

2023

Evaluation of Knowledge, Attitude and Practice of Dental Interns about Using Antibiotics in Pediatric Dentistry

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Recommended Citation

Aied AS, El-Dokky NA, Nasr RA. Evaluation of Knowledge, Attitude and Practice of Dental Interns about Using Antibiotics in Pediatric Dentistry. *Future Dental Journal*. 2024; 9(2).

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Evaluation of Knowledge, Attitude, and Practice of Dental Interns about Using Antibiotics in Pediatric Dentistry

ABSTRACT

Introduction: Antimicrobial resistance is one of the ten threats identified by the World Health Organization (WHO) in 2019, since it affects modern healthcare and the effective prevention and treatment of an ever-increasing range of infections. Recent estimates of the burden of antimicrobial resistance are very significant, with more than half a million cases of infection with selected antibiotic-resistant bacteria or new emerging resistant pathogens occurring in Europe; of note, data regarding antimicrobial resistance in low-income countries are largely unknown, increasing the overall risk of mortality, in particular in surgical procedures

Aim: The aim of the study was to evaluate the knowledge, attitude, and practice of dental interns at Future University toward antibiotic drug use.

Subjects and Methods: The study included 71 dental students (interns) from the Faculty of Oral and Dental Medicine, Future University. Previous validated questionnaire was distributed amongst the participants so as to assess their knowledge, attitude, and practice regarding antibiotic use and its resistance. Data was analysed using chi square test and SPSS 20®.

Results: Out of a total 71 dental interns, 47.9 % were males and 52.1% were females. On average, interns scored higher in practice score followed by attitude and knowledge scores. The average practice score was 80.3% compared to 54.9% for attitude and 49.3% for knowledge. The results suggest that overall, female interns scored better than male interns on KAP of antibiotic use.

Conclusion: It was concluded that participants were well aware of the issue of bacterial resistance. Their practices demonstrated varying degrees of deviation from the AAPD's antibiotic prescription recommendations, especially in the form of over-prescriptions in instances when antibiotics were unnecessary.

KEYWORDS: Antibiotics, Resistance, Knowledge , Attitude , Practice.

Introduction:

Antimicrobial resistance is one of the ten threats identified by the World Health Organization (WHO) in 2019, since it affects modern healthcare and the effective prevention and treatment of an ever-increasing range of infections. Recent estimates of the burden of antimicrobial resistance are very significant, with more than half a million cases of infection with selected antibiotic-resistant bacteria or new emerging resistant pathogens occurring in Europe; of note, data regarding antimicrobial resistance in low income countries are largely unknown, increasing the overall risk of mortality, in particular in surgical procedures⁽¹⁾.

The illogical and overconsumption of antibiotics affect not only in the emergence of bacterial strains that are resistant but also in colorful adverse responses and pose fiscal burden on global health system. This illogical use arises from the colorful provident factors, healthcare programs concerning medical insurance, a lack of physicians, enterprises pertaining long term resistance and effect versus treating current symptoms, marketing of medicinal and antibiotics trade without tradition in some countries⁽²⁾.

In the Middle East countries, receiving antibiotics is easy and considered as over the counter drug and there are no restrictions on using such medications and could be bought without a prescription⁽³⁾. In recognition of the growing problem of antibiotic resistance, professional associations of health care interpreters have developed guidelines regarding the applicable use of antibiotics. It has been set up that dentists define between 7 and 11% of all common antibiotics. The American Academy of Pediatric Dentistry (AAPD) has published guidelines for antibiotic use, feting the adding frequence of antibiotic resistant microorganisms⁽⁴⁾.

WHO,⁽⁵⁾ defined the knowledge, attitude and practice (KAP) surveys as a 'representative study of specific population to collect information on what is known, believed and done in relation to specific topic'. It focus specifically on knowledge, attitudes and practices for a certain topic. It can detect a lack of knowledge thereby improving understanding and action targeting improvement in oral health, in most KAP surveys data are collected orally by an interviewer using a structured, standardized questionnaire.

The knowledge possessed by dental interns refers to their understanding of antibiotic use. Attitude refers to their perception regarding the importance of this topic. Practice refers to the ways they demonstrate their knowledge and attitude through their actions. For that reason, this study was conducted to evaluate the knowledge, attitude and practice of dental interns in Future University toward antibiotic drug use.

Subjects and Methods

This study was conducted in the Faculty of Oral and Dental Medicine, Future University for evaluation of knowledge, attitude and practice of dental interns about using antibiotics in pediatric dentistry during the period from March 2021 to August 2021.

Eligibility criteria:

Inclusion criteria:

- Dental interns students in Future university who completed Pediatric Dentistry round.

Exclusion criteria:

- Undergraduate students.
- Postgraduate dentists.

