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## Knowledge and Attitudes of Clinical Dental Students in University of Benin Teaching Hospital to Prescription of Drugs.

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### ABSTRACT

**Objectives:** Clinical dental Students often prescribe medications for conditions such as orofacial pain and infections. Thus, this study is aimed at the level of knowledge and attitude of University of Benin clinical dental students to prescription of drugs.

**Methods:** A descriptive cross-sectional study conducted among clinical dental students in the School of Dentistry, College of Medical Sciences, University of Benin, Benin City with a sample size of ninety-three. Data were collected using a self-administered questionnaire. Significant value was set at  $P \leq 0.5$

**Results:** The age of the respondents ranged from 18 to 33 years with a mean age of  $24.34 \pm 3.5$ . A higher proportion of the respondents were male (50; 53.8%), majority were 600 level clinical dental students (36; 38.7%). The most common health condition treated in dental clinic was pain (n = 70, 75.3%); the most used painkillers were ibuprofen (n = 54, 58.1%), followed by paracetamol (n = 29, 31.2%). The most widely prescribed antibiotics were amoxicillin (n = 67, 72.0%) and ampicillin (n = 22, 23.7%). The most frequent errors reported by students were: lack of knowledge about drug posology (n = 32, 34.4%), improperly filled prescriptions (n = 28, 30.1%) and not knowing the brand names (n = 10, 10.8%). Most students get their information for prescribing drugs from their consultants (n = 30, 32.3%), registrars (n = 16, 17.2%), pharmacology books (n = 4, 4.3%). Only 29 students (31.2%) followed the WHO Guide to Good Prescribing.

**Conclusion:** The findings from our study point to a deficiency in the dental students' curriculum with regard to prescription of drugs. The knowledge of prescribing drugs is of utmost need for good dental practice and hence, it is essential to expand the knowledge related to pharmacological therapy and to know about the proper therapeutic guidelines.

**KEYWORDS:** Knowledge, Prescription, Drug, Clinical Dental students, Attitude.

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**INTRODUCTION:** Clinical dental Students attend to patients with illnesses, and often prescribe medication in the management of patients with condition such as orofacial pain and infections. In dentistry, drugs are often prescribed to relieve pain and remove infections. Therefore, wrong prescription can lead to a range of problems including lack of pain control, antimicrobial treatment failure, and the development of resistance to antibiotics.<sup>1</sup> Drugs are an integral part of the health care system and have a vital role in maintaining human health and saving mankind.<sup>2</sup>

A sound knowledge of pathophysiology of a disease and clinical pharmacology and therapeutics of a drug is required for safe and rational prescribing.<sup>3</sup> The Medical and Dental Council of Nigeria (MDCN) is responsible for the design and regulation of undergraduate medical education in Nigeria (MDCN, 1993). The council has recommended that undergraduate pharmacology course should include topics in basic and clinical pharmacology, as well as therapeutics. Drug therapy is the main tool that doctors have for influencing the health of their patients. As these drugs can offer great benefits to patients, they can also cause great harm.<sup>3</sup> Prescriptions can also be used as a measure of the quality of medical education, observance of the laws and regulations, and sociocultural beliefs.<sup>4, 5, 6</sup> All the interaction of the doctor-patient communication comes to an end with proper prescription writing.<sup>7, 8</sup> Rational prescribing problems in the healthcare system is an overall problem that in addition to developing countries, in developed countries are also observed.<sup>9, 10</sup>

It is important for the health science students such as medical, dental, pharmacy, and nursing students to have knowledge and attitudes toward medication used to maintain the safety of the patient.<sup>11</sup> Customary, University of Benin dental students take basic pharmacology courses from fourth year that teach the pharmacokinetics and pharmacodynamics knowledge needed to understand pharmacotherapy. However, a true understanding of the context in which medications are prescribed comes in daily clinical

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practice and is not incorporated into basic pharmacology coursework. In general, students learn through observing their teachers and more experienced colleagues, acquiring practice in prescribing as they progress in their programs.<sup>12,13</sup>

Globally, prescribing-related errors are common.<sup>14</sup> and have resulted in a significant patient morbidity and mortality.<sup>15</sup> There are very few studies in the literature concerning prescription errors in Dentistry particularly by undergraduates.<sup>16,17</sup> Moreover, the lack of training in prescription and management of drug interactions has precipitated issues with identifying patients' problems and the therapeutic objective.<sup>18</sup>

