Original Article

SELF REPORTED FACTORS AFFECTING CHOICE OF PRESCRIPTION OF DRUGS AMONG DENTAL SURGEONS IN PUNJAB PAKISTAN

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Abstract:

Background: To assess the self-reported factors influencing drug-prescribing practices among dental surgeons in Punjab, Pakistan, and to determine the association of formal or refresher training in drug prescription with prescribing behavior.

Material and Methods: This cross-sectional questionnaire-based study was conducted over 9 months (Feb–Nov 2025) among dentists working in three dental institutes in Punjab, after the approval of the IRB of Azra Naheed Dental College, on 300 dentists using convenience sampling. A structured self-administered questionnaire assessed demographics, training, supervision, confidence, and other influencing factors on drug prescription. Data was analyzed using SPSS Version 25. Chi-square test was applied with significance set at $p<0.05$.

Results: A total of 300 dental surgeons participated (mean age: 24.56±1.60 years); 71% were females (n=213). Training in drug prescription had been received by 68% (n=204). Need for supervision was reported "sometimes" by 61% (n=183), with a significant association with training (p=0.004). Confidence in self-prescribing was "somewhat" high in 55.7% (n=167), also significantly associated with training ($p<0.001$). Supervisor influence was high (93.3%; n=280), and degree of influence did not differ significantly between trained and untrained respondents (p=0.181). Pharmaceutical company influence was not significant (p=0.924), but prescribing in response to pharmaceutical representatives was significantly associated with training ($p<0.001$). Influence from fellow colleagues was significant (p=0.019). Other factors, including senior colleagues, self-judgment, books, and internet resources, showed no significant differences.

Conclusion: Formal or refresher training in drug prescription significantly improves confidence, reduces reliance on supervision, and promotes more cautious prescribing behavior, particularly in response to pharmaceutical marketing.

Keywords: Drug Prescriptions; Pharmaceutical Preparations; Prescription Drugs; Pakistan; Self Report

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INTRODUCTION

Drug prescribing is a critical component of safe and effective dental practice. Dental surgeons routinely prescribe analgesics, antibiotics, anti-inflammatory agents etc., for the management of pain, infection, and post-operative sequelae.[1] However, global literature reported considerable variation in prescribing patterns between dentists and across settings, with frequent reports of over-prescription, inappropriate drug selection, and deviation from evidence based guidelines.[2] Inappropriate use of antibiotics and analgesics in dentistry can lead to adverse drug reactions, but

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antimicrobial resistance and healthcare costs.[3] Previous studies have reported patterns of drug prescription in dental outpatient departments and teaching hospitals, highlighting issues such as polypharmacy, preference for brand names, and excessive use of antibiotics.[4-6] These patterns are influenced by a complex interplay of individual, institutional, and external factors.[7] At the individual level, knowledge of pharmacology, clinical experience, competence, and personal attitudes towards risk and uncertainty affect decision making among dentists.[8] External influences such as pharmaceutical marketing, promotion of brands, and interactions with sales representatives also play a significant role and have been associated with changes in prescribing behavior in both physicians and dentists.[9] In dentistry, pain and infection control as the most common reasons for prescribing medication. Studies have shown that dentists frequently prescribe analgesics and antibiotics, sometimes in situations where only local treatment is sufficient.[10, 11] Recent reviews indicate that antibiotic prescriptions are often given as a substitute for to delay operative treatment, and that the dentist choices are influenced by habits formed during training, continuing education courses, and patient expectations.[6, 7] The drug prescription decision making process is multifactorial which is evident from literature and shows that clinicians rely on factors including colleagues, senior faculty, clinical guidelines, textbooks, continuing professional development, and internet.[3] For newer dentists, supervisors, peer influence and senior faculty may strongly shape prescribing behavior, either through directives or by informal norms and expectations in the clinic.[3, 12]. Moreover, dentists with lower pharmacological competence may refer to supervisors, specialist colleagues or drug information by pharmaceutical representatives.[13] Despite increasing interest in dental prescription, few studies have examined the factors of dentist choice of drugs using a structured, questionnaire based approach. Previous studies have quantified drugs prescription, rather than why these choices are made. Moreover, surveys suggest that modifiable factors like reliance on non-evidence based information and pharmaceutical promotion exert a greater influence on prescription.[8, 14, 15] This can help in establishing guidelines and regulatory measures that encourage more rational, patient-center and evidence based drug prescription in dentistry. The present study aims to explore the self-reported factors affecting the choice of prescription of drugs among dental surgeons using a structured questionnaire in Punjab, Pakistan.