Sample size calculation:

Based on a previous study ⁽⁶⁾; The mean \pm SD of knowledge, attitude, and practice score of dental interns on using antibiotics in pediatric dentistry were 2.94 ± 1.95 , 2.14 ± 1.96 , and 1.89 ± 2.14 respectively. Assuming that the maximum accepted error margin for the mean score is = 0.5 units, we need to study at least 59, 59, and 71 dental interns respectively to be able to achieve 80% power setting the alpha error to 0.05. Therefore, we decided to include 71 dental interns.

Questionnaire:

1. It was based on previous validated questionnaire done in India⁽⁷⁾.
2. The Questionnaire is composed of four category questions.
3. Classified into questions regards knowledge, attitude, and practice.

PO: Population (P) of the study:

All dental interns that completed their training period in Pediatric Dentistry and Dental Public Health Department, Faculty of Oral and Dental Medicine, Future University during 6 months period (March 2021 till August 2021). The target population of this study consisted of 71 dental interns (pediatric dentistry round) in Faculty of Oral and Dental Medicine, Future University. Seventy-one questionnaires are subjected to statistical analysis.

- The questionnaire included 22 questions divided into four sections.

The first section (demographic data):

Consists of 4 questions about their names, gender, year of graduation and email (optional).

The second section (knowledge about antibiotics): (Q1-Q10).

Consists of 10 closed ended questions (true/false/not sure) & (4 days-5 days-6 days-7 days) & (yes/no/not sure).

The third section (attitude for antibiotics): (Q11-Q19).

Consists of 9 questions, they are close ended questions, while Q13 is multiple choice question, and Q14 has 3 sub questions.

The fourth section (practice with antibiotics): (Q20-Q22).

Consists of 3 questions, they are close ended questions, while Q20 has 12 sub questions, Q21 is multiple choice question, and Q22 has 1 sub question.

- Each dental intern was allowed to answer the questioner once.
- The aim of the study was clarified by the investigator

- All questionnaires were collected on the same day to prevent any of the participants from searching for the answers of questions that related to their knowledge.
 - During answering the questionnaire, participants were not allowed to ask their colleagues, to ensure accuracy of the answers of knowledge questions.
 - The investigator was not allowed to help the participant in answering the questions.
 - Participants were allowed to ask the researcher any question, either to clarify any part of the questions or anything about the survey.
 - The investigator dealt with the participant personally, so there was no risk of the same dentist to complete more than one questionnaire.
 - Questionnaires were collected after the participants had finished answering; incomplete questionnaires were excluded from the study.
- The total knowledge scores for each respondent were calculated, with 1 point awarded for a correct answer and none for an incorrect one. The total knowledge scores were categorized into 3 levels based on Bloom's cutoff: high level, moderate level, and low level. The mean total knowledge score was also determined⁽⁸⁾.
 - The same technique was used to calculate scores for attitude and practice .

Results

I. Demographic data:

1. Gender:

Comparison between males & females among sample was performed by using Chi square test which revealed that females (52.1%) were insignificantly higher than males (47.9%) as presented in table (1).

2. Questionnaire

1- Knowledge:

• Q1 & Q4:

Comparison between different answers in knowledge regarding Q1& Q4 were performed by using Chi square test which revealed significant difference, followed by multiple

comparisons which revealed significant difference between counts as presented in table (3) .

2- Attitude:

- ***Q 11:***

Comparison between different answers to question 11 was performed by using Chi square test which revealed significant difference between them, followed by multiple comparisons which revealed significant difference between counts as presented in table (6).

- ***Q 13:***

Comparison between different answers to question 13 performed by using Chi square test which revealed significant difference between them, followed by multiple comparisons which revealed significant difference between counts, as presented in table (8).

3- Practice:

- ***Q21, Q22 & Q23:***

Comparison between different answers to questions 21 , 22 & 23 was performed by using Chi square test which revealed significant difference between them in all questions, followed by multiple comparisons which revealed significant difference between counts while revealed insignificant difference in counts, as presented in table (10).

Score levels distribution among gender:

Comparison between male & female regarding different levels of score among knowledge, practice, attitude and total was performed by using Chi square test which revealed significant difference in all except poor level of knowledge, practice and total, moderate level of attitude & total and good level of total as $P > 0.05$ (males were significantly higher than females in moderate of knowledge, poor of attitude good of practice/ while was significantly lower than female in good of knowledge, attitude and moderate of practice), as presented in table (12).

Table (1): Frequency and percentages of gender.

Gender	N	%	P value
Male	34	47.9	0.55
Female	37	52.1	
Total	71	100.0	

N: count %: percentage P: probability level which is significant at $P \leq 0.05$

Table (3): Frequency and percentages of true, false & not sure answers regarding knowledge questions (Q1&Q4).

