





Evaluation of last-year dental students' knowledge of prescription of analgesics and anti-bacterial agents for pregnant and lactating women

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Aim: Oral health in pregnant and lactating women can affect maternal and child health. Dental treatments in this period should not have adverse effects on maternal and child health. This study was conducted to investigate the last-year dental students' knowledge of the prescription of analgesics and antibiotics for pregnant and lactating mothers in Isfahan city, Iran. **Methods:** A total of 104 last-year dental students of Khorasgan Islamic Azad University and Isfahan University of Medical Sciences were recruited in this descriptive-analytical study. They completed a 16-item questionnaire on the prescription of analgesics and antibiotics for pregnant and lactating mothers. Data were analyzed by SPSS (Version 22) statistical software (t-test). **Results:** The total mean score of students' knowledge was 9.02 ± 1.91 . The highest level of knowledge about the safest analgesic (acetaminophen) was reported for the pregnant patients so that 100% of them had correct information in this regard. Further, the lowest level of knowledge was found for the use of dexamethasone during lactation, as only 10.6% of respondents were able to provide a correct response in this regard. **Conclusion:** The dental students had average knowledge about the prescription of antibiotics and analgesics for pregnant and lactating patients. To prevent the possible risks for these patients, further information should be provided to dental students.

Keywords: Pregnancy. Lactation. Analgesics. Anti-bacterial agents.



Introduction

Precautions are necessary when dealing with pain or infection in all patients, but special consideration should be given to pregnant and lactating mothers. Fetal and neonatal health is a major concern in medication prescription. Knowledge of the toxicity and teratogenic effects of prescription drugs is crucial because high drug concentrations can cross the placenta and have detrimental effects on fetal growth¹.

Analgesics have the same effects as anesthetics in pain control, except that they do not cause loss of consciousness. Pressure and temperature are sensed, but the pain is not sensed. This pharmaceutical group is essential for the treatment of postoperative pain, and a large number of drugs in this category are safe for modulating pain in pregnant and lactating patients. Acetaminophen is the drug of choice for reducing postoperative pain. By proving its benign nature during pregnancy, acetaminophen is located in category B. However, its use in the third trimester in women with preeclampsia may cause premature birth. Ibuprofen is also located in category B, but it is located in category C in the third trimester. All non-steroidal anti-inflammatory drugs (NSAIDs) are contraindicated in the third trimester due to premature closure of the ductus^{2,3}.

When a patient has symptoms of systemic involvement, antibiotics are used to prevent the spread of bacteria and to help wound healing by assisting the immune system. Care should be taken when prescribing antibiotics because they have adverse effects on the fetus after passing through the placenta. Some antibiotics are more harmful than others and cause malformations and abnormalities. Penicillin and cephalosporin are located in category B and are relatively safe during pregnancy and lactation⁴.

Since few studies have examined the dental students' knowledge of prescribing analgesics and antibiotics for pregnant and lactating mothers, this study was designed to investigate the last-year dental students' knowledge of prescribing analgesics and antibiotics for pregnant women and lactating mothers in Isfahan city, Iran. We chose this population because we want to know the quality of educations at school of dentistry and the students learning level before graduating. Also, pregnant and lactating women because usually do not receive adequate treatments from general dentists.

Materials and methods

The study population of this descriptive-analytical cross-sectional study comprised the last-year dental students of Khorasgan Islamic Azad University and Isfahan University of Medical Sciences. The approval protocol number issued by Isfahan Institutional Ethics Committee is 399595. They were assured that the researchers have kept all the information confidential and they are only allowed to publish the general and group results of this research without mentioning names and details

The inclusion criteria comprised all final-year dental students of Khorasgan Islamic Azad University and Isfahan University of Medical Sciences, and the exclusion criterion was incomplete questionnaires. The sampling method was easy sampling. In this sampling method, the selected units have an equal chance to be selected. Then, according to the deviation from the mean and the following formula, the sample volume was calculated.

$$(NZ^2\sigma^2)/d^2(N - 1) + Z^2\sigma^2$$

With the number of 104 samples, the average knowledge score was obtained with a confidence of 95% and a maximum error of 0.35.

