

Dentists' knowledge level regarding drugs prescription

Nível de conhecimento dos cirurgiões-dentistas sobre a prescrição de medicamentos

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ABSTRACT

This study investigated the level of knowledge of Brazilian dentists regarding drugs prescriptions. This was a cross-sectional study with snowball sampling method, from sending the form built in Google Forms by WhatsApp and emails listed in the Regional Councils of Dentistry (CRO) of Brazil. They were asked about the academic training and sufficiency of the disciplines of Pharmacology and/or Therapeutics. Descriptive and analytical statistics were used adopting a significance level of 5%. 98.3% of the 120 participants studied Pharmacology and/or Therapeutics, but stated that their duration was not enough to make them feel safe to prescribe (58.3%). The average of correct answers was 8.7 ± 1.6 questions per dentist and the professionals trained in public universities (9.2 ± 1.7) and those who sought knowledge updates (9.2 ± 1.9) correctly answered significantly more questions. In general, most of the sample presented a moderate level of knowledge on drug prescription, demonstrating deficits in some areas.

Palavras-chave: Dentistry. Pharmacology. Therapeutic.

RESUMO

Este estudo investigou o nível de conhecimento dos dentistas brasileiros em relação à prescrição de medicamentos. Tratou-se de um estudo transversal com método de amostragem bola de neve, a partir do envio do formulário construído no Google Forms por WhatsApp e e-mails listados nos Conselhos Regionais de Odontologia (CRO) do Brasil. Eles foram questionados sobre a formação acadêmica e a suficiência das disciplinas de Farmacologia e/ou Terapêutica. Foram utilizadas estatísticas descritivas e analíticas, adotando-se um nível de significância de 5%. 98,3% dos 120 participantes cursaram Farmacologia e/ou Terapêutica, mas afirmaram que sua duração não foi suficiente para que se sentissem seguros para prescrever (58,3%). A média de acertos foi de $8,7 \pm 1,6$ questões por dentista e os profissionais formados em universidades públicas ($9,2 \pm 1,7$) e os que buscaram atualização de conhecimentos ($9,2 \pm 1,9$) responderam corretamente a um número significativamente maior de questões. Em geral, a maioria da amostra apresentou um nível moderado de conhecimento sobre prescrição de medicamentos, demonstrando déficits em algumas áreas.

Keywords: Odontologia. Farmacologia. Terapêutica.

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1. INTRODUCTION

According to the Law N° 5.081/66, which regulates the exercise of dentistry in Brazil, it is established the use of medicines with internal and external application, as well as urgency medication in case of serious accidents that might compromise the life and health of the patient¹. Thus, the dentist, following the ethical-legal norms, should choose a suitable therapy for the treatment, control of disorders and their complications in the oral and maxillofacial complex and, later, perform the act of drug prescription, which aims to implement, in writing, the chosen treatment for the patient, with appropriate guidance on its administration².

The knowledge for the decision-making process as well as the act of prescribing should be acquired during graduation, however, a study conducted with students of the ninth and tenth semester, that evaluated their confidence on drugs prescription based on the knowledge acquired during graduation, reported that about 45% of students had frequent and 36% sporadic doubts. In addition, no individual in the study claimed to feel totally safe to prescribe³.

In this context, do dentists trained in the last 10 years, a period that corresponds to technological advances, access to information and improvements in teaching, in fact have knowledge to prescribe drugs in the ethical-legal and scientific fields of Dentistry? Under this perspective, the aim of this work was to investigate the knowledge of dentists regarding the prescription of medicines, based on current legislation and on the sufficiency of the disciplines studied during graduation.

2. MATERIALS AND METHODS

This study is an analytical, observational and cross-sectional survey type with data collection from February 25 to September 17, 2021. The survey was conducted through questionnaires, which were built as Google forms and sent to dentists via email and WhatsApp.

The studied group was composed of dentists properly registered in the Regional Councils of Dentistry (CRO) of Brazil and who had graduated in the last 10 years. As inclusion criteria, all of them should be dentists with active enrollment in the CRO. In addition, they should have completed the course in the last 10 years and shown interest in participating in the research through the acceptance of the Informed Consent Form (ICF).

Dentists who graduated more than 10 years from the start date of the research or who were not registered with the CRO were excluded, as well as those participants who did not fully or correctly complete the questionnaire (In case of typos in the written answers).