Question	False		True		Not sure		P value
	N	%	N	%	N	%	
Q1 Antibiotics can cure infections caused by virus.	65 ^a	91.5%	4 ^b	5.6%	2 ^b	2.8%	<0.0001*
Q4 Excessive use of antibiotics leads to emergence of antibiotic resistance?	3 ^a	4.2%	66 ^b	93.0%	2 ^a	2.8%	<0.0001*

N: count %: percentage P: probability level which is significant at $P \leq 0.05$

Table (6): Frequency and percentages of no, yes & not sure answers regarding attitude question (Q11).

Question	No		Yes		Not sure		P value
	N	%	N	%	N	%	
Q11 Do you inquire from your patient about whether he/she has taken a course of antibiotics in the past 1 week before prescribing antibiotics?	14 ^a	19.7%	56 ^b	78.9%	1 ^c	1.4%	<0.0001*

N: count %: percentage P: probability level which is significant at $P \leq 0.05$

Table (8): Frequency and percentages of different answers regarding attitude questions (Q13).

Q13	Answers			P value
		N	%	
A patient presents with an orofacial infection and you have prescribed a course of antibiotics and given an appointment after the course is completed. The patient returns to you and there is not much improvement. What would you prefer to do in the following situation?	Drainage + antibiotic	49 ^a	69.0%	<0.0001*
	Drainage without antibiotic	16 ^b	22.5%	
	Antibiotic + later appointment	6 ^c	8.5%	

N: count %: percentage P: probability level which is significant at $P \leq 0.05$

Table (10): Frequency and percentages of different answers regarding practice questions (Q21,22,23).

Questions	Answers	N	%	P value
Q 21 Which is the most commonly prescribed antibiotic by you?	Amoxicillin	18 ^a	25.4%	0.01*
	Amoxicillin + Clavulanic Acid	18 ^a	25.4%	
	Clindamycin	17 ^a	23.9%	
	Metronidazole	7 ^b	9.9%	
	Penicillin V	11 ^a	15.5%	
Q 22 Does your prescription vary when there is an evidence of anaerobic infection?	No	3 ^a	4.2%	< 0.0001*
	Yes	61 ^b	85.9%	
	Not sure	7 ^a	9.9%	
Q 23 If yes, what would be your prescription?	Not prescribe	10 ^a	14.1%	< 0.0001*
	Amrizole	4 ^a	5.6%	
	Augmentin	13 ^a	18.3%	
	Flagyl	44 ^b	62.0%	

N: count %: percentage

P: probability level which is significant at $P \leq 0.05$

Table (12): Frequency and percentages of different scores among gender.

Score		Male (n=34)		Female (n=37)		P value
		N	%	N	%	
Knowledge	Poor	4	11.8%	1	2.7%	0.13
	Moderate	19	55.9%	12	32.4%	0.04*
	Good	11	32.4%	24	64.9%	0.04*
Attitude	Poor	10	29.4%	3	8.1%	0.02*
	Moderate	19	55.9%	20	54.1%	0.87
	Good	5	14.7%	14	37.8%	0.02*
Practice	Poor	1	2.9%	2	5.4%	0.61
	Moderate	24	70.6%	33	89.2%	0.04*
	Good	9	26.5%	2	5.4%	0.01*
Total	Poor	3	8.8%	1	2.7%	0.26
	Moderate	28	82.4%	28	75.7%	0.48
	Good	3	8.8%	8	21.6%	0.13

N: count %: percentage

P: probability level which is significant at $P \leq 0.05$

Counts with the same superscript letters were insignificantly different as $P > 0.05$

Counts with different superscript letters were significantly different as $P < 0.05$

Discussion

Considering the possible impact of antibiotic overuse in dentistry, to the problem of antimicrobial resistance and the scarcity of literature on antibiotic over-prescription in the pediatric population, the motivation for conducting this survey, which is done to describe knowledge, attitude, and practice related to antibiotic prescriptions for children among a group of dental interns who attended Faculty of oral and Dental Medicine, Future University in Egypt. This goal, however, is comparable to that of previous surveys undertaken in India, the United States, Canada, and France.

This study was based on previous validated questionnaire done in India, (Konde et al., 2016)⁽⁷⁾. The questionnaire included 22 questions and was designed to measure knowledge, attitude and practice towards antibiotics. This questionnaire was used in the present study because its easier way of data collection, saving a lot of time, with direct questions which proven to be reliable and valid in agreement with the study of (AboAlSamh et al., 2018)⁽⁹⁾.

