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# Identification Of Prescription Knowledge & Errors Among Clinical Dental Students: An Institutional Study

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## Abstract

Prescribing is the act of indicating one or more drugs to be administered to or taken by the patient, its dosage, and the duration of the treatment. The most prescribed drugs in dentistry are the local anesthetics used during dental procedures, antibiotics, and NSAIDs. Because of the characteristics of these drugs, it is important to determine accurate doses and be aware of any adverse or toxic effects. Hence the objective of the study was to know the clinical students prescription knowledge & errors in a teaching dental institute, Tumkur, Karnataka.

### Methodology

A cross sectional study was conducted among 95 clinical dental students of Sri Siddhartha Dental College, Tumkur. Participants were given prescription pads & asked to prescribe a drug. Later the prescriptions were collected & were evaluated by a WHOs structured evaluation performa containing 19 parameters. Data were further analyzed using Fischer exact test &p value 0.05 is considered to be statistically significant.

### Results

A total of 95 students (57 UG from 3rd& 4th BDS, 38 Interns) participated in the study. Most of them were females. Interns had greater medication prescription knowledge than others.

### Conclusion

UG students had lower knowledge about medication prescription as compared to Interns. Nevertheless, prescription practices of all the dental students were found inadequate.

**Keywords**

Analgesic & antibiotics, Dental students, Drug prescription, Errors in prescribing.

**Introduction**

Writing a prescription is both a science and an art.[1]With the recent notification of the government and the council, indeed many medical practitioners have been left confused on how to go about writing their prescriptions. Yet doctors also need to keep in mind that there are many essential, sometimes legal requirements that are mandated in a practitioner's prescription while undertaking this routine yet most significant task. While there are pointers for doctors to remember here and there, there are no set guidelines neither by government or any council for dental practitioners in India to follow.

The course of dentistry in India takes five years. In the third year, students will be taught pharmacology subject, focused on general pharmacology, chemotherapy, and specialized medical pharmacology, where they learn about medical and dental issues. Also during the third year, students begin their clinical practice, becoming more involved with patients in different clinical branches (oral surgery), and are regularly responsible for prescribing the drugs. At this stage, professors supervise the students as they are writing prescriptions.[2]

The most prescribed drugs in dentistry are the local anesthetics used during dental procedures, antibiotics, and NSAIDs.[3,4] Because of the characteristics of these drugs, it is important to determine accurate doses and be aware of any adverse or toxic effects.[5,6]

Prescribing is the act of indicating one or more drugs to be administered to or taken by the patient, its dosage, and the duration of the treatment. It is an individualized and dynamic clinical process.[7]The World Health Organization (WHO) recommends defining the patient's problem (diagnosis), specifying the therapeutic objective, and then, considering the different alternatives, choosing a treatment with proven efficacy and safety; prescribing as a customized process.[1] Treatment begins by providing the patient with clear information and instructions. After an appropriate interval, results are evaluated. If the problem has been resolved, treatment may be stopped. If the problem persists, each step should be reexamined.[1]

According to the World Health Organization(WHO)'s recommendations, prescriptions should identify the professional, the patient, and the mode of administration, as well as the medicine's pharmaceutical form, its dosage, frequency ofuse, duration of treatment together with patient guidance and information.[8] Extreme care should be taken to avoid errors in medical prescriptions as they may not only lead to difficulties and mistakes in dispensing medicines, but may also result in incorrect drug use that can make treatments ineffective or unsafe, which increases risks and healthcare costs1. Since the dental surgeon is aprescriber and needs to use medicines as part ofhis or her clinical dental practice, lack of adequate training for students is an important matterthat impacts directly on the quality of medical prescriptions provided.[5]

Dental prescriptions provide short-term treatment or treatment specifically for surgical procedures; nevertheless, dentists require knowledge about drugs and must follow the international rules for prescribing. There is evidence that in other countries, dentists often do not have the proper pharmacological knowledge, and therefore, sometimes make prescription errors.[5,9-12]

The objective of the present study was to assess the prescription knowledge and common errors made by clinical dental students.