The most common reasons for errors include failure to communicate drug orders, illegible handwriting, wrong drug selection, confusion over similarly named drugs, confusion over similar packaging between products, or errors involving dosing units or weight.<sup>19,20,21,22,23</sup> Prescribing error contributes significantly towards adverse drug events.<sup>24</sup>

The factors contributing to prescribing errors are extremely complex and include; characteristics of the clinical environment, prescribing culture, and workload, time, and support. However, at an individual level, prescribing errors are attributable to a lack of training in practical prescribing and failure to link theory and practice. This situation directs attention to the current undergraduate curriculum, which does not appear to be preparing trainee doctors as well as it should be<sup>25</sup>.

Knowledge of good prescription writing is of prime importance to any medical professionals irrespective of their qualification. Clinical students and interns should be periodically assessed on prescribing knowledge and skills during their training as a means of minimizing prescribing errors.

Each year, in the United States alone, 7,000 to 9,000 people die due to a medication error. The total cost of looking after patients with medication-associated errors exceeds \$40 billion each year, with over 7 million patients affected. Finally, a major consequence of medication errors is that it leads to decreased patient's satisfaction and a growing lack of trust in the healthcare system.<sup>21</sup>

The most authentic and gold standard in writing a prescription is to follow the guidelines of WHO for training dentists.<sup>8</sup> The most prescribed drugs in dentistry are the local anesthetics used during dental procedures, non-steroidal anti-inflammatory drugs (NSAIDs) and antibiotics. Because of the characteristics of these drugs, it is important to determine accurate doses and be aware of any adverse or toxic effects.<sup>26</sup>

Drugs may cause harm to the patient if not prescribed properly. Thus, knowledge of Pharmacology is one of the most important components of undergraduate teaching curriculum where students learn about the art of prescription writing and different drug formulations. Hence, the present study was undertaken to assess the prescribing skills of clinical dental students in University of Benin as the students start their clinical work.

## **METHODOLOGY**

### **Study Design**

This was a descriptive cross-sectional study conducted among clinical dental students in the School of Dentistry, College of Medical Sciences, University of Benin, Benin City, Nigeria.

This study involved all clinical dental students (levels 400 to 600) in the School of Dentistry, College of Medical Sciences, University of Benin, between June 2021 and January 2022. The inclusion criteria involved all clinical dental undergraduate students in the University of Benin who voluntarily decided to partake in the study.

### **Method of Data Collection and Tool**

Data were collected using a self-administered questionnaire. The study questionnaires were distributed to the students who made the study participants after their morning lecture sessions before they proceeded to their clinical postings and some others at their hostels. The purpose of the questionnaire was explained by the principal investigator and its anonymous nature was emphasized. The questionnaire was divided into three main sections namely: Socio-demographic characteristics of the respondents; Self-assessed knowledge of prescription of drugs among the respondents which had a 'yes' or 'no' or 'not sure' responses; Self-evaluation on prescription of drugs and clinical scenarios that assessed the attitude of the respondents about prescription of drugs with best option responses. In assessing knowledge, one score was assigned for the correct option as 1 and a score of 0 was given for wrong responses. For the 12 questions, the minimum and maximum possible scores were 0 and 12, respectively, which were graded as <5 as poor, 5-9 as fair and >9 as good. Ten questions were used to assess the self-assessed attitude of the respondents, and using the mean value for dichotomy, scores  $\leq 5$  were rated as poor and scores  $\geq 6$  were rated as good.

### **Sample Size Calculation**

The minimum sample size for this study was calculated using the Cochran formula for sample size determination:<sup>27</sup>

$$n = Z^2 pq / d^2$$

where:

n= minimum sample size

z= standard normal deviate set at 1.96 (at 95% confidence interval)

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p= prevalence value (proportion of a particular characteristic in a study)

q= 1-p (0.06)

d= degree of accuracy which was 0.05 for this study

Thus

p= prevalence n value=0.06; according to a study on how Dutch dental students and dental-care providers competent prescribers of.<sup>28</sup>

q=1-0.06= 0.94

Substituting for the above equation:

n=  $1.94 \times 1.94 \times 0.06 \times 0.94 / 0.0025 = 84.91$

Assuming an attrition of 10% =  $10/100 \times 84.91 = 8.491$

Thus, for this study, sample size will be  $84.91 + 8.491 = 93$

### Data Analysis

The data collected were tabulated and analyzed using the Statistical Package for the Social Sciences for Windows (version 25, Chicago, IL, USA) statistical software package. The results were expressed in terms of proportion and percentages while the Chi-square was used as test of association. Differences and associations were considered statistically significant where the associated  $P \leq 0.05$

