

# Knowledge, Attitude, and Practices of Practitioners Towards Antibiotic Prescription for Infection Prevention during Dental Procedures

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## Abstract:

**Background:** In the past few decades, the resistance to antibiotics has risen tremendously and has become a major problem to the world's overall well-being. Antibiotics and analgesics are frequently used in dentistry practice for both prevention of infection and alleviating discomfort. The Dental professionals' knowledge, attitudes, and prescription-writing abilities ought to be continually assessed. The purpose of the research was to evaluate dental professionals' knowledge, attitudes, and practices surrounding the administration of antibiotics.

**Methodology:** To ascertain dental professionals' knowledge, attitudes, and practices concerning the administration of antibiotics, a cross-sectional descriptive research study was conducted. Data was gathered using an anonymous survey that was adapted from earlier investigations. Everyone who participated received an overview of the research's purpose and instructions on how to fill out the online survey form. Information was gathered upon submission of the survey responses and was evaluated, organized, reported as measurements or proportions, and statistically analyzed using SPSS version 26.

**Results:** A total of 120 dental professionals were part of this research. The majority of them were males with more than 5 years of experience. Although a large proportion of the subjects in the present investigation had an extensive understanding (78.3%) of the issue of antibiotic resistance, they were nevertheless administering antibiotics without following the correct procedures in this investigation.

**Conclusion:** Dental professionals were aware of the prevalence of antibiotic and resistance, but they continued to prescribe antibiotics despite following the correct protocols. It is regarded vital to improve antibiotic prudence and upgrade understanding.

**Keywords:** Dental professionals, Knowledge, Antibiotics, Prescription

## Introduction:

Subsequently, Alexander Fleming developed penicillin in 1928 and Howard Walter Florey initially utilized it in hospitals in 1935, antibiotics have come to be extensively utilized in pediatric and adult populations. During a period of time, there has occurred a spike in the number of specified daily allowances of antibiotics consumed globally, particularly in nations with low or middle incomes where utilization of antibiotics has been discovered to be significantly greater than in advanced economies [1].

Antibiotics have proved completely successful in causing more deaths and illnesses globally.

The knack of bacteria to adapt and expand in order to defend their own well-being, however, is undermining their initial accomplishment [2]. This allows bacteria to counteract the curative properties of antibiotics. The growth of pathogens capable of resisting antibiotics is becoming a serious hazard to the general population in modern times. This warning is merely a forecast for the years to come but a present discovery that affects every corner of the globe, affecting seven million

fatalities annually and maybe increasing to ten million by 2050 [1, 3].

Many treatments, myths, and medicinal advancements that were made throughout the first quarter of the modern era have shifted medicines from the individual's room to the pharmacy. These developments have in certain instances challenged deeply held beliefs about prescribing; in various people, they have cracked up possibilities that were previously unthinkable to medical professionals.

Unfavorable adverse reactions and the formation of varieties of bacteria that are resistant are the consequences of incorrect or excessive usage of antibiotics. This ultimately causes the entire national healthcare program's budgetary burdens to increase.[4] According to UK research, 40% of doctors who administer antibiotics do it a minimum of three times, and 15% do so daily.[5,6] According to another research report, amoxicillin-clavulanate was among the most frequently recommended antibiotic for managing dental illnesses.[7] Prescription of suitable medications, especially antibiotics, is a crucial component of the job of a dental professional, therefore having the right expertise about the effectiveness, expense, and reliability of medications is important.

As a result, dentists must be completely knowledgeable about medications, be aware of the latest developments in the field, and adhere to worldwide standards for medication administration. [8,9] Despite the fact that resistant bacteria are clearly on the rise and expanding research reveals that the dental field lacks the necessary expertise in this area. [10-13]

Consequently, the purpose of the investigation was to evaluate dental professionals' knowledge, attitudes, and practices concerning the administration of antibiotics so that they could continue to grow and stay current.

### Methods:

This was a cross-sectional descriptive questionnaire study that was conducted among Dental practitioners in Udaipur City, Rajasthan, India, in the month of January 2023. An automated access to the survey,

created through forms provided by Google was sent to practitioners in a sample that was selected at random. This prospective research presentation was ensured using the STROBE criteria.

Those dental practitioners from Udaipur who had a Professional degree, gave their agreement to engage in the research, and all fully completed questionnaires were considered. Information privacy and secrecy were guaranteed for every individual who participated. In the present investigation, a self-administered survey was utilized to gather data on dental clinicians' knowledge, attitudes, and practices surrounding the prescription of antibiotics. The survey questions were adapted from other studies. [14,15]

A convenience group of 30 practitioners was used to assess a structured questionnaire that could be completed by oneself and gather opinions on the survey's general reception with regard to duration and linguistic quality. They provided comments, and the survey didn't need to be changed. The form was determined to have an internal reliability of 0.80, as indicated by Cronbach's score. In accordance with the observations made by a group of five researchers, the overall content validity ratio (CVR) was determined to be 0.87. When face validity was evaluated, it was revealed that 94% of those responding thought the survey's content was simple.

