

# Psychological Assessment before Antibiotic Prescription: A Questionnaire Study!

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## ABSTRACT

**Introduction:** Antibiotic resistance is a public health problem of increasing magnitude. It is an economic burden on the healthcare system. Resistant infections not only expensive to treat, but also can prolong healthcare use. The present study emphatically demonstrates the current issues related to the overwhelming concerns regarding indiscriminate use of antibiotics, leading to a bleak tomorrow where cures may be few.

**Aim:** The aim was to know the prescription pattern of antibiotics for various dental procedures by dental practitioners.

**Materials and Methods:** A self-administered, 10-item close-ended questionnaire was used. Questionnaire consisted of two parts, the first part consisted of demographics variables and the second part consisted of questions pertaining to knowledge, attitude, and practice of dental health care professionals before prescribing antibiotics. Associations were found out via the Chi-square test with  $P$  value kept as  $P \leq 0.05$ .

**Results:** With a response rate of 69.76%, medical representatives, patients' preference, a fear of loss of patients and fear of spread of infections can potentially "influence" a dentist's capability to prescribe antibiotics.

**Conclusion:** The dental profession as a whole needs to acquire a deeper understanding of the global effects of superfluous antibiotic prescription. Antibiotics, when judiciously used, are precise life-saving drugs. Proper knowledge about the prescription of antibiotics is the need of the hour. As a nation, we must respond to this growing problem so that antibiotics misuse can be stopped.

**Keywords:** Antibiotic prescription, Dentists, Misuse

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## INTRODUCTION

In the year 2011, the World Health Organization aptly set its theme as "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow" to check the overuse and over prescription of antibiotics that has led to the emergence of antibiotic resistance.<sup>1</sup> This theme portrays a serious and global problem of "antibiotic abuse" with a growing consensus to urgently develop new strategies for prevention of resistance of bacteria to antibiotics.<sup>2</sup> In the last few decades, various medical professions, including the dental profession have experienced a rapid and dramatic increase in the therapeutic use of antibiotics required for the treatment of different infections and conditions.<sup>2</sup>

In the field of dentistry, antibiotic prescription is mostly for prophylactic use for life-threatening diseases and prevention of postoperative infections. There are different opinions regarding antibiotic prophylaxis of healthy patients, but it is an important criterion medico-legally and for those who are medically compromised.<sup>3</sup> The year 1998 was an important landmark as the Standing Medical Advisory Committee published "The Path of Least Resistance," which stated that dentists account for 7% of all community prescriptions of antimicrobials. Simply put in numbers, it means that in the United Kingdom alone, dentists dispensed 3.3 million antibiotic prescriptions in the year 1993, which had increased to 3.5 million by the year 1996.<sup>4</sup> Another study in the United Kingdom states that

dentists were prescribing 159 antibiotic courses each year on an average, which roughens out to at least three prescriptions in a week.<sup>5</sup>

There is evidence that general dental practitioners are overusing prophylactic antibiotics, and there remains a clear-cut need for guidelines in order to reduce inappropriate prescribing.<sup>6</sup> Literature did not reveal any study pertaining to the antibiotic prescription pattern and contribution of dentists to the development of antimicrobial resistance in India. Therefore, this study aims to know the prescription pattern of antibiotics by dental practitioners and to reduce the misuse of antibiotics through a psychological assessment among the dental health care professionals of various dental colleges in the National Capital Region (NCR) around New Delhi.

## MATERIALS AND METHODS

During the period from May 1, 2013 to October 31, 2013, all the dentists working in various dental colleges of the NCR were invited to participate in the study. Participation was voluntary, and confidentiality of the data was assured to the participants. Prior to the conduction of the study, and ethical clearance was obtained from the parent institution. Any dentist with a minimum qualification of a BDS degree was included in the study.

Data collection was carried out through a self-administered, pre-tested and pre-validated 10 item close-ended questionnaire, distributed personally to various dental colleges in Delhi NCR after obtaining proper permission from the concerned institutions.

The questionnaire consisted of two parts. The first part consisted of demographic variables of the respondents, and the second part consisted of questions pertaining to knowledge, attitude and practice of dental health care professionals before prescribing antibiotics.