**Methodology**

A cross sectional study was conducted among clinical dental students of Sri Siddhartha Dental College, Tumkur. A total of 95 students (57 UG from 3rd& 4th BDS, 38 Interns participated in the study. Participants were given prescription pads & asked to prescribe a drug. Later the prescriptions were collected & were evaluated by a structured evaluation proforma containing 19 parameters which was for prepared by referring to various national and international prescription formats. The proforma was then used to assess the quality of each prescription as follows (a) Patient's information: OP number, name, age, gender, address and contact number. (b) Doctors information: Full name, department name, qualification, contact details, date of prescription, superscription and signature. (c) Drug information: Name, strength, dosage form, dosage instruction, duration and total quantity. Scoring of each prescription was done at the end of the proforma according to following criteria: if the parameter was present it was counted as Yes (1) and if parameter was absent than it was counted as No (0). Thus overall 19 parameters were assessed and scored for each prescription. The maximum and minimum scoring was 19 and 0 respectively.

According to the scores obtained, prescriptions were divided into four different groups as follows:

Group A (Poor) - Score 1 to 5

Group B (Fair) - Score 6 to10

Group C (Moderate) - Score 11 to 15

Group D (Good) - Score 16 to 19

The prescriptions were scored and grouped by the investigator. The results obtained were tabulated and subsequently subjected to statistical tests. Fischer exact test was applied to compare the individual parameters among the two groups. $P< 0.05$ is considered as statistically significant.

**Results**

Analysis of quality of prescriptions was done by comparison with a standard format and dividing them into four groups as poor, fair, moderate and good depending upon the score obtained. The results showed that 0 (0%), 26 (27%), 67 (71%) and 2 (2%) prescriptions belonged to groups A, B, C and D respectively. (Graph 1)

In all the prescriptions, 19 parameters were checked for presence or absence. On analyzing patient's information 100% of the students have mentioned about name &age, whereas the parameters which were absent most commonly were address (79%) & patient contact number (62%).When the difference between UG students& interns were compared students recorded more parameters properly compared to interns & the difference was statistically significant.(Table 1)

In doctor's information, full name was written by most of the UG students (72%) compared to Interns (26%)& it was statistically significant. But, parameters like department name, their qualification & contact details were not recorded in any of the prescription whereas, signature & date of prescription was present in all. (Table 2)

On analyzing the drug information, grey area was found in many parameters like strength of the drug, dosage form, duration of the drug & total quantity of the drug. Though UG students were better than Interns, overall 76% didn't mention strength of the drug, 58%

didn't mention the dosage of the drug, duration of the drug was not mentioned in 85% of the prescription& 64% total quantity of the drug. The difference was statistically significant.

**Discussion**

Good quality medical prescribing is one indicator of healthcare service quality.[1] Prescribing a medication is one of the major quality of health care personnel which itself is a important art and science which includes theoretical, clinical as well as practical skills.[2,13] This art usually learnt during the academic course and with experiences it has to be improved with current situations/updates by the government. In this study dental clinical students were included to assess their art of prescription and the proforma was then used to assess the quality of each prescription included parameters such as; (a) Patient's information: OP number, name, age, gender, address and contact number. (b) Doctors information: Full name, department name, qualification, contact details, date of prescription, superscription and signature. (c) Drug information: Name, strength, dosage form, dosage instruction, duration and total quantity. [5,8,14-18]

**Patient's Information**

In the present study majority of the students mentioned patient name (95%) and op number (77%). But students ignored to record patient's age, gender, contact details such as address and their contact number. There was no statistical difference was present gender where majority of UG Students mentioned the gender of the patient compared to interns. Bangalorean dental students,[5] Nigeria teratiary care hospital students[17] also shown similar type of recording of patient information. This patient related information is important to assess drug dosage, avoidance of some drugs due to gender, follow up and record maintenance. These mistakes might be due to work overload or already information regarding contact details were in the op cards. In contrast to study, Barbar et al[18] study showed 87% prescription with patient name and age.

**Doctor's Information**

Doctor's information is important for patient as well as for pharmacist for further contact for spellings; other company drug; combinations or any clarification. Prescription without signature of the doctor is not valid and patient may not purchase those drugs which are banned over the counter. Current study showed that most of the prescription were lacking with many details of the doctor such as department name, contact details, superscription (29%) where as full name of the doctor, date of prescription and signatures were present in all the prescription. Similar findings were observered in Bangalorean study population where as majority of KLE dental student population had mentioned doctors name and contact details.[5]

**Drug Information**

Prescription of current study population was lacking in generic name of the drug, strength of the drug, dosage form, duration and total quantity of the drugs required. Drug information is essential for patient. Prescription of drugs should be as simple as possible for better understanding to the patient who is going to use those drugs.