This 30-question autonomous survey was broken up into four sections. data on the respondents' sociodemographic characteristics made up the initial section. The next section featured 10 questions about antibiotic understanding, the subsequent section had 10 inquiries about attitude, and the concluding section had 10 questions about the practice.

Version 26 of the statistical package for social sciences (SPSS) software was used for the data evaluation. P values (equal or 0.05) were used to define the degree of significance limit. We used the ANOVA test to analyze any possible connections between respondents' knowledge, attitudes, and perceptions with their gender, and experience. Frequency and percentages were used to depict the qualitative factors.

### Tables:

**Table 1:** Demographic details for the research respondents.

| <b>Variables</b>                  | <b>Number (N)</b> | <b>Percentage (%)</b> |
|-----------------------------------|-------------------|-----------------------|
| <b>Gender</b>                     |                   |                       |
| Male                              | 85                | 70.8                  |
| Female                            | 35                | 29.1                  |
| <b>Age</b>                        |                   |                       |
| 25-30                             | 45                | 37.5                  |
| 31-45                             | 50                | 41.6                  |
| More than 45                      | 25                | 20.8                  |
| <b>Working Experience (Years)</b> |                   |                       |
| Less than 2 years                 | 20                | 16.6                  |
| 2-5 years                         | 40                | 33.3                  |
| More than 5 years                 | 60                | 50                    |

**Table 2:** Practitioner's knowledge of antibiotic use

| <b>Knowledge</b>                                                                       | <b>Correct response n (%)</b> |
|----------------------------------------------------------------------------------------|-------------------------------|
| <b>Antibiotics are effective against all germs.</b>                                    | 110 (91.6)                    |
| <b>The unnecessary use of antibiotics can make the bacteria stronger against it.</b>   | 90 (75)                       |
| <b>The same antibiotic can be used in adults as well as children.</b>                  | 115 (95.8)                    |
| <b>When taken often, antibiotics are less likely to work in future</b>                 | 98 (81.6)                     |
| <b>Antibiotics can kill the bacteria that are usually present in our body</b>          | 96 (80)                       |
| <b>Antibiotic resistance is the ability of microbes to resist the effect of drugs.</b> | 94 (78.3)                     |
| <b>Antibiotics speed up recovery from most of the cough and cold.</b>                  | 98 (81.6)                     |
| <b>Amoxicillin is a safe antibiotic product for pregnant patients</b>                  | 90 (75)                       |

|                                                                                            |           |
|--------------------------------------------------------------------------------------------|-----------|
| <b>Antibiotics should not be prescribed for upper respiratory tract infections</b>         | 65 (54.1) |
| <b>Antibiotics can be prescribed to breastfeeding women</b>                                | 78 (65)   |
| <b>The use of antibiotics among animals can reduce the effect of antibiotics on humans</b> | 84 (70)   |

**Table 3:** Dental Practitioner's Attitude toward antibiotic prescription

| S. no | Variables                                                                                                                                                  | Strongly disagree | Disagree  | Neutral   | Agree     | Strongly agree |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|-----------|-----------|----------------|
| 1     | Antibiotic resistance is a problem in Udaipur                                                                                                              | 28 (23.3)         | 45 (37.5) | 18 (15)   | 23 (19.1) | 6 (5)          |
| 2     | It is good to keep antibiotic stocks at the clinic                                                                                                         | 26 (21.6)         | 51 (42.5) | 23 (19.1) | 15 (12.5) | 5 (4.1)        |
| 3     | Skipping one or two doses does not contribute to the development of antibiotic resistance                                                                  | 15 (12.5)         | 50 (41.6) | 23 (19.1) | 23 (19.1) | 9 (7.5)        |
| 4     | When patients have a cough and sore throat, antibiotics are the first drug of choice for early treatment and to prevent the emergence of resistant strains | 20 (16.6)         | 60 (50)   | 10 (8.3)  | 20 (16.6) | 10(8.3)        |
| 5     | Improper prescribing of antibiotics puts patients at risk                                                                                                  | 2 (1.6)           | 8 (6.6)   | 15 (12.5) | 70 (58.3) | 25 (20.8)      |
| 6     | Improper use of antibiotics has become the main cause leading to bacterial resistance                                                                      | 10 (8.3)          | 20 (16.6) | 8 (6.6)   | 60 (50)   | 22(18.3)       |
| 7     | Antibiotics are safe drugs, hence they can be commonly used as medication                                                                                  | 5 (4.1)           | 15 (12.5) | 23 (19.1) | 51 (42.5) | 26 (21.6)      |
| 8     | Adverse effects of antibiotics are reduced by using more than one antibiotic at a time                                                                     | 6 (5)             | 8(6.6)    | 15 (12.5) | 74 (61.6) | 17 (14.1)      |