## RESULTS

**Socio-Demographic Characteristics of Respondents:** A total of 93; 400 level, 500 level and 600 level clinical dental students participated in the study. The age of the respondents ranged from 18 to 33 years with a mean age of  $24.34 \pm 3.5$ . Most of the respondents were within ages 21-25 years (n= 48, 51.7%). A higher proportion of the respondents were male (50; 53.8%), majority were 600 level clinical dental students (36; 38.7%), and (30; 32.3%) were of the Bini ethnic group, and the religion of the respondents were all Christians (93; 100.0%) [Table 1].

**Self-Assessed Knowledge of Prescription of Drug:** Concerning the attendance of lectures or training on drug prescription, 65.6% affirmed they have, while 33.3% of the students have not attended lectures or training on drug prescription. About 98.9% said there is need to have knowledge about prescription of drugs, 48.4% of the students said they know how to write a prescription, while 38.7% of the students said they do not know how to write a prescription and 12.9% of student were not sure they know how to write a prescription. Only 37.6% were sure they can write a prescription effectively, while 44.1% cannot effectively write a prescription. Moreover, 31.2% answered that they know about the book WHO guide for good prescription. [Table 2]

In general, 44.1% of the participants had good knowledge, 33.3% had fair knowledge and 22.6% had poor knowledge of drug prescription (Figure 1).

### Most Common Health Conditions and Prescriptions in Dental Practice

To this question majority of respondents answered pain (75.3%) as the main reason for prescribing medication followed by infection (24.7%) [Figure 2].

The most common NSAIDS prescribed by clinical dental students of University of Benin was Ibuprofen. More than half of the respondents (58.1%) chose ibuprofen. The most common antibiotic prescribed was amoxicillin (72.0%). [Table 3] [Figure 2].

### Most common errors during prescription and source of Prescription information

The most common error during prescription among the clinical dental students was wrong posology (34.4%). Prescription wrongly filled (30.1%) was the closest common error to wrong posology [Figure 3]. The highest source of prescription information by clinical dental students of University of Benin was from the consultant (32.3%). Pharmacology course (23.7%) was the second highest source of prescription information. [Figure 4].

**Self-Reported Attitude About Prescription of Drugs:** About 54.8% of the students said they fill all necessary patient's details, while 34.4% of the students said they do not fill all necessary patient's details. Approximately 60% of the students said they enquire about past medical history before prescribing drugs, while 32.3% of the students said they do not enquire about past medical history before prescribing drugs. Also, 53.8% of the students said they obtain or have access to the vital medical signs before commencing treatment. Among the respondents, 45.2% of them reported they prescribe drugs with generic name [Table 4]. In general, 63.4% of the participants had good attitude, 36.6% had poor attitude about prescription of drugs (Figure 5).

Considering the association between knowledge of prescription of drugs and selected sociodemographic, the male gender (60.0%) and 600 level clinical students (75.0%) have good knowledge of prescription (Table 5). Observing the association between knowledge and attitude toward prescription of drugs, the respondents with good knowledge (67.8%) had good attitude to drug prescription (Table 6).

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### DISCUSSION

As recommended by the World Health Organization, each prescription should contain information such as the identity of the clinician and the patient, the method of administration, pharmaceutical form, its dosage, frequency, duration of treatment and advice to patients.<sup>12</sup> Correct prescription is important because the United States alone, approximately 200 thousand people die from drug use of which 100 thousand is due to the excessive use or use of the drug is contraindicated in patients.<sup>29</sup>

In Nigeria, the students take pharmacology courses in the 4th year which covers prescription writing and knowledge about all aspects of drugs. It is important to develop the awareness of the drug prescription at the earliest before they enter their clinical years.<sup>30, 31</sup>

In this study, the source of drugs prescription information is pharmacology course. A true understanding of the context in which medications are prescribed comes in daily clinical practice and is an important part in the training of clinical dental students into evolving into competent clinicians. In a study carried out among 170 male and female, third year and final year dental students in India,<sup>31</sup> Pain was found to be the most important reason for prescribing medication; this result is similar to that obtained in this study in which 75.3% of student said pain is the most common health conditions treated in dental practice. Toothache was the most common reason why dental patients take self-medication instead of seeing the dentist for treatment.<sup>32</sup>

Based on this study, the most prescribed antibiotic among dental students was amoxicillin which has a similar result with previous studies.<sup>26,32,34,35</sup> However, unnecessary prescription of antibiotics should be avoided as it may increase bacterial resistance.<sup>36, 33, 37</sup> Infection should always be treated as it leads to pain. To know the nature, type and the origin of the pain, proper diagnostic procedure should be used so that appropriate treatment can be implemented.