MATERIAL AND METHODS

This analytical cross-sectional study was conducted among dental surgeons working in three dental institutes in Punjab, Pakistan where dental surgeons are routinely involved in prescribing medications for dental conditions. The study was approved from the Ethical Review Board of Azra Naheed Dental College (ANDC/RAC/2025/48-A). The institutes involved were Azra Naheed Dental College, Lahore Medical and Dental College, and Institute of Dentistry, CMH Lahore Medical College, The study was carried out over a period of 9 months from February 2025 to November 2025. The study population comprised qualified dental surgeons (BDS or equivalent and above) who were currently involved in clinical practice and were authorized to prescribe medications. The inclusion criteria were dentists and house officers with at least 6 months of clinical experience after graduation, currently practicing during the data collection period and were willing to consent to be a part of the study. The exclusion criteria were interns or undergraduate students not independently prescribing drugs, dentists exclusively in administrative or non-clinical roles and non-respondents after two contact attempts by focal persons. The minimum sample size of 216 was calculated for this cross-sectional survey using Cochran's formula for proportions: $n=Z^2 p(1-p)/d^2$, with a 90% confidence level, a margin of error of 5% (d=0.05), and anticipated frequency of 27.5%.[3] To compensate for potential non-response and incomplete questionnaires, the calculated sample size was raised to 300 dentists. The data was collected using convenience sampling technique. Data was collected using a structured, self-administered questionnaire developed after reviewing relevant literature on dental and medical prescribing behavior and adapted from existing surveys where applicable. The questionnaire had three sections, **s**ocio-

demographic, sources of information and supervision-related factors, and other related factors. The formal or refresher training in drug prescription included structured lectures or workshops during clinical years (i.e., final year and house job), focusing on pharmacology, drug prescribing, and safe antibiotic use. The questionnaire was distributed via WhatsApp by contacting a focal person from each institute who circulated the link of the questionnaire in the groups of the dentists with repeated reminders within their institutes. Informed consent was mentioned in the questionnaire. Completed questionnaires were downloaded in excel sheets. Data was imported into IBM SPSS Statistics Version 25 (IBM Corp., Armonk, NY, USA) for analysis. Descriptive statistics were used to summarize socio-demographic characteristics and responses to individual questionnaire items. Chi-square test was applied to compare categorical variables and when expected frequencies were <5, Fisher's exact test was applied. A p-value<0.05 was considered statistically significant.

RESULTS

A total of 300 dental surgeons participated in the study. The mean age of respondents was 24.56±1.60 years. The demographical data and prior experience of refresher training course on drug prescription is exhibited in Table 1.

Table 1. Demographic characteristics of participants (N = 300)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	87	29.0
Female	213	71.0
Departments		
Prosthodontics	24	8.0
Surgery	60	20.0
Operative Dentistry	61	20.3
Diagnostics	61	20.3
Periodontology	57	19.0
Pedodontics	14	4.7
Orthodontics	23	7.7
Refresher course/training of drug prescription in clinics		
Yes	204	68.0
No	96	32.0

A majority of dental surgeons sometimes needed supervision when prescribing drugs (61%; n=183). There was a significant difference between those who were taught or had refresher course in drug prescription during clinics regarding need for supervision (p=0.004) More than half of participants reported feeling somewhat confident (55.7%; n=167) prescribing a drug independently. Moreover, there was a significant difference between those who were taught or had refresher course in drug prescription during clinics regarding confidence after self-prescribing (p<0.001).