The recruitment for the research was done by snowball sampling method, through WhatsApp and emails registered on the CROs. All regional councils in Brazil were contacted to send the survey to the professionals, as well as participants were invited to send the questionnaire to other dentists. After answering, if the participants showed interest, the answers of the questions were sent to them. In addition, a copy of the Informed Consent Form (ICF) and the answers marked by the dentists were also sent to their email.

To perform the study, the questionnaire validated by Kula⁴ (2015) was used and adapted for this research. In order to avoid ambiguity and improve clarity in the responses, a pilot study with 20 individuals was developed to validate the research tool, in order to verify the need to make adjustments.

Socio-demographic data were collected from participants (gender, age, region where they live, educational institution, graduation year and work situation – if they are working and in which sphere, whether public, private or both). Plus, the individuals completed a questionnaire divided into three blocks, with questions and alternatives. Block A raised questions about academic training, block B investigated knowledge about the legislation regarding dental practice and block C evaluated knowledge about prescription in common and special situations.

The dentists were evaluated as to knowledge in prescription based on blocks B and C (14 questions). In case of 0-4 correct answers, they were classified as having a low knowledge about drug prescription, between 5-10 they had a moderate knowledge and from 11-14 a high knowledge.

All data were processed by descriptive statistics based on the calculation of absolute and relative frequencies for categorical variables, whereas for quantitative variables were employed measures of central tendency and variability. The normality of the number of correct answers in blocks B and C (dependent variable) was verified and an asymmetric distribution was found. Thus, for the analytical statistics, the non-parametric tests by Mann-Whitney (dichotomous variables) and Kruskal Wallis (more than two categories) were used, adopting a significance level of 5%, where comparisons in which $p < 0.05$ were considered statistically significant. In addition, Pearson's correlation coefficient was performed in order to verify whether the quantitative variables were correlated, using the same level of

significance. The analyses were performed by the program IBM SPSS Statistics (20.0 version).

This study followed all the norms and guidelines that regulate human research, having been submitted to the electronic system Plataforma Brasil for consideration by the Research Ethics Committee and approved by the REC/HUAC - Alcides Carneiro University Hospital of the Federal University of Campina Grande under protocol number 4.418.148.

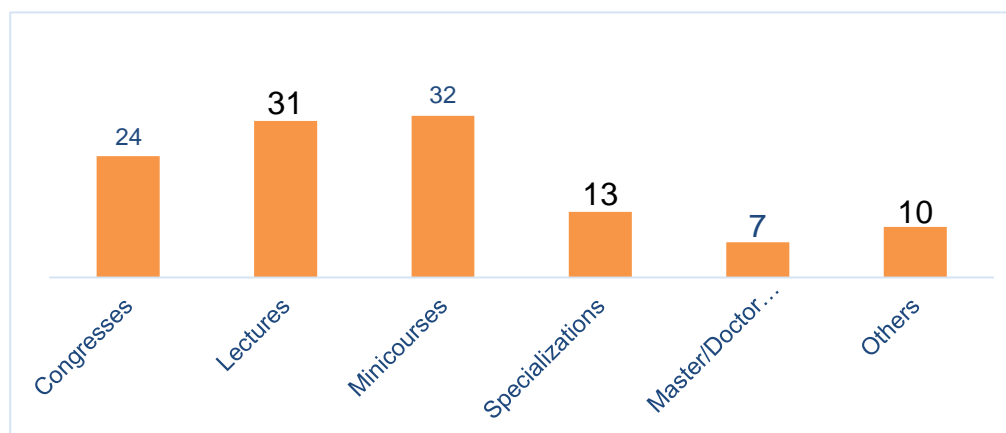
3. RESULTS

Altogether, 206 people participated in the research, however, after the application of the exclusion criteria, 86 participants were excluded (79 graduated more than 10 years ago, 4 did not complete the data correctly and 3 were not dentists). The final sample consisted of 120 individuals, being 60.8% female and 39.2% male, with ages between 21-52 years and mean of 28.71 ± 0.51 .

In addition, 76 (63.3%) participants of the survey live in the Northeast, 31 (25.8%) in the Central-west and 13 (10.9%) in the Southeast of Brazil. Also, 67 (55.8%) dentists graduated from private institutions and 53 (44.2%) from public institutions, mostly in the last five years (71.7%), with the majority currently working (87.5%), either in the private (42.5%), public (23.3%) or both sectors (21.7%). Besides, 60% of the sample reported prescribing drugs daily in their clinical routine.