Descriptive statistics was used to calculate frequencies and the Chi-square test was applied to explore any association between demographics and behavioral variables. Statistical significance was kept as  $P < 0.05$ . Data analysis was performed using SPSS Version 21.0 (IBM software).<sup>7</sup>

## RESULTS

Of the 215 questionnaires distributed, 150 volunteered to be a part of the study thus making the response rate as 69.76% that was satisfactory. Our sample of the dentists was comprised of 105 males and 45 females. The

demographic variables, which were the first part of the questionnaire, are described in Table 1.

The respondents had minimum BDS Qualification to be included in the study. Respondents comprised of 92 staff and 58 students (some were doing Post Graduation and had their own clinics as well) out of which were 45 BDS and 105 were MDS and a majority of them (119) had an experience of at least 5 years of clinical practice.

Data processing was done by categorizing the data into four groups. It was on the basis of sex and antibiotic prescription, the second on the basis of designation (staff/student), the third on the basis of academic qualification (BDS/MDS) and fourth on the basis of duration of private practice. Tables 2 and 3 describe the responses of different categories to each answer of the questionnaire. As shown in Table 3, based on gender, question "Do you fear the spread of an infection just because you have not prescribed antibiotics?" revealed a statistical significance between both males and females. When it came comparing on the basis of designation in Table 3, there were five questions that revealed a statistical significance. In Table 3, which assessed antibiotic prescription on the basis of academic qualification also showed a statistical significance only in one question, which was "Do you have a fear of loss of patients, when you don't prescribe antibiotics?."

In Table 2, the questions were assessed on the basis of the clinical experience of the dentists, and there were five questions that were found to be statistically significant.

## DISCUSSION

Our study showed very important and significant finding when considering antibiotic prescription

**Table 1: Demographic and professional characteristics of participating dentists in the study**

Variable	N (%)
Gender	
Male	105 (70)
Female	45 (30)
Designation	
Staff	92 (62)
Student	58 (38)
Qualification	
BDS	45 (15)
MDS	105 (85)
Private practice	
0-5 years	28 (19)
5-10 years	41 (27)
>10 years	50 (33)
Nil	31 (21)

**Table 2: Response rate of clinicians according to experience**

Questions	Response	Overall	0-5 years	5-10 years	>10 years	Nil
1. Do you feel overdose of prescription of antibiotics can lead to resistance?	Always	Yes=140 (93.33)	7 (25)	13 (32)	23 (46)	14 (45)
	Occasionally	No=10 (6.66)	20 (72)	28 (68)	26 (52)	14 (45)
	Never		1 (3)	0	1 (2)	3 (10)
2. Do you keep yourself updated by reading any latest scientific material prior to the use of antibiotics in dentistry?	Yes	Yes=137 (91.32)	6 (21)	17 (41)	35 (70)	11 (35)
	No	No=13 (8.66)	22 (79)	24 (59)	15 (30)	20 (65)
3. Does your antibiotics prescription depends upon patient preference?***	Always	Yes=110 (73.32)	4 (15)	6 (15)	3 (6)	14 (46)
	Occasionally	No=40 (26.66)	23 (83)	28 (68)	22 (44)	15 (48)
	Never		1 (2)	7 (17)	25 (50)	2 (6)
4. Are your prescriptions influenced by advertisements (Free samples/Med representatives)?**	Always	Yes=115 (76.66)	3 (10)	3 (8)	1 (2)	7 (24)
	Occasionally	No=35 (23.33)	22 (80)	19 (46)	34 (68)	21 (67)
	Never		3 (10)	19 (46)	15 (30)	3 (9)
5. Do you prescribe because the patients wants the drugs?***	Always	Yes=86 (57.32)	1 (3)	2 (4)	1 (2)	14 (45)
	Occasionally	No=64 (42.66)	7 (25)	4 (9)	4 (8)	13 (42)
	Never		20 (72)	35 (87)	45 (90)	4 (13)
6. Do you have a fear of loss of patients, when you don't prescribe antibiotics?	Always	Yes=57 (38)	5 (18)	6 (14)	4 (8)	16 (51)
	Occasionally	No=93 (62)	4 (14)	5 (13)	7 (14)	10 (33)
	Never		19 (68)	30 (73)	39 (78)	5 (16)
7. Do you fear the spread of an infection just because you have not prescribed antibiotics?	Always	Yes=117 (78)	2 (8)	6 (15)	8 (16)	7 (22)
	Occasionally	No=33 (22)	22 (78)	25 (60)	33 (66)	19 (62)
	Never		4 (14)	10 (25)	9 (18)	5 (16)
8. Do you take past dental/medical history of consumption of antibiotics before prescribing antibiotics?***	Always	Yes=130 (86.66)	6 (22)	36 (88)	35 (70)	8 (25)
	Occasionally	No=20 (13.33)	17 (61)	3 (8)	5 (10)	20 (65)
	Never		5 (17)	2 (4)	10 (20)	3 (10)
9. Do you prescribe antibiotics depending upon its cost?	Always	Yes=118 (78.66)	6 (22)	5 (12)	7 (14)	8 (26)
	Occasionally	No=32 (21.33)	19 (68)	28 (68)	35 (70)	20 (65)
	Never		3 (10)	8 (20)	8 (16)	3 (9)
10. Do you write the drug brand/ market name or the content name in the prescription?***	Brand name	Brand name and content name=110 (73)	4 (15)	27 (65)	35 (70)	2 (7)
	Content name	Both=40 (26.66)	17 (60)	6 (15)	8 (16)	21 (68)
	Both		7 (25)	8 (20)	7 (14)	8 (25)