Table 2. Comparison of prescription-related behaviors between dentists who received formal / refresher training in drug prescription and those without such training

Category	n (%)	Received training n (%)	Not Received training n (%)	χ^2	p-Value
Need for supervision					
Always	63 (21)	28 (9.3)	35 (11.7)	19.31	0.004
Sometimes	183 (61)	63 (21)	120 (40)		
Rarely	52 (17.3)	5 (1.6)	47 (15.7)		
Never	2 (0.7)	0 (0)	2 (0.7)		
Confidence in self-prescribing					
To a great extent	82 (27.3)	8 (2.7)	74 (24.6)	45.49	<0.001
Somewhat	167 (55.7)	65 (21.7)	102 (34)		
Very little	47 (15.7)	19 (6.3)	28 (9.4)		
Not at all	4 (1.3)	4 (1.3)	0 (0)		

Analysis of influence-related factors revealed several important patterns regarding the prescribing behavior of dental surgeons in relation to whether they had received formal training or refresher teaching in drug prescription. Overall, supervisory influence remained high across both groups, although the association between receiving training and

simply feeling influenced by a supervisor was not statistically significant (p=0.074). Moreover, when the *degree* of influence was evaluated, no significant association was observed (p=0.103), indicating that those without refresher training were more likely to report stronger supervisor influence (senior faculty or clinical supervisors) compared to those who had received training (Table 3). Influence from pharmaceutical companies did not differ significantly between trained and untrained respondents (p=0.924), and the degree of such influence was similarly nonsignificant (p=0.406). Despite this, prescribing behavior in response to pharmaceutical marketing showed a strong and significant association with training status (p<0.001). Respondents without training were more likely to "always" or "sometimes" prescribe drugs promoted by pharmaceutical representatives, whereas those who had received training demonstrated more cautious prescribing patterns (Table 3). Additionally, reliance on fellow colleagues as a major factor influencing drug choice showed a significant association with training (p=0.019), suggesting that dentists lacking refresher training in drug prescription tended to depend more on peer opinions. Factors such as senior colleagues, self-judgment, pharmaceutical companies, supervisors, and internet resources did not show statistically significant differences between trained and untrained groups. Books as a major influencing factor approached significance (p=0.052), indicating that trained respondents were somewhat more likely to consult textbooks. Overall, the results indicate that formal or refresher training in drug prescription enhances independent decision-making, reduces reliance on non-evidence-based sources, and is associated with more cautious prescribing behavior in response to pharmaceutical promotion (Table 3).

Table 3: Influencing factors and their comparison between those who received refresher training and those who did not

Category	n (%)	Received training *(Yes)*	No training *(No)*	χ^2	P-Value
Supervisor					
Yes	280 (93.3)	194 (64.7)	86 (28.6)	3.19	0.074
No	20 (6.7)	10 (3.3)	10 (3.3)		
Degree of influence by supervisor					
High/ Moderate Influence	261 (87.0)	181 (60.3)	80 (26.7)	1.96	0.181
Low/No influence	39 (13.0)	23 (7.7)	16 (5.3)		
harmaceutical companies					
Yes	98 (32.7)	67 (22.3)	31 (10.3)	0.009	0.924
No	202 (67.3)	137 (45.7)	65 (21.6)		
Degree of influence by pharmaceutical companies					
Influenced	93 (31.0)	58 (19.3)	35 (11.7)	1.67	0.202
Low/No influence	207 (69.0)	146 (48.7)	61 (20.3)		
Pharma representative					
Frequently influenced	191 (63.7)	146 (48.7)	45 (15.0)	**17.20**	**<0.001**
Rarely/ Never influenced	109 (36.3)	58 (19.3)	51 (17.0)		
Fellow colleagues					
Yes	109 (36.3)	65 (21.7)	44 (14.7)	**5.51**	**0.019**
No	191 (63.7)	139 (46.3)	52 (17.3)		
Senior colleagues					
Yes	207 (69.0)	135 (45.0)	72 (24.0)	2.38	0.123
No	93 (31.0)	69 (23.0)	24 (8.0)		
Self-judgment					
Yes	178 (59.3)	118 (39.3)	60 (20.0)	0.587	0.444
No	122 (40.7)	86 (28.7)	36 (12.0)		
Clinical Supervisor					
Yes	215 (71.7)	147 (49.0)	68 (22.7)	0.048	0.826
No	85 (28.3)	57 (19.0)	28 (9.3)		
Internet					
Yes	113 (37.7)	82 (27.3)	31 (10.3)	1.74	0.187
No	187 (62.3)	122 (40.7)	65 (21.7)		
Books					
Yes	88 (29.3)	67 (22.3)	21 (7.0)	3.79	0.052
No	212 (70.7)	137 (45.7)	75 (25.0)		