Regarding the academic training of the dentists (Block A), only two (1.7%) participants did not have the discipline of Pharmacology and/or Therapeutics. Of those who did, most attended in the second year (50%) and although the year in which the discipline was offered was considered ideal by the majority of the sample (55.8%), dentists consider that the duration of the discipline was not the most appropriate for them to feel fit to prescribe (58.3%). It is also worth mentioning that a considerable part (60.8%) of the dentists classified having great interest in participating in courses and lectures on prescription, but only a portion (40.9%) did any knowledge update in this area after graduating. Graphic 1 shows how dentists updated themselves in Pharmacology and/or Therapeutics.

Figure 1. Ways of knowledge updating in Pharmacology and/or Therapeutics most frequently performed by dentists (n=120), Brazil, 2021.



When asked about the current legislation on drug prescription in Brazil (Block B), of the five questions, a high percentage of participants failed three. Table 1 shows that the main errors are related to the legal responsibility of the document (75% wrongly answered), interchangeability of prescription (96.7%) and types of drugs that can be prescribed by dentists (84.2%). Regarding this last one, many dentists pointed out that medications such as antidepressants, parasympathomimetic drugs, anticonvulsants and antivirals are prohibited from being prescribed.

Table 1. Percentage of correct and wrong answers related to questions about the prescription of medicines according to the current dental legislation (n=120), Brazil, 2021.

VARIABLES	ANSWERED CORRECTLY (%)	ANSWERED WRONGLY (%)
Knowing that the drug prescription is a legal document, who is responsible for this document?		
The dentist and the pharmacist, who prescribes and who dispenses the medicine, respectively	30 (25%)	90 (75%)
Which group of drugs is not on the list of medications that can be prescribed by dentists (except in emergency situations)?		
Oral hypoglycemic agents	19 (15.8%)	101 (84.2%)
Considering that there is no interchangeability restriction from the dentist, the pharmacist can replace:		
A reference drug by a generic or similar equivalent	4 (3.3%)	116 (96.7%)
It must be included in the prescription of an antimicrobial (antibiotic) made by the dentist for an adult patient:		

A simple prescription in three copies (one of them filed by the dentist by recommendation of the CFO), with full name, age and sex of the patient and information of the prescriber, such as address, phone number, CRO registration number, stamp and signature	111 (92.5%)	9 (7.5%)
How do you provide prescriptions?		
Always printed or in writing	115 (95.8%)	5 (4.2%)

Regarding common and special clinical situations requiring the correct prescription of medicines (Block C), most dentists correctly answered all nine questions (Table 2). In general, when the mean of correct answers in blocks B and C was verified, each professional was correct in 8.7 ± 1.6 of the 14 questions. Thus, 92 (76.7%) professionals had moderate knowledge, 24 (20%) a high-level knowledge and only 4 (3.3%) a low-level knowledge.

Table 2. Percentage of correct and wrong answers related to questions about common and special dental prescription situations (n=120), Brazil, 2021.

VARIABLES	ANSWERED CORRECTLY (%)	ANSWERED WRONGLY (%)
What is the recommended dose of amoxicillin to be used 1 hour before the procedure (considering a risk situation), aiming at antibiotic prophylaxis of bacterial endocarditis (infectious) in adults?		
2g	73 (60.8%)	47 (39.2%)
In case of patients allergic to penicillins, which are the antimicrobials and recommended doses to be used 1 hour before the procedure (considering a risk situation), aiming at antibiotic prophylaxis of bacterial endocarditis (infectious) in adults?		
Clindamycin 600mg or Azithromycin 500mg	119 (99.2%)	1 (0.8%)
What drug (s) can facilitate an Oral Candidosis (Candidiasis) case?		
Antimicrobials	74 (61.7%)	46 (38.3%)
What type of drug is metronidazole commonly associated with in order to treat aggressive periodontitis?		
Antimicrobials	85 (70.8%)	35 (29.2%)
Can the prescription of nonsteroidal anti-inflammatory drugs (NSAIDs) for hypertensive patients undergoing treatment lead		

to decreased antihypertensive action and increased risk of renal dysfunction?	83 (69.2%)	37 (30.8%)
Yes		
When prescribing an oral drug for a 7-year-old child, which pharmaceutical forms are most recommended?		
Solution drops, oral suspension and oral solution	112 (93.3%)	8 (6.7%)
Which vasoconstrictor is not recommended for use in pregnant patients?		
Felypressin – Octapressin®	93 (77.5%)	27 (22.5%)
Which sign(s) or symptom(s) is(are) not characteristic of an overdose (toxicity) by a local anesthetic with vasoconstrictor?		
Gastrointestinal bleeding and cramps	64 (53.3%)	56 (46.7%)
While treating an elderly, alcoholic patient with hepatopathy, which analgesic has contraindication in the control of mild pain, even with rare cases of hepatotoxicity in therapeutic doses?		
Paracetamol	65 (54.2%)	55 (45.8%)