Prudent antibiotic use requires adequate knowledge paralleled by proper practice and a favorable attitude towards their prescription. The results of this study show that most of the participants demonstrated good knowledge with (49.3%), which agree with (Mahajan et al.,

2014)⁽¹⁰⁾ who had (77.5%) knowledge value. This difference may be due to different sample size in India.

The present study reported a (100%) response rate indicating interns cooperation where 71 questioners were statistically analyzed. This response rate was higher than rate reported in a similar study by (Mansour et al., 2018)⁽¹¹⁾ who used phone surveying, where response rate was (21%). This might be attributed to using face-to-face method in the current study, in comparison to the phone survey that usually yields low response rate.

As regards the frequency and percentage of gender in the present study, the highest percentage of participants were (n=37) (52.1%) females which was insignificantly higher than males (n=34) (47.9%) as presented in Table (1) . That could be due to the restrict commitment of female interns to the pediatric clinic and their knowledge was good with percentage (64.9%), while in males, their knowledge was moderate with percentage (55.9%). These results agree with (Tevatia et al., 2016)⁽²⁾ who found higher scores in knowledge in females.

However, the current study showed higher total KAP with moderate score in male interns with (82.4%) than female Interns with (75.7%) as presented in Table (12). This disagree with (Tevatia et al., 2016)⁽²⁾ who found higher total KAP scores in females. Because females may tend to stick to regulations and rules more than males.

Regarding the knowledge towards antibiotic role in curing the viral infections was (91.5%) as presented in Table (3), which is higher than reported in another study performed by (Lomi et al., 2019)⁽⁶⁾ as they stated that the interns were aware of the fact that viral infection can't be cured by antibiotics with percentage of (74.29%) and (60%) know antibiotics can speed up recovery of common cold and cough assuming they are bacterial illness. This difference could be attributed to different curriculum between the two groups and difference in sample size.

Majority of the interns (93 %) in the present study believed that excessive use of antibiotic leads to emergence of antibiotic resistance. For the question "Excessive use of antibiotics leads to emergence of antibiotic resistance" as presented in Table (3). The finding was higher than final year students of Bachelor of Medicine, Bachelor of Surgery (MBBS) (78.94%), Bachelor of Dental Surgery (BDS) (70.83%) and bachelor of science in nursing (BSc) (58.10%) in a study done by (Dutt et al., 2018)⁽¹²⁾ such difference is most probably due to the difference in sample size.

Almost (78.9%) of Interns asked their patients before prescribing antibiotics as presented in table (6), If they took antibiotics one week before visiting outpatient clinic. This agrees with a similar study by (Mansour et al., 2018)⁽¹¹⁾ which revealed (86.9%) of dentists did the same. This could be due to more experience gap between dentists and interns.

As regards question 13 (69%) of interns choose to perform drainage and give antibiotics as presented in table 8. In similar study by (Konde et al., 2016)⁽⁷⁾ the majority of the pediatric dentists (90%) performed incision and drainage followed by antibiotic coverage in contrast to only (22%) BDS practitioners. This difference in results could be due to experience difference between interns and pediatric dentists specialists.

In the current study, it was found that (25.4%) of interns relied on amoxicillin and amoxicillin+clavulanic acid as the first choice as presented in Table (10), which was lower than similar study done in France by (Baudet et al., 2020) who stated that most of French dentists used amoxicillin with (65.8%). In French guidelines amoxicillin is the antibiotic of choice for

oral infections so it was clear why they stick to it but for the dental interns it was the easiest choice and the most common for them.

In the presence of an anaerobic infection, the prescription pattern varied; 62% of interns, relied on Flagyl. This result is higher than similar study by (Baudet et al., 2020)⁽¹³⁾ with percentage of (11.6%). This difference in results may be attributed to smaller sample size for the current study.

However, the current study showed higher total KAP with moderate score in male interns with (82.4%) than female Interns with (75.7%) as presented in Table (12). This disagree with (Tevatia et al., 2016)⁽²⁾ who found higher total KAP scores in females. Because females may tend to stick to regulations and rules more than males.

Limitations

In this study some limitations were detected as the limited sample size in this study might have failed to represent the entire population of dental interns. Also the administration of a cross-sectional questionnaire may have introduced bias whereby student's practices may reflect those of their mentors, which may or may not be truly evidence-based. Self-reported practice questionnaires may overestimate real practices. Responders may report answers which they believe the authorities want to hear. Therefore, there should be more studies concerned with antibiotic practices.

Conclusions

It was concluded that Participants were well aware of the issue of bacterial resistance. Their practices demonstrated varying degrees of deviation from the AAPD's antibiotic prescription recommendations, especially in the form of over-prescriptions in instances when antibiotics were unnecessary. Moreover, these measures may directly contribute to the problem of antimicrobial resistance.

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