DISCUSSION

In the present study, 68% dentists reported that they had received a refresher training or refresher course in drug prescription before or

during clinics, while 32% did not, which suggests that most fresh dentists are engaged in some level of prescription training activity. Recent studies suggest that targeted training in drug prescription has reportedly improve prescribing ability and confidence of dentists.[2, 11, 13] A previous study found that targeted education and a prescribing tool among Australian dentists achieved a significant reduction in unneeded antibiotic prescriptions (44.6%) and overall antibiotic use (40.5%).[11] It has been reported that a single training session can have significant improvement.[16] In the current study, one third dentists without refresher course or training before entering clinics indicate a need for repeated training sessions, workshops etc., before prescribing in clinics. The current study reported that 61% of respondents "sometimes" needed supervision when prescribing drugs, with 21% "always" needing supervision with a significant difference between those who had training and those who did not. The dentists with training required less supervision, which aligns with the findings reporting that training improves self-efficacy and need for supervision.[3, 11, 13] A qualitative study on antimicrobial prescription in dental settings identified "beliefs about capabilities" and "access to resources" as key factors on prescribing behavior.[17] The findings of the current study shows that formal training enhances dental knowledge and confidence to prescribe independently. In the current study, more than half of participants (55.7%) felt "somewhat confident" prescribing a medicine independently with a significant difference between trained vs untrained dentists, which was in agreement with the previous literature indicating that targeted education improves competency of prescription writing.[3, 11, 16] A systematic review reported that knowledge gaps correlate with less evidence-based prescribing.[18] The formal or refresher training before entering clinics significantly improves prescribing confidence among dentists, which in turn can promote more autonomous, efficient and focused drug prescription. The study reported that 93.3% participants felt influenced by supervisors, but there was no significant between training status. However, untrained dentists were more likely to be influenced when it comes to the extent of influence. Previous studies on dental and medical prescribing report that peer norms, hierarchical influence, and organizational expectations affect decision-making.[19] Therefore, supervisory influence a persuasive factor, but receiving formal training can reduce the extent of that influence.[3, 20] This study showed no significant difference between trained and untrained dentists in terms of being influenced except when it comes to pharma representatives and fellow colleagues with untrained respondents more likely to prescribe such promoted drugs. These findings were consistent with the previous literature reporting that pharmaceutical representatives are positively associated with increased prescription of the products of that company deviating from evidence based choices.[21, 22] Moreover, in this study, the fellow colleagues were a major influencing factor in drug prescription and it was significantly reported in untrained dentists. Other factor like senior colleagues, self-judgment, supervisors, and internet resources did not show significant differences. Consulting books showed significance difference with trained dentists more likely to consult textbooks. These findings were in agreement with the previous literature showing textbook learning as influencing factors, however, very limited data is available regarding peer influence in drug prescription.[23, 24] The significant differences between dentists who had refresher courses or training in prescription and those who did not, suggest that standardized education in drug prescription should be integrated into undergraduate