\*P&gt;0.05, \*\*P&gt;0.01, \*\*\*P&gt;0.001

habits among dentists of Delhi NCR. In our study, we collected data through 10 close-ended questions that discussed factors that influenced the dentist's decision on prescription of antibiotics. It was seen that majority of dentists (93.33%  $n = 140$ ) agreed that overdose of prescription of antibiotics can lead to resistance and many of them (91.32%  $n = 137$ ) regularly keep themselves updated by reading any latest scientific material prior to the use of antibiotics in dentistry (Table 2). This statement is in agreement to Karibasappa and Sujatha who in their study found out that approximately 90% of the dentists were aware of the term "antibiotic resistance" and knew that injudicious prescription pattern among health professionals and self-medication with antibiotics inappropriately were contributing to the emergence of antibiotic resistance around the globe.<sup>8</sup> It was observed that majority of dentists (73.32%  $n = 110$ ) agreed that they prescribed antibiotics depending upon patient preference, and most of them (76.66%  $n = 115$ ) agreed that their prescriptions were influenced by advertisements/medical representatives as well as (78.66%  $n = 118$ ) agreed to the fact that they prescribe antibiotics depending

upon cost, which was similar to other studies in which comparison between certain factors related to patient preference, any prescriptions that were influenced by advertisements and medical representatives as well as the cost of the antibiotic were seen in studies done by several authors doing research on the same topic of "antibiotic abuse."<sup>9-12</sup>

When the dentists were asked whether their prescriptions were influenced by advertisements (free samples/medical representatives) (Tables 2 and 3), we observed a statistical significance between staff and student, which was also uninfluenced by the years of clinical practice of the dentist. It is in agreement to various studies carried across the globe that is influenced by a medical representative is one of the "external" factors that influence the antibiotic prescription ability of the doctor.<sup>13-18</sup> However, in contradiction to these findings, Chimonas *et al.* (2007) in their study reported that physicians "denied" being influenced by medical representatives.<sup>19</sup> It was observed that only (38%  $n = 57$ ) in Table 3 agreed that they prescribe antibiotics due to a fear of loss of patients. It is possible