Study observation were in concurrent with Bhosale Et al[19]study among 400 prescription and Sultana et al study.[20]Study by Tamuno I et al[21] revealed that 43% of drug prescription had mentioned generic names of the drugs whereas around 53% of presription were with generic names in Alagoa PJ et al study.[22]

**Quality Of Prescription**

Quality of prescription depends upon factors such as information regarding patient, doctor and drug on prescription sheet. Majority (72%) of study population had moderate quality of prescription and quality of prescription was good among undergraduate students compared to Interns and postgraduates. Similar finding were seen in other studies which might be due to undergraduates are under full observation of staff, each step will be monitored by the staff with their counter signatures on their worksheets whereas interns and postgraduates might be overconfident and neglected.[1-3,5] Nor S B S et al,[6] R Guzman A et al,[23] where as general practiotioners of Peshwar, Pakistan study showed poor quality of prescription.[24]Along with all these factors of prescription, many other factors should be taken into consideration such as legibility/understandable hand-writing, proper communication regarding usage of drugs and mentioning same thing in prescription so that patient can easily follow it.

**Limitation**

As sample size was less and more over only dental clinical students were included this knowledge will enrich our existing research base in most neglected domain of dental practice to combat medical errors . Hence further studies have to be conducted to among heterogeneous practioners to assess the quality of prescription.

**Conclusion**

Prescription knowledge was moderate among dental students & decreased as the duration increases which may cause medication errors in dentistry.Doctor and patients factors were found more common among undergraduate student. Hence to improve the quality, stress has to be given to this topic and in syllabus it should be made as a must know topic and further practical classes should be conducted in this topic too. Authorities like Dental Council of India (DCI) can recommend making necessary changes in the curriculum in order to benefit patients and overall public health. In hospitals a format has to-be generated either electronic or print version so that compulsory/ mandatory entering of factors related to drug, patient and doctor should be implemented to improve the quality of prescription. Continuing education programs has to be conducted to update the pattern of prescription or some mandatory factors to be mentioned.

**Recommendation**

Need Of The Hour is to promote rational drug prescribing practices by organising Educational intervention programs / refresher programs for students.

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**Graph 1:** Analysis of quality of prescription