In another study carried out in the dental clinic of a teaching hospital, in Nigeria,<sup>19</sup> Antimicrobials (65.5%) and analgesics (34.5%) were the two drug classes mostly prescribed. This is similar to the findings in the present study. Majority of students have the habit of prescribing diclofenac and paracetamol (58.1% and 31.2%) respectively, which is in contrast with the previous studies in which ibuprofen was prescribed by maximum students.<sup>26</sup>

Wrong drug posology (34.4%) was the most frequent prescription error done by students in this study, which is similar to that obtained in a previous study.<sup>31</sup> This is a major concern, in view of the fact that it affects patient health and safety. While not knowing what to prescribe, not knowing brand names, improperly filled out prescriptions were found to be 16.1%, 10.8% and 30.1% respectively of the common errors during prescription writing as reported by respondents. These are common problems, and in addition can compromise patient safety. Without asking about patients' allergies, wrong duration of administration will unquestionably lead to therapeutic failure and this could worsen the patient's condition and may result in toxicity.<sup>38</sup>

The WHO Guide to Good Prescribing recommends making a customized list including the essential drugs for each healthcare professional who prescribes drugs at the clinic; to avoid the problem of not knowing brand names and provides step by step guidance to the process of reasonable prescribing, together with many illustrative examples. About 57.0% of students were not familiar with the WHO guidelines for prescribing, while 31.2% follow the indications whilst prescribing which is similar to previous study by<sup>31</sup> in which clinical dental students had limited knowledge of the WHO Guide to good prescribing. Also, in this study, most of the clinical dental students (32.3%) gather their information for prescribing from their consultants which is in disagreement with previous study;<sup>39</sup> in which majority (32%) of the students gather their information for prescribing from their pharmacology course. To acquire information from consultant is good as this is stage of the student's development. Approximately 1.1% students rely on their classmates for advice, which is less than in previous study,<sup>31</sup> in which 18.23% rely on their classmates for advice.

For the knowledge about dose of drug prescribed in this study, 63.4% students knew about the dose to be given to the patient, 24.7% did not know, and 11.8% students were not sure if they have knowledge about dose of drug prescribed. These results are better than those obtained previously.<sup>39</sup> WHO has recommended guidelines on drug prescription which should include the identity of the clinician and patient, method of administration, pharmaceutical form, its dosage, frequency, duration of the treatment, and advices to patients.<sup>1, 28</sup> Emergencies during medical and dental treatment may arise due to wrong prescriptions. Therefore, various programs on handling medical emergencies can be established to improve the knowledge and skills of the students such as workshops and assessment on practical skill.<sup>40</sup>

The male gender and the 600-level clinical dental students have good knowledge when compared with the female students and those in lower levels. This is expected because there is more exposure time to clinical training for the 600 level students than those in 400 and 500 levels. This trend was observed in a previous study<sup>27</sup> in which female students had significantly less knowledge of drug prescription. In addition, fifth-level students reported significantly fewer errors in writing a drug prescription than fourth-level students, and the interns showed fewer errors than their undergraduate colleagues.<sup>27</sup>

Observing the association between knowledge and attitude toward prescription of drugs, the respondents with good knowledge (67.8%) had good attitude to drug prescription. This demonstrates that knowledge when applied translates to good attitude in practice.

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Our study had some limitations, the sample size was small, and there was no known similar study in this region. Future studies with larger sample size have to be done to know the overall prescription writing skills of the students.

### CONCLUSION

Only 37.6% were sure they can write a prescription effectively, while 44.1% cannot effectively write a prescription. This should raise a serious concern because wrong prescription can cause health hazard and lead to drug resistance amongst other things. Also, the greatest source of information in the present study was from consultants. There should be upward regulation of the curriculum of undergraduate clinical dental students with more time allowed in the clinics to allow for training of clinical undergraduate dental students by consultants.