**Table 3: Different response rate of dentists according to gender, qualification and designation**

Questions	Response	Male (%)	Female (%)	Staff (%)	Student (%)	BDS (%)	MDS (%)
1. Do you feel overdose of prescription of antibiotics can lead to resistance?	Always	57 (54.2)	20 (44.4)	46 (50)	15 (25.8)	23 (51.1)	34 (32.3)
	Occasionally	46 (43.8)	17 (37.7)	42 (45.6)	36 (62.06)	15 (33.3)	61 (58.09)
	Never	02 (1.9)	08 (17.7)	04 (4.3)	07 (12.06)	7 (15.5)	10 (9.5)
	Total	105	45	92	58	45	105
2. Do you regularly keep yourself updated by reading any latest scientific material prior to the use of antibiotics in dentistry?	Always	32 (30.4)	21 (46.66)	41 (44.5)	18 (31.03)	19 (42.2)	50 (47.6)
	Occasionally	65 (61.9)	19 (42.22)	51 (55.4)	40 (68.96)	26 (57.7)	55 (52.3)
	Never	08 (7.6)	05 (11.11)	92	58	45	105
	Total	105	45				
3. Does your antibiotics prescription depends upon patient preference?	Always	19 (18.09)	03 (6.66)	36 (39.13)	07 (12.06)	13 (28.8)	14 (13.33)
	Occasionally	62 (59.04)	26 (57.7)	53 (57.6)	48 (82.7)	29 (64.4)	69 (65.71)
	Never	24 (22.8)	16 (35.5)	03 (3.2)	03 (5.17)	3 (6.66)	32 (30.47)
	Total	105	45	92*	58*	45	105
4. Are your prescriptions influenced by advertisements (Free samples/Med representatives)?	Always	21 (20)	03 (6.66)	05 (5.43)	09 (15.51)	11 (24.44)	13 (12.38)
	Occasionally	61 (58.09)	30 (66.66)	60 (65.2)	46 (79.3)	32 (71.11)	74 (70.47)
	Never	23 (21.9)	12 (26.66)	27 (29.34)	03 (5.17)	2 (4.44)	18 (17.14)
	Total	105	45	92***	58***	45	105
5. Do you prescribe because the patients want the drugs?	Always	10 (9.52)	02 (4.44)	07 (7.60)	01 (1.72)	1 (2.22)	7 (6.66)
	Occasionally	52 (49.5)	22 (48.8)	22 (23.91)	26 (44.8)	32 (71.11)	36 (34.28)
	Never	43 (40.95)	21 (46.6)	63 (68.47)	31 (53.44)	12 (26.66)	62 (59.04)
	Total	105	45	92*	58*	45	105
6. Do you have a fear of loss of patients, when you don't prescribe antibiotics?	Always	19 (18.09)	07 (15.55)	09 (9.78)	12 (20.69)	3 (6.66)	18 (17.14)
	Occasionally	19 (18.09)	12 (26.6)	14 (15.21)	22 (37.9)	39 (86.6)	17 (16.19)
	Never	67 (63.81)	26 (57.7)	69 (75)	24 (41.37)	3 (6.66)	70 (66.66)
	Total	105	45	92*	58*	45***	105***
7. Do you fear the spread of an infection just because you have not prescribed antibiotics?	Always	17 (16.19)	06 (13.33)	13 (14.13)	10 (17.2)	4 (8.8)	19 (18.09)
	Occasionally	59 (56.19)	35 (77.77)	62 (67.39)	37 (63.7)	38 (84.4)	61 (58.09)
	Never	29 (27.61)	04 (8.88)	17 (18.47)	11 (18.96)	3 (6.66)	25 (23.81)
	Total	105*	45*	92	58	45	105
8. Do you take past dental/medical history of consumption of antibiotics before prescribing antibiotics?	Always	46 (43.81)	29 (64.4)	56 (60.87)	19 (32.7)	11 (24.4)	54 (51.42)
	Occasionally	46 (43.81)	09 (20)	33 (35.8)	32 (55.17)	32 (71.1)	41 (39.04)
	Never	13 (12.38)	07 (15.55)	03 (3.26)	07 (12.06)	2 (4.44)	10 (9.52)
	Total	105	45	92*	58*	45	105
9. Do you prescribe antibiotics depending upon its cost?	Always	18 (17.14)	08 (17.77)	12 (13.04)	14 (24.13)	3 (6.66)	23 (21.90)
	Occasionally	68 (64.7)	24 (53.33)	63 (68.47)	39 (67.2)	38 (84.44)	64 (60.95)
	Never	19 (18.09)	13 (28.8)	17 (18.47)	05 (8.62)	4 (8.88)	18 (17.14)
	Total	105	45	92	58	45	105
10. Do you write the drug brand/ market name or the content name in the prescription?	Brand name	29 (27.6)	09 (20)	28 (30.43)	10 (17.24)	7 (15.55)	31 (29.5)
	Content name	50 (47.6)	22 (48.8)	48 (52.17)	34 (58.62)	36 (80)	46 (43.8)
	Both	26 (24.7)	14 (31.11)	16 (17.39)	14 (24.13)	2 (4.44)	28 (26.6)
	Total	105	45	92	58	45	105

