opposite to Guzman's study in which majority did not refer to WHO guidelines (60.6%).⁸ Even in Ankita's study 57.65% of the participants had no knowledge of WHO guidelines.¹³ Twenty eight percent of the students admitted to being unaware of the drug dose required when prescribing drugs which is less than the 44.12% reported by Ankita.¹³ Regarding the frequency, duration and route of drug administration most of the students had this knowledge at 66%, 72.2% and 79.4% respectively. In Ankita's study similar results were reported with 59.4%, 60% and 65.8% positive responses to these variables.¹³

The present study revealed an improvement in the knowledge of commonly prescribed drugs as the students pass on to higher academic years from 5% correct responses to 33% correct responses. The first three questions of the survey were used to evaluate this knowledge; pain being the most common clinical complaint, Brufen and Amoxicillin the most effective analgesic and antibiotic, respectively. This improvement can be attributed to the start of the clinical rotations in third and final year which gives an opportunity to the students to use their theoretical knowledge in clinical situations.

In current times, it has become very challenging to be a good prescriber with new dental graduates unable to handle the pressures once they enter the practical field. This is due to the drastic changes in medical education with an overburdened curriculum leading to less focus on clinical pharmacology and inadequate clinical training.²⁰ It is very concerning that there is such an increase demand on new prescribers owing to the vast plethora of new drugs available in the market, a growing number of indications for medical therapy, many patients taking multiple complex drugs and an ageing population.³ Even though mistakes are unavoidable in these conditions, it is imperative for a health care provider to diminish the risk. The results of the study exhibited that in spite of having mediocre knowledge of drug prescription, the third and final year dental students displayed adequate prescription skills in their clinical practice. Nevertheless, subpar knowledge will cause inappropriate use of drugs which will have adverse consequences. Thus, the BDS curriculum must incorporate certain changes such as merging theoretical lectures with clinical sessions. In addition, contemporary teaching styles using issue-based learning, e-learning and hands on workshops are recommended.

This study allowed us to see the gaps in prescription writing with the aim of adopting appropriate policies to guarantee effective disease management and well-

being of the patients. This nature of research via a self-administered questionnaire, is heavily reliant on the participant's answers. Although the respondents were urged to fill the questionnaire independently, discussions amongst students and recall bias could not be excluded entirely. We suggest similar studies to be carried out in different dental institutes of the country to evaluate the knowledge and practices of prescription writing. By doing so, the essential alterations in the undergraduate curriculum for the betterment of the dental health care services can be put forward to the concerned authorities.

CONCLUSION

Undergraduate dental students should receive ongoing instruction on the rationale for prescribing medications for oral infections as they are responsible for drug prescription, as well as acquaintance to its practical use in dental college teaching clinics.

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