Data were collected through a questionnaire developed under the supervision of supervisors. The content validity ratio was used to validate the content of the items, and the internal consistency with Cronbach's alpha ≥ 0.7 was used to measure the reliability of the questionnaire. The questionnaires were analyzed anonymously. We constructed this questionnaire by researchers and the validity and reliability of it approved by oral and maxillofacial specialists and dental public health PhDs. Every question had one point, so 16 questions had 16 points. If the participant answered correctly he/she got one point, while wrong answer get zero point. Data were analyzed by SPSS (Version 22) statistical software (t-test)

Results

The study sample consisted of 104 final-year dental students in Isfahan city, Iran. Of them, 48 (46.2%) were men and 56 (53.8%) were women. Further, 82 (78.8%) of the participants were students of Isfahan University of Medical Sciences and 22 (21.2%) were students of Khorasgan Islamic Azad University. The frequency distribution and percentage of patients' correct responses to the questions are shown in Table 1.

Table 1. Frequency distribution of correct responses of final-year dental students in Isfahan regarding the prescription of analgesics and antibiotics for pregnant and lactating mothers

Questions	Frequency	Percentage
Is dexamethasone contraindicated during lactation?	11	6.10
Can codeine-acetaminophen be prescribed for pregnant women in an emergency?	35	7.33
Is cephalexin contraindicated in pregnant women?	35	7.33
Is it safe to give codeine-acetaminophen to a baby during lactation?	41	4.39
Is metronidazole contraindicated during pregnancy?	55	9.52
Is mefenamic acid the drug of choice in case of severe toothache in pregnant patients?	55	9.52
Can aspirin be used during lactation?	56	8.53
Does prescription of cephalosporin during lactation change the color of the baby's teeth?	58	8.55
Is gelofen allowed in the first trimester of pregnancy?	59	7.56
Does metronidazole change the taste of milk during lactation?	61	58.7
Does ibuprofen cause postpartum hemorrhage in the third trimester of pregnancy?	63	6.60
Is dexamethasone safe for the fetus during pregnancy?	68	4.65
Can clindamycin be used if a pregnant patient is allergic to penicillin?	69	3.66
Is it safe to take amoxicillin during lactation?	70	3.67
Is tetracycline harmful to the baby during lactation?	99	2.95
Is codeine-free acetaminophen the safest analgesic in pregnant patients?	104	100

After collecting the questionnaires, the data was analyzed using SPSS version 22 software. It was used to compare the evaluation between different groups. T-Test and ANOVA of alpha coefficient test (significance level of average alpha) for all calculations and 95% confidence interval including size (2 standard errors) are considered.

The mean total score of students' knowledge was 9.02 ± 1.91 (56.37%) out of 16. The results of the t-test showed no significant difference between the male and female students in the mean score of knowledge about prescribing analgesics and antibiotics for pregnant and lactating mothers. (Table 2).

Table 2. Mean \pm SD scores of knowledges by gender

	Gender	Number	Mean	SD	P-value
Total score of knowledge (from 16)	Male	48	20.9	88.1	37.0
	Female	56	87.8	95.1	
Score of knowledge about analgesic-pregnancy (from 6)	Male	48	708.3	270.1	89/0
	Female	56	678.3	046.1	
Score of knowledge about analgesic-lactation (from 3)	Male	48	041.1	873.0	97.0
	Female	56	035.1	682.0	
Score of knowledge about antibiotic-pregnancy (from 3)	Male	48	500.1	875.0	74.0
	Female	56	553.1	807.0	
Score of knowledge about antibiotic-lactation (from 4)	Male	48	958.2	874.0	05.0
	Female	56	607.2	947.0	

The results of the t-test indicated no significant difference between the two universities in the mean score of knowledge about prescribing analgesics and antibiotics for pregnant and lactating mothers (Table 3).