\* $P > 0.05$ , \*\* $P > 0.01$ , \*\*\* $P > 0.001$ 

that the above said significant difference between staff and students could be due to the fact that most staff have a private practice of their own and fear legal action if the patient health deteriorates and/or could lead to a loss of patients if antibiotics are not prescribed.<sup>20</sup> This fear of loss of patients was also seen in dentists irrespective of their dental qualification (Table 3). Along with it majority of the dentists (57.32%  $n = 86$ ) agreed to the question that they prescribe antibiotics because patient wants the drug both by staff and students (Table 3).

This basically arrives from a belief of the patient that their ailment was caused due to bacterial infection, and this

provides a stimulus enough for them to ask their doctor to prescribe them an antibiotic.<sup>21,22</sup> It was seen in majority of dentists (78%  $n = 117$ ) fear the spread of infection if they do not prescribe antibiotics and statistically significant differences were also seen among both males and females (Table 3). This may be because they prescribe a broad spectrum antibiotic to protect their patients from any infection that could lead to deterioration of their health that could lead to a loss of their patients.<sup>20</sup> On comparing the antibiotic prescription habits of the dentists based upon the years of clinical practice in Table 2, similar results were achieved regarding antibiotic prescription according to patient preference,

and prescription of antibiotics just because the patient wanted the drug (Table 2), which can be attributed to the above said reasons. Dentists, irrespective of clinical practice (86.66%  $n = 130$ ) undertook a thorough case history and tried to get a sensitivity test prior to antibiotic prescription (Table 2). However, it was found out that majority of the dentists write the drug brand/market name or content name (73%  $n = 110$ ) whereas only (27%  $n = 40$ ) were writing both in the prescription (Table 2) and this, might cost a financial burden to the patient, especially those from low socio-economic groups. This is in agreement to Haas *et al.* (2005), who used data from the 1997-2000 Medical Expenditure Panel Survey's Household Component (Boston, MA), found out that substitution of a generic drug in place of a brand-name of a drug whenever available would have saved approximately \$46 per year for adults younger than 65 years of age and approximately \$78 per year for older adults.<sup>23</sup> This could have led to better savings and affordability to people, especially those belonging to low socioeconomic group, which would help us provide a better service to the community.

Our study however is prone to certain limitations, which are:

- Presence of a social desirability bias by the dentists while answering the questionnaire
- Since students are not exposed to clinical practice, there could be a slight difference in their antibiotic prescription habits when compared to the faculty
- Under-reporting/over-reporting of the answers by the respondents is quite a common feature in questionnaire surveys.

## CONCLUSION

From the above results, it is clear that "antibiotic abuse" is widely prevalent in the region of Delhi NCR and suitable measures should be undertaken to prevent the misuse of antibiotics. It is even dreadful to think what misery humankind should suffer if antibiotic resistant organisms start spreading from one human to another. It's high time that legislation and stringent guidelines be brought into immediate effect to prevent any further antibiotic misuse by physicians and dentists alike. We also suggest the necessity to perform further systematic and extensive research to gain a better understanding regarding the prevailing situation in India about antibiotics, their use, and misuse.

## Recommendations and suggestions

- We suggest that antibiotic prescription guidelines should be framed and that physicians and dentists be educated with those through compulsory CME/CDE programs

- The ban of the sale of antibiotics to the general population without a doctor's prescription
- Stringent actions to be taken against those who do not follow the antibiotic guidelines
- Least/no interaction between medical representatives and dentists should be made so that the dentist's prescription is not "influenced" by external factors
- Drug to be prescribed only on the basis of salt present and no drug name/company should be used or promoted in the prescription.

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**How to cite this article:** Handa S, Prasad S, Tandon S, Bali E. Psychological Assessment before Antibiotic Prescription: A Questionnaire Study!. *Int J Adv Health Sci* 2014;7(1):1-6.

**Source of Support:** Nil, **Conflict of Interest:** None declared.