**Table 4:** Dental practitioner's practice scores

| Practice                                                                              | Yes<br>n (%) | No<br>n (%) |
|---------------------------------------------------------------------------------------|--------------|-------------|
| <b>I often prescribe antibiotics because the patient expects it.</b>                  | 94 (78.3)    | 26 (21.6)   |
| <b>I often take time to consider carefully whether antibiotics are needed or not.</b> | 100 (83.3)   | 20 (16.6)   |

|                                                                                                                   |            |            |
|-------------------------------------------------------------------------------------------------------------------|------------|------------|
| I instruct the patient every time to complete the course of treatment with antibiotics even if they feel better.  | 85 (70.8)  | 35 (29.1)  |
| I consider general factors (like past drug history, systemic disease, pregnancy etc) before prescribing any drug. | 100 (83.3) | 20 (16.6)  |
| I prescribe antibiotics to pregnant women.                                                                        | 25 (20.8)  | 95 (79.1)  |
| I follow the rational prescription process.                                                                       | 98 (81.6)  | 22 (18.3)  |
| I prescribe antibiotics by their generic name.                                                                    | 25 (20.8)  | 95 (79.1)  |
| I often prescribe antibiotics after normal extractions                                                            | 85 (70.8)  | 35 (29.1)  |
| While prescribing, I take time to instruct the patient regarding the usage of antibiotics.                        | 20 (16.6)  | 100 (83.3) |
| I take a history of drug allergies before prescribing medicines.                                                  | 85 (70.8)  | 35 (29.1)  |

Table 5 – Association of Knowledge, attitude, and practice score with demographic variables

| Variables                 | Knowledge   |         | Attitude    |         | Practice    |         |
|---------------------------|-------------|---------|-------------|---------|-------------|---------|
|                           | Mean ± SD   | P value | Mean ± SD   | P value | Mean ± SD   | P value |
| <b>Gender</b>             |             |         |             |         |             |         |
| Male                      | 12.5 ± 0.78 | 0.02*   | 8.63 ± 0.83 | 0.52    | 6.39 ± 0.59 | 0.6     |
| Female                    | 9.32 ± 2.61 |         | 11.8 ± 2.26 |         | 9.56 ± 2.36 |         |
| <b>Working Experience</b> |             |         |             |         |             |         |
| Less than 2 years         | 7.92 ± 2.10 | 0.03*   | 7.76 ± 1.16 | 0.25    | 7.91 ± 2.50 | 0.3     |
| 2-5 years                 | 9.54 ± 3.05 |         | 8.32 ± 3.15 |         | 9.67 ± 3.22 |         |
| More than 5 years         | 11.9 ± 3.66 |         | 11.7 ± 1.25 |         | 11.8 ± 1.12 |         |

\*indicates statistically significant difference at  $p \leq 0.05$ .

## Results

120 independent dental practitioners in all, 85 (70.8%) of whom were men and 35 (29.1%) of whom were women, engaged in the research project and answered the online survey. The majority of them, 60 (50%) had in excess of five years of job expertise, and 50 (41.6%) were among the ages of 31 and 45. (Table 1) Eighty-one percent (98%) of those surveyed said antibiotics helped individuals recuperate more quickly from colds and coughs. Approximately 110 (91.6%) of those surveyed agreed that antibiotics work against all microorganisms. About 90 people (75%) thought that overusing antibiotics could make bacteria more resistant to them. (Table 2)

A little over 45 (37.5%) of those surveyed believed that antimicrobial resistance is an issue in Udaipur, and almost 60 (50%) disapproved that antibiotics are the first medication preference for cough and throat irritation. A large percentage of the 70 respondents (58.3%) concurred that incorrect antibiotic prescriptions put patients at danger. About 74 (61.6%) people stated that taking more than one antibiotic at once reduces the adverse consequences of antibiotics (Table 3).

According to Table 4, 94 (78.3%) of the 120 dentists polled administered antibiotics since the patient expected them to. The majority of dentists, 100 (83.3%), clearly agreed that fundamental variables (such as previous drug use, chronic illness, pregnancy, etc.) should be taken into account when prescribing

any medication. 95 (79.1%) of those who responded had very good expertise of prescription trademarked antibiotics.