Table 3. Mean \pm SD scores of knowledges by university

	University	Number	Mean	SD	P-value
Total score of knowledge (from 16)	Isfahan University of Medical Sciences	82	01.9	95.1	86.0
	Khorasgan Islamic Azad University	22	09.9	77.1	
Score of knowledge about analgesic-pregnancy (from 6)	Isfahan University of Medical Sciences	82	707.3	12.1	79.0
	Khorasgan Islamic Azad University	22	636.3	25.1	
Score of knowledge about analgesic-lactation (from 3)	Isfahan University of Medical Sciences	82	012.1	761.0	51.0
	Khorasgan Islamic Azad University	22	136.1	888.0	
Score of knowledge about antibiotic-pregnancy (from 3)	Isfahan University of Medical Sciences	82	548.1	848.0	64.0
	Khorasgan Islamic Azad University	22	454.1	800.0	
Score of knowledge about antibiotic-lactation (from 4)	Isfahan University of Medical Sciences	82	743.2	978.0	59.0
	Khorasgan Islamic Azad University	22	863.2	710.0	

Discussion

According to the results of this study, the lowest level of knowledge was found for the use of dexamethasone during lactation, as only 10.6% of respondents were able to provide the correct response in this regard. Prohibition of tetracycline for lactating mothers was also one of the questions about which there was appropriate knowledge (95.2%).

The study of Mozaffari et al. on 106 general dentists and specialists in Mashhad showed the percentage of incorrect answers to the item “the antibiotic of choice in case of allergy to penicillin” was very high. Moreover, the study of Ahmadimotamayel et al. on 58 dental students and 96 dentists in Hamedan indicated only 37% of dentists answered the same question correctly, while this rate was almost double in students. In the present study, the response rate for the same question was 66.3%. The higher level of knowledge of students than dentists can be due to the frequent review of this subject in different courses^{5,6}. In the study of Ahmadimotamayel et al. on the knowledge of students and general dentists in Hamedan about the drugs used in dental treatments, the response rate to the questions was 64%, which is in line with the results of the present study⁶.

The study of Mansour et al. on 322 Lebanese dentists regarding their knowledge, practice, and attitude toward the use of antibiotics showed 47% of participants selected amoxicillin and 20% of them chose spiramycin as the first antibiotic of choice during pregnancy and lactation. However, in the present study, the knowledge of amoxicillin prescription during lactation was 67.3%. This difference in results may be due to differences in the pharmaceutical market and training⁷. It means this difference in results may be due to differences in the pharmaceutical market and education. pharmaceutical market means the medication that are common in the drugstores.

Coric et al.⁸ conducted a study on 115 dentists in Croatia, Bosnia, and Herzegovina to assess their attitudes toward antimicrobial treatments. The mean age of participants was 40 years, and more than half of them had more than 10 years of experience. Thirteen percent were unsure about prescribing antibiotics, and 26% believed pregnant and lactating women should not take antibiotics. Contrary to expectations, 3.4% of respondents who thought they had sufficient knowledge to prescribe antibiotics needed retraining. According to the findings of this study, this group of dentists had poor knowledge, which is not in line with the results of the present study. This difference in results may be due to the dentists' detachment from the educational environment and the lack of retraining courses.

The study of Linga et al. on the knowledge of 188 final-year dental students in Saudi Arabia about the treatment of pregnant women showed the response rate for the safest analgesic (acetaminophen) was 55%, while this rate was 100% in the current study. This difference can be due to the lack of emphasis on this issue⁹.

Dentists should be familiar with the risks and benefits for pregnant or breast-feeding patients posed by five types of medication s: analgesics and anti-inflammatories, antibiotics, local anesthetics, sedatives and emergency medications¹⁰.