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FIGURES

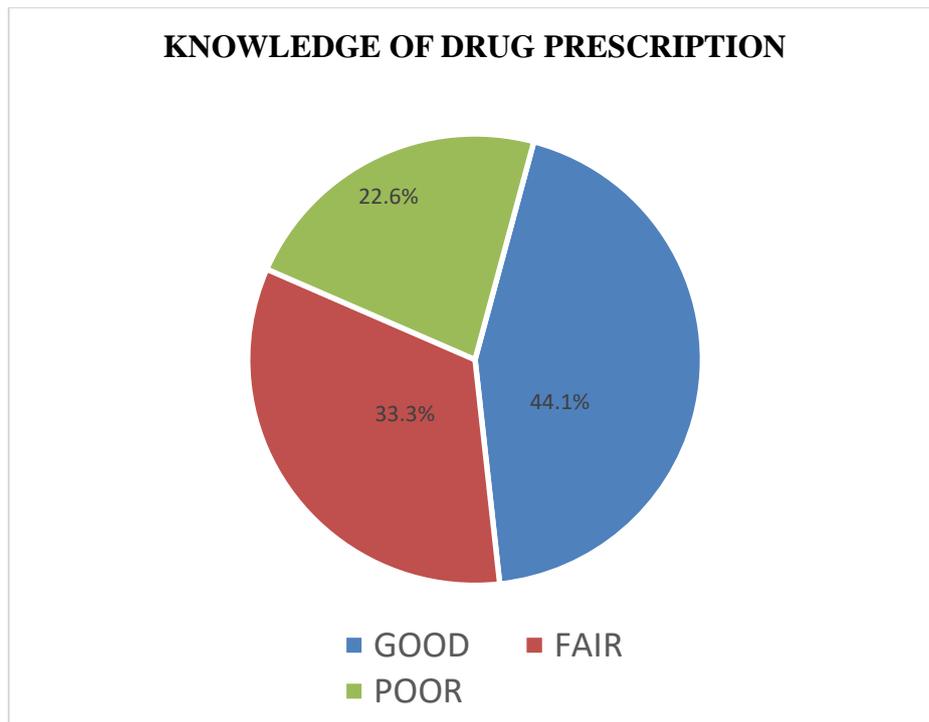


Figure 1: Grouping of Self-assessed knowledge of prescription of drugs.