Table 5 demonstrates a favourable correlation between gender and work history and dental clinicians' knowledge. Males possessed considerably more knowledge than females, according to the gender split ( $p=0.02$ ). Clinicians with greater experience had a superior understanding of antibiotic prescription

### Discussion:

Doctors and Dental surgeons must prescribe the right medications, therefore having sufficient information regarding the safety of medications, effectiveness, expenses, and accessibility is crucial. Across the globe, the consumption of medication that is clinically unsuitable, ineffectual, or financially expensive results in resistance to antibiotics along with other negative repercussions. According to this survey, the majority of the dental practitioner's practicing in Udaipur were familiar with the effects of drug resistance.

The present research sheds light on the knowledge, attitudes, and practices of dental practitioners about the prescription of antibiotics and their effects. The knowledge assessments plainly demonstrate the participant's good comprehension. Typically, 91.6% of people had sufficient knowledge, while 50% had the proper mindset. In a related study done by Banerjee et al, it was found that 7.7% of participants had strong knowledge and 11% had the proper attitude. [16] In contrast, a survey done by Awad et al revealed that 46% of them lacked basic knowledge. [17]

In the last few decades, resistance to antibiotics has escalated into a serious global issue. [18] According to the present research, almost all of the 110 participants (95%) were aware of this. This was consistent with research by Konde et al. [19] and Kannan et al. [20]

In the present investigation, 94 (78.3%) patients received antibiotic prescriptions on the basis of their feelings and symptoms rather than recommended treatment methods. In a related investigation by Hammad et al., it was demonstrated that most dental professionals failed to adhere to the correct recommendations for prophylactic antibiotics. [21] This can be the case given that dental professionals are overworked and discover it challenging to stay informed with prescribing practice developments.

Professional expertise typically leads to an increased conviction and greater judgment; yet, for the assessed dentists, a higher level of expertise failed to turn into

more understanding in either the clinical or fundamental scientific domains. This might be because dentists aren't interested in managing oral infections and antimicrobial therapy, aren't exposed to these kinds of situations, or aren't keeping up with the most recent information via classes, publications, or forums.

Some fascinating results emerged from the analysis of attitude answers. A sizable portion of the poll participants still prescribed antibiotics in circumstances where they were not absolutely mentioned, despite the fact that the majority of participants thought that administering antibiotics unduly increased germ tolerance in the population. For instance, 70% of respondents said they would give antibiotics in every case of tooth removal even in the absence of infection; and the most common antibiotic used in this scenario was the amoxicillin/clavulanate combination. This might be explained by the responders' attempts to ward off infection. This is in association with the research conducted among dentists in Saudi Arabia. [22]

The findings of the current investigation showed that dental surgeons wrote prescriptions correctly. This might be due to the fact that the medical prescription written by them can be checked and can get them in trouble if wrongly written. In this method, they are able to write prescriptions more effectively while also checking and fixing any incorrect ones. A large number of professionals stated that they carefully examine the demand for antibiotics and only administer them when necessary. The identical findings were reported in an experiment performed by Paudel et al. [23], who discovered that dental professionals had a moderate propensity for writing prescriptions.

The results of the present research also revealed an undeniable connection or relationship between research respondents' knowledge levels of prudent antibiotic use and gender and work experience. The anticipated results are consistent with what has been observed in earlier regional research. [14,15] No connection or association was observed between dental practitioners' attitudes and practice with gender and work experience.

The study's findings demonstrated that although dental professionals had a strong knowledge of prescribing medications, there was a lack of attitude answers but when it came to practice, proper prescription patterns can be seen. Additionally, since the anonymous survey

was carried out and information was collected in a single city, it's likely that participants who completed the survey can cause internal bias. Additionally, just one province received the study's administration. Due to the city's extensive network of districts and tehsils, it might not be possible to generalize these findings to the entire populace. On this topic, more research is advised, taking a peek at numerous districts, tehsils, and regions with identical or distinct resident attributes.

### Conclusion:

The current results represent a beginning towards establishing an empirical foundation of antibiotic consumption trends, knowledge, attitudes, and practices concerning antibiotics for preventing infections among dental professionals. In analyzing the information, it was found that the respondents with a little greater percentage of negative attitudes had an average of sufficient knowledge and practices. But as one of the primary contributors to the rise in antimicrobial resistance is the unjustified prescription of antibiotics for any type of sickness, grave concerns like this should be avoided. Consequently, according to the findings of the current study, dental professionals in Udaipur are knowledgeable about prescribing antibiotics, yet there is undeniable room for improvement in dentists' education and attitudes toward antibiotic recommendations. In order to improve their use of antibiotics, dental professionals ought to review them over the term.

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