The number of correct answers was not correlated to age ($p = 0.815$, $r = -0.022$) and to the year in which dentists graduated ($p = 0.652$, $r = -0.042$), however, when comparing the mean of correct answers of blocks B and C between the sociodemographic variables and the academic training characteristics of dentists (Block A), it was found that professionals trained in public institutions had a statistically higher average (9.25 ± 1.76) than those who graduated from private colleges (8.31 ± 2.08 ; $p = 0.012$). In addition, dentists who sought knowledge updates in Pharmacology and/or Therapeutics also scored statistically more (9.29 ± 1.93) than those who did not (8.34 ± 1.95 ; $p = 0.009$). The other variables did not present significant differences between the groups ($p > 0.05$).

4. DISCUSSION

Dentists, according to Brazilian law, are able to prescribe any type of medication applied to dental clinical practice. For that, during graduation, universities should allocate an adequate amount of hours to the ministry of the disciplines of Pharmacology and/or Therapeutics. However, one study reported that only 22% of the total workload of Dentistry courses in Brazil are destined to the basic cycle, which includes Pharmacology, for example⁵.

It is worth mentioning that in addition to Pharmacology, the basic cycle of the Dentistry course is composed of disciplines such as Anatomy, Histology, Physiology, among others. Moreover, when we refer to Therapeutics, which is the application of theoretical knowledge about Pharmacology, this discipline shares space with a broad quantitative of professional subjects. In this sense, the large number of disciplines of the basic/professional cycle makes the time assigned to Pharmacology and/or Therapeutics be greatly reduced, and may damage the execution of the discipline and the assimilation of knowledge. This fact can be verified in our study, which showed that 58.3% of dentists considered that the duration of these disciplines was not the most adequate for them to feel safe in prescribing drugs, similar to the results found by Dantas et al.⁶ (2020).

Furthermore, regarding to continued education, which would be the solution for optimizing the outdated learning during graduation, mainly due to the low duration of the subjects, our study reported that 60.8% of the sample showed great interest in courses and lectures on prescription of medicines in Dentistry, however, most did not make any update in this area after the end of the course (59.1%). So, it is salutary a greater effort of universities in offering courses and lectures in Pharmacology and/or Therapeutics, to foster a greater participation of dentists in knowledge updating in these areas, mainly due to the fact that our study reports a greater amount of correct answers by those who made some update after the end of the course ($p < 0.01$).

A greater investment in continued education is necessary since in our research, when we ask about the current legislation in Brazil regarding dental prescription (Block B), something that needs to be constantly revised since the laws keep changing, the majority of participants (75%) wrongly answered the question that investigated the knowledge about the legal responsibility of the drug prescription document, corroborating the results obtained by Terada et al.⁷ (2012), which showed that 90% of the dentists did not respond correctly when asked about who was the legal responsible for the prescription document, pointing out similar erroneous items to those marked by dentists in this study.

Still, regarding the ethical and legal aspects of drug prescription, 84.2% of the participants in the study missed the pharmacological group that cannot be prescribed by dentists (except in emergency), marking mainly that antidepressants, parasympathomimetics, anticonvulsants and antivirals could not be prescribed. These data corroborate those found by Dantas et al.⁶ (2020), which showed that 70% of dentists did not

respond correctly when asked if oral hypoglycemic agents are the only medications that cannot be prescribed.

Regarding the use of medicines with applications in other areas, many dentists still have doubts or fears about the use of some of these drugs since the need to use some pharmacological classes in dental offices is not common. For example, a study by Castilho et al.⁸ (1999), confirmed by Souza et al.⁹ (2011) and recently by Melo et al.¹⁰ (2021) showed that the systemic pharmacological groups most used by dentists are antimicrobials, anti-inflammatory drugs and painkillers.

However, as mentioned before, based on the Law N° 5.081/66 dentists are able to prescribe any drug group as long as they are related to the treatment of diseases and oral-maxillofacial complications or urgency and emergency situations, with required prior knowledge of dentists about their uses and applications¹.