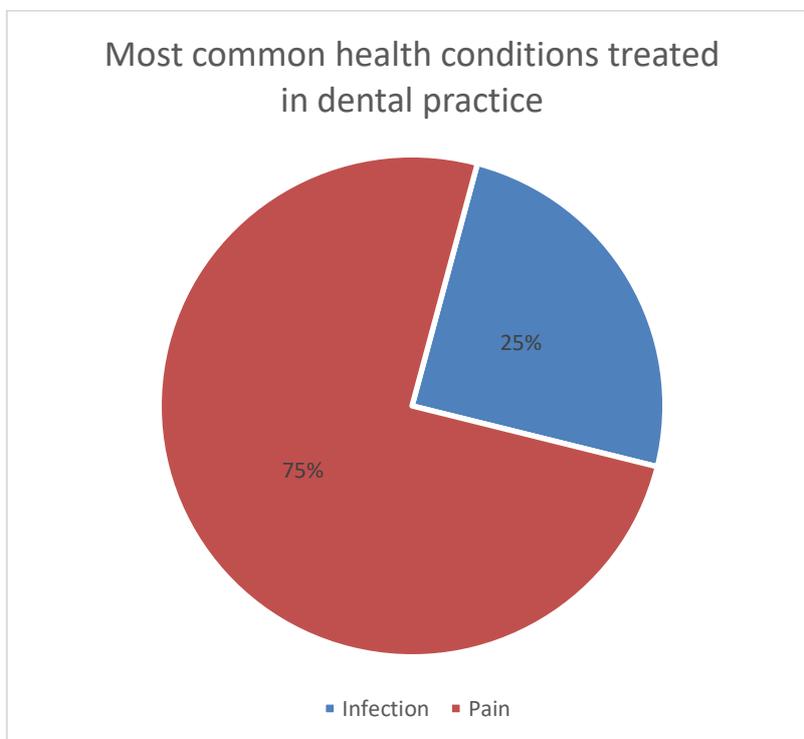
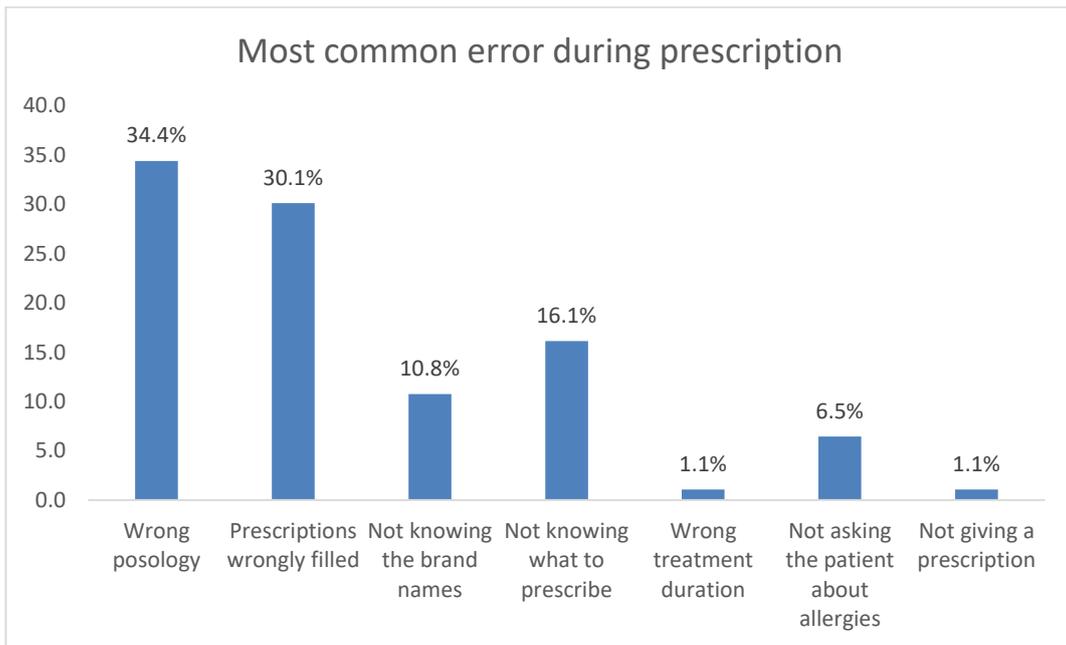
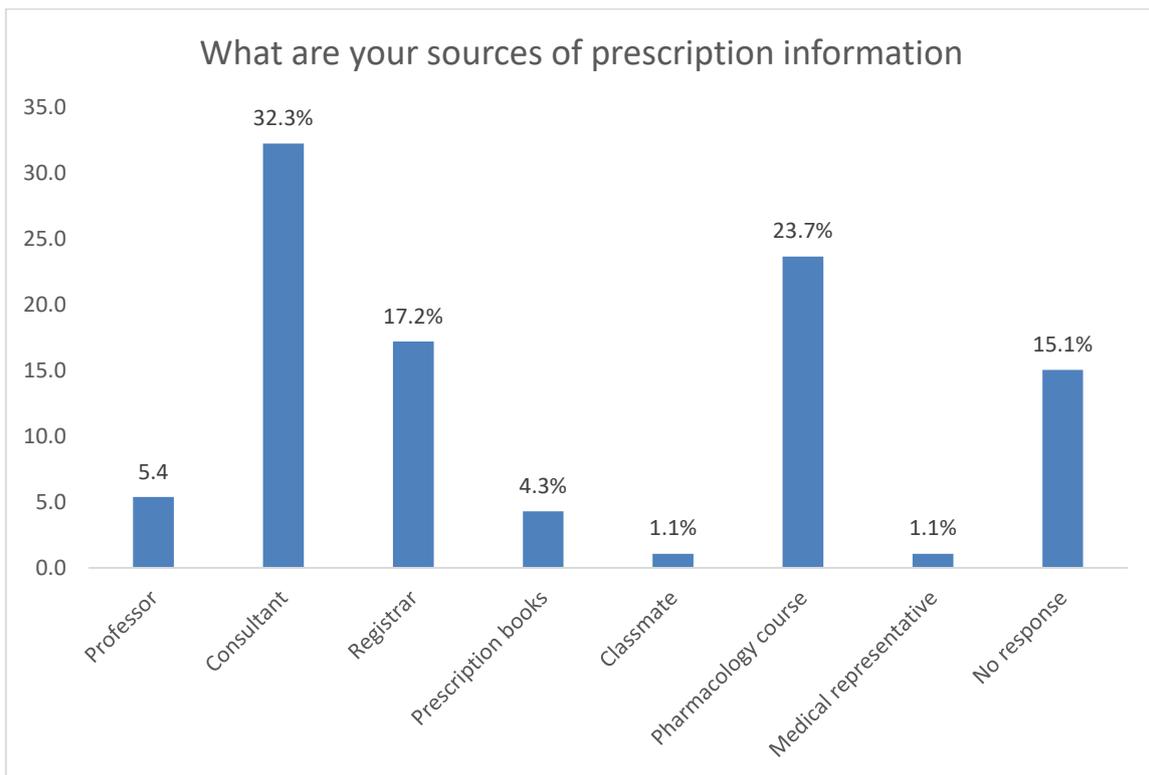