It is suggested that in dental schools, more attention should be paid to teaching the necessary measures for patients with special conditions, including pregnant and lactating women, so that by using the necessary methods for prevention and treatment, dentists can provide more help to such patients in advance. Prevent possible side effects. In the case of graduate dentists, new and appropriate and practical information about the necessary measures during pregnancy and breast-feeding should be available to them by organizing retraining classes and various congresses and authoring numerous books and pamphlets. Having the necessary information and proper performance, dentists have avoided unnecessary referral of patients to the doctor in many cases in order to avoid wasting people's time and money.

Limitations of the study was the non-cooperation of the studied population in filling the questionnaire correctly and completely, which can be solved by justifying the students and stating the necessity of the study.

Conclusion

The dental students had average knowledge about the prescription of antibiotics and analgesics for pregnant and lactating mothers. To prevent the possible risks for these patients, further information should be provided to dental students.

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Data availability

Datasets related to this article will be available upon request to the corresponding author.

Conflict of interests

None.

Authors' contributions

Fatemeh Abasi: design of the work, the acquisition, accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Sabra Frootan: Drafting the work and revising it critically for important intellectual content

Mehrdad Ebadi: Analysis and interpretation of data for the work

Zahra Seyyed Moallemi: Final approval of the version to be published

References

1. Zaki NM, Albarraq AA. Use, attitudes and knowledge of medications among pregnant women: a Saudi study. *Saudi Pharm J*. 2014 Nov;22(5):419-28. doi: 10.1016/j.jsps.2013.09.001.
2. Kennedy D. Analgesics and pain relief in pregnancy and breastfeeding. *Aust Prescriber*. 2011 Feb;34(1):8-10.
3. Donaldson M, Goodchild JH. Pregnancy, breast-feeding and drugs used in dentistry. *J Am Dent Assoc*. 2012 Aug;143(8):858-71. doi: 10.14219/jada.archive.2012.0290. Erratum in: *J Am Dent Assoc*. 2012 Nov;143(11):1187.
4. Lamont HF, Blogg HJ, Lamont RF. Safety of antimicrobial treatment during pregnancy: a current review of resistance, immunomodulation and teratogenicity. *Expert Opin Drug Saf*. 2014 Dec;13(12):1569-81. doi: 10.1517/14740338.2014.939580.
5. MossananMozafari P, Pakfetrat A, Amirchaghmaghi M, FarkhondehAghideh N. [Evaluation of awareness of general dentists and dental specialists about dental management of pregnant and diabetic patients]. *J Mashhad Dent Sch*. 2012;36(4):317-26. Persian.
6. AhmadiMotamayel F, Masumi S, Abdolsamadi H, Roshanaei G. [Awareness of general dentists and senior dental students of Hamadan city (Iran) about prescribed drugs in dental procedures]. *J Mashhad Dent Sch*. 2011;35(4):243-52. Persian.
7. Mansour H, Feghali M, Saleh N, Zeitouny M. Knowledge, practice and attitudes regarding antibiotics use among Lebanese dentists. *Pharm Pract (Granada)*. 2018 Jul-Sep;16(3):1272. doi: 10.18549/PharmPract.2018.03.1272.
8. Coric A, Grgic S, Kostic S, Vukojevic K, Zovko R, Radica N, et al. Attitudes of dental practitioners towards antimicrobial therapy in Croatia and Bosnia and Herzegovina. *Eur J Dent Educ*. 2020 Feb;24(1):88-94. doi: 10.1111/eje.12471.
9. Swapna LA, Alanazi EZM, Aldoji AAA, Koppolu P, Alqerban A. Awareness of dental interns to treat pregnant patients. *Open Access Maced J Med Sci*. 2019 Aug 29;7(19):3265-9. doi: 10.3889/oamjms.2019.678.
10. Donaldson M, Goodchild JH. Pregnancy, breast-feeding and drugs used in dentistry. *J Am Dent Assoc*. 2012 Aug;143(8):858-71. doi: 10.14219/jada.archive.2012.0290. Erratum in: *J Am Dent Assoc*. 2012 Nov;143(11):1187.