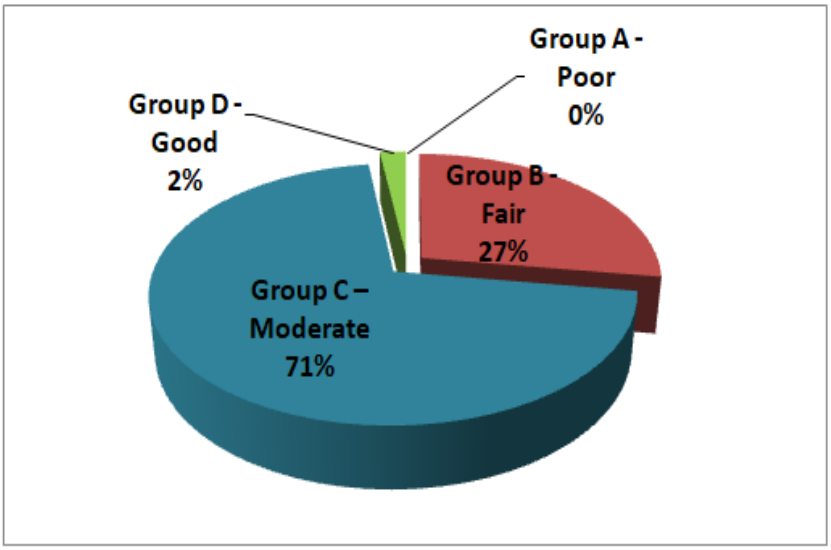


**Table1:** Comparison between patient's information parameters and qualification of students

| Parameter | Response | Student | | Total | Fischer exact test and p value |
|---|---|---|---|---|---|
| | | UG | Intern | | |
| Name | Present | 57(100.0%) | 38(100.0%) | 95 (100.0%) | - |
| | Absent | 0 | 0 | 0 | |
| Age | Present | 57(100.0%) | 38(100.0%) | 95 (100.0%) | - |
| | Absent | 0 | 0 | 0 | |
| Gender | Present | 33 (57.9%) | 11 (28.9%) | 44 (46.3%) | $\chi 2 = 7.68$ |
| | Absent | 24 (42.1%) | 27 (71.1%) | 51 (53.7%) | $p = 0.007$ S |
| Address | Present | 15 (26.3%) | 5 (13.2%) | 20 (21.1%) | $\chi 2 = 2.375$ |
| | Absent | 42 (73.7%) | 43 (86.8%) | 75 (78.9%) | $p = 0.198$ |
| Contact | Present | 19 (33.3%) | 17 (44.7%) | 36 (37.9%) | $\chi 2 = 1.260$ |
| | Absent | 38 (66.7%) | 21 (55.3%) | 59 (62.1%) | $p = 0.287$ |
| OP No | Present | 47 (82.5%) | 30 (78.9%) | 77 (81.1%) | $\chi 2 = 0.183$ |
| | Absent | 10 (17.5%) | 8 (21.1%) | 18 (18.9%) | $p = 0.790$ |

$p < 0.05$ Significant; $p < 0.001$ is Highly Significant

**Table 2:** Comparison between doctor's information parameters and the qualification of students

| Parameter | Response | Student | | Total | Fischer exact test and p value |
|---|---|---|---|---|---|
| | | UG | Intern | | |
| Full Name | Present | 41(71.9%) | 10 (26.3%) | 51(53.7%) | $\chi2 = 19.078$ |
| | Absent | 16(28.07%) | 28(73.7%) | 44(46.3%) | $p < 0.001$ HS |
| Department name | Present | 0 | 0 | 0 | - |
| | Absent | 57(100.0%) | 38(100.0%) | 95(100.0%) | |
| Qualification | Present | 0 | 0 | 0 | - |
| | Absent | 57(100.0%) | 38(100.0%) | 95(100.0%) | |
| Contact details | Present | 0 | 0 | 0 | - |
| | Absent | 57(100.0%) | 38(100.0%) | 95(100.0%) | |
| Date of prescription | Present | 57(100.0%) | 38(100.0%) | 95(100.0%) | - |
| | Absent | 0 | 0 | 0 | |
| Superscription | Present | 18(31.6%) | 11(28.9%) | 29(30.5%) | $\chi2 = 0.074$ |
| | Absent | 39(68.4%) | 27(71.1%) | 51(69.5%) | $p = 0.824$ |
| Signature | Present | 57(100.0%) | 38(100.0%) | 95(100.0%) | - |
| | Absent | 0 | 0 | 0 | |

$p < 0.05$ Significant; $p < 0.001$ is Highly Significant

**Table 3:** Comparison between drugs information parameters and the qualification of students

| Parameter | Response | Student | | Total | Fischer exact test and p value |
|---|---|---|---|---|---|
| | | UG | Intern | | |
| Name of drug | Present | 57(100.0%) | 38(100.0%) | 95(100.0%) | - |
| | Absent | 0 | 0 | 0 | |
| Strength of drug | Present | 21(36.8%) | 2(5.3%) | 23(24.2%) | $\chi2 = 12.391$ |
| | Absent | 36(63.2%) | 36(94.7%) | 72(75.8%) | $p < 0.001$ HS |
| Dosage form | Present | 32(56.1%) | 8(21.1%) | 40(42.1%) | $\chi2 = 11.515$ |
| | Absent | 25(43.9%) | 30(78.9%) | 55(57.9%) | $p < 0.001$ HS |
| Dosage instruction | Present | 57(100.0%) | 38(100.0%) | 95(100.0%) | - |
| | Absent | 0 | 0 | 0 | |
| Duration of drug | Present | 14(24.6%) | 0(0%) | 14(14.7%) | $\chi2 = 10.947$ |
| | Absent | 43(75.4%) | 38(100.0%) | 81(85.3%) | $p = 0.001$ HS |
| Total quantity of drug | Present | 27(47.4%) | 7(18.4%) | 34(35.8%) | $\chi2 = 8.314$ |
| | Absent | 30(52.6%) | 31(81.6%) | 61(64.2%) | $p = 0.005$ S |

$p < 0.05$ Significant; $p < 0.001$ is Highly Significant