Figure 2: Most common health conditions treated in dental practice.

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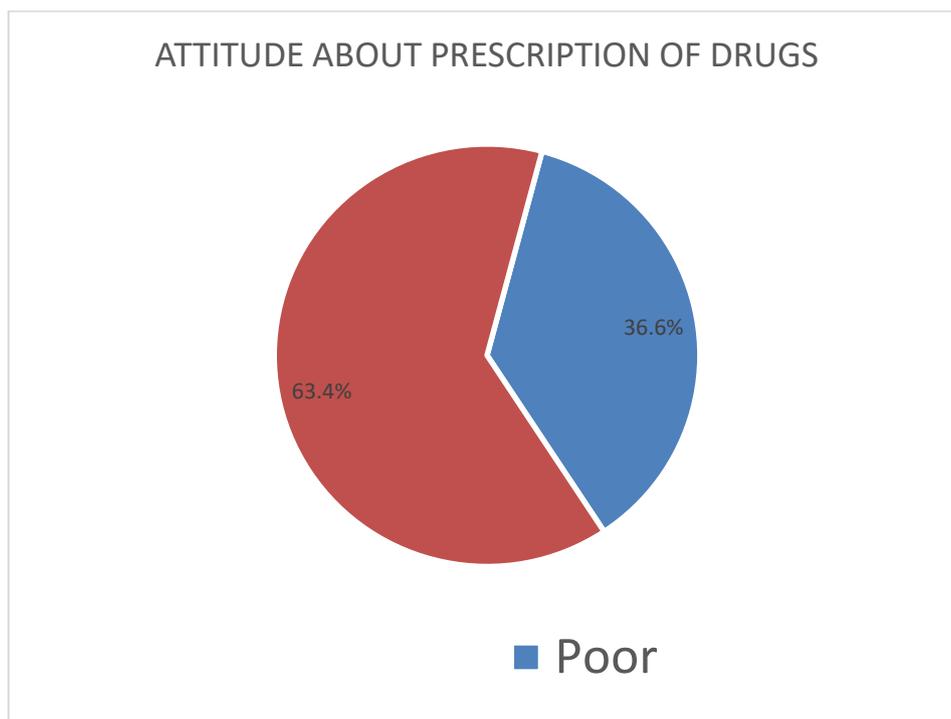


**Figure 3: Common errors in prescription**



**Figure 4: Sources of prescription information**

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**Figure 5: Attitude about prescription of drugs.**

**TABLES**

**Table 1: Socio-demographic characteristics of respondents (n=93)**

Variable	Frequency n (%)
<b>Age group (years)</b>	
18 – 20	11 (11.9)
21 – 25	48 (51.7)
26 –30	29 (31.4)
31–33	5 (5.4)
Mean ± S.D	24.34±3.5
<b>Gender</b>	
Male	50 (53.8)
Female	43 (46.2)
<b>Level</b>	
400L	35(37.6)
500L	22 (23.7)
600L	36 (38.7)
<b>Ethnic group</b>	
Bini	30 (32.3)
Yoruba	7 (7.5)
Igbo	26 (28.0)
Others	30 (32.2)
<b>Religion</b>	
Christian	93 (100.0)

S.D: Standard deviation

**Table 2: Self-assessed Knowledge of Prescription of Drugs amongst the Respondents**

QUESTIONS	YES N (%)	NO N (%)	NOT SURE N (%)
Have you attended lectures or training on drug prescription?	61(65.6)	31(33.3)	1(1.1)