So, it is understood that some pharmacological groups erroneously marked in our study may, in fact, be prescribed by dentists because they have dental applications. For example, antidepressants, anticonvulsants, as well as other muscle relaxants may be used for treating orofacial pain, just as some parasympathomimetic drugs (pilocarpine) are used for salivary stimulation, or even antivirals for herpes treatment and other viral pathologies that may affect the oral cavity. Thus, the only drug class that is not indicated for prescription (except in emergency situations) are oral hypoglycemic agents, considering the need for medical evaluation in relation to diabetes⁴.

Regarding medication interchangeability, 96.7% of the sample did not know how to correctly answer which medications are interchangeable. From this perspective, Souza et al.⁹ (2011) reported that of the 307 dentists who participated in their research, 84.7% knew the difference between reference, generic and similar drugs, however, in our study, it has been shown that dentists do not know that the pharmacist can replace the reference medication with other pharmaceutical products, such as generic or similar equivalents.

It is noteworthy that the interchangeability of medications is a legal action, defined by law, so it is important that dentists, based on the recommendation of the World Health Organization (WHO), select a set of drugs commonly used in their clinical practice and have full knowledge about them, from the active substance to equivalent drugs and values since that for patients the price of the medicine is the reason for interchangeability. Thus, to avoid the exchange of medicines at the moment of purchase and, eventually, the difference in the

therapeutic effect expected, it is necessary that the prescriber master the drug that is being prescribed¹¹.

It is also worth mentioning that in this research most of the volunteers correctly answered the questions about which mandatory data should be included in a prescription for antibiotics, and what is the correct form of prescription (always in writing), having obtained results similar to those found in other studies published in the scientific literature^{7,12}.

Regarding the prescription of drugs in common and special situations (Block C), a significant portion of the participants correctly answered all the evaluative questions. However, when asked about signs and symptoms of local anesthetics overdose and which analgesic is not indicated to an elderly, alcoholic patient with hepatopathy, a higher percentage of error was verified, since 46.7% and 45.8% of the sample were wrong, respectively. These findings differ from those found by Dantas et al.⁶ (2020), considering that in their work only 30% of dentists wrongly answered the first question and 20% the second.

In view of this, based on the average percentage of correct answers of the participants, it was verified that dentists know less about ethical and legal aspects of the dental prescription (Block B), than about common situations of clinical practice (Block C). Overall, the mean of correct answers was 8.7 ± 1.6 questions per dentist, with dentists trained in public institutions having significantly better performances than those trained in private institutions, differing from the study conducted by Hochscheidt et al.¹³ (2021).

Regarding the level of knowledge, 92 (76.7%) dentists had moderate knowledge, 24 (20%) a high level and only 4 (3.3%) low knowledge level. These results are similar to those of Castilho et al.⁸ (1999) and Costa et al.¹⁴ (2018) who showed a sufficient or regular level of knowledge, however, these studies consisted on the self-assessment of the participants, which differs from the present study.

Therefore, due to the high methodological variability of studies in this area, it is possible to state that this research brought adequate explanations about the level of knowledge of dentists in Brazil, in view of the establishment of scores that leveled this knowledge, in addition to questionnaires that covered not only academic training, but also legislation and clinical practice within the scope of drug prescription.

As a limitation of this research, there is low adherence by dentists, considering that some regions of the country did not have sample representation. Also, due to the remote data collection method, the sample loss was considerable, mainly because of errors on

questionnaire fillment. Thus, it is imperative to carry out new researches expanding the interaction with dentists from different areas of Brazil, using new methods of recruitment and dissemination in other social networks as well as the use of platforms that allow the application of explanatory videos about the questions to avoid sample loss.

5. CONCLUSION

It is possible to state that some Brazilian dentists participating in this study have a moderate level of knowledge about drug prescription. Still, regarding the current legislation on the prescription of drugs and to some common clinical situations in dental practice, many dentists have knowledge deficits, since the number of errors in certain questions was notorious.

Moreover, a large number of dentists do not consider that the duration of the disciplines of Pharmacology and/or Therapeutics was sufficient for them to feel safe during prescription, this alongside the fact that most participants prescribe drugs daily highlights the need for curricular changes in Dentistry graduations in Brazil by assigning more time to these disciplines and expanding the knowledge of future professionals. Furthermore, it is imperative the participation of both private and public Higher Education Institutions in the promotion and realization of continued education courses in Pharmacology and/or Therapeutics to reduce the lack of knowledge in drug prescription by dentists, since it was verified that those who performed knowledge updates correctly answered significantly more questions about prescription.

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