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	92(98.9)	1(1.1)	0(0.0)
Do you think clinical dental students need to have knowledge about prescription of drugs?			
Do you know about the prescription paper?	77(82.8)	15 (16.1)	1(1.1)
Do you know about the prescription writing?	65(69.9)	27(29.0)	1(1.1)
Do you know how to write a prescription?	45(48.4)	36 (38.7)	12(12.9)
If Yes do you know the parts of a prescription?	41(44.1)	36(38.7)	16(17.2)
Can you effectively write a prescription?	35(37.6)	4(44.1)	17(18.3)
Are you aware of WHO guide for good prescription?	29(31.2)	53(57.0)	11(11.8)
Do you have knowledge about dose of drug prescribed?	59(63.4)	23(24.7)	11(11.8)
Do you have knowledge about the frequency of drug to be prescribed?	57(61.3)	28(30.1)	8(8.6)
Do you have knowledge of duration for which drug has to be prescribed?	56(60.2)	29(31.2)	8(8.6)
Do you have knowledge about route of drug administration?	83(89.2)	7(7.5)	3(3.2)

**Table 3: Most common drugs prescribed.**

Drugs	Frequency n (%)
<b>NSAIDS:</b>	
Ibuprofen	54 (58.1)
Paracetamol <sup>29</sup> (31.2)	
Diclofenac	8 (8.6)
Naproxen	2 (2.2)
<b>Total</b>	<b>93 (100.0)</b>
<b>ANTIBIOTICS:</b>	
Amoxicillin	67 (72.0)
Ampicillin	22 (23.7)
Clindamycin	1(1.1)
Penicillin V	3 (3.2)
<b>Total</b>	<b>93(100.0)</b>

**Table 4: self-reported attitude about prescription of drugs.**

Questions	YES (%)	NO (%)	NOT SURE (%)
Do you often prescribe drugs?	32(34.4)	57(61.3)	4(4.3)
Do you fill all necessary parent's details; such as name, age, sex and address?	51(54.8)	32(34.4)	10(10.8)
Do you enquire about past medical history before prescribing drugs?	56(60.2)	30(32.3)	7(7.5)

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Do you fill health history form for the patients?	38(40.9)	41(44.1)	14(15.1)
Do you obtain or have access to the vital medical signs before commencing treatment?	50(53.8)	24(25.8)	19(20.4)
Do you write your prescription details with clear and legible handwriting?	56(60.2)	23(24.7)	14(15.1)
Does your prescription detail require effort to read?	17(18.3)	59(63.4)	17(18.3)
Do you document the drugs you prescribed to patient after prescription?	41(44.1)	30(32.3)	22(23.7)
Do you prescribe drugs with generic name?	42(45.2)	26(28.0)	25(26.9)
Do you prescribe drugs with trade name?	21(22.6)	48(51.6)	24(25.8)

**Table 5: Association between knowledge of prescription of drugs and selected sociodemographic.**

	Knowledge about prescription			Total	Statistics
	Poor	Fair	Good		
<b>Age group(years)</b>					
18 – 20	6 (54.5)	4 (36.4)	1 (9.1)	11 (100.0)	df=6, P=0.000
21 – 25	12 (25.0)	22 (45.8)	14 (29.2)	48 (100.0)	
26 – 30	3 (10.3)	5 (17.2)	21 (72.4)	29 (100.0)	
31 – 33	0 (0.0)	0 (0.0)	5 (100.0)	5 (100.0)	
<b>Gender</b>					
Male	9 (18.0)	11 (22.0)	30 (60.0)	50 (100.0)	df=2, P=0.003
Female	12 (27.9)	20 (46.5)	11 (25.6)	43 (100.0)	
<b>Class(Level)</b>					
400	17 (48.6)	14 (40.0)	4 (11.4)	35 (100.0)	df=4, P<0.000
500	4 (18.2)	8 (36.4)	10 (45.4)	22 (100.0)	
600	0 (0.0)	9 (25.0)	27 (75.0)	36 (100.0)	

**Table 6: Association between knowledge and attitude toward prescription of drugs.**

	Knowledge			Total	Statistics
	Poor	Fair	Good		
<b>Attitude</b>					
Poor	18 (52.9)	15 (44.1)	1 (2.9)	34 (100.0)	df=2, P<0.000
Good	3 (5.1)	16 (27.1)	40 (67.8)	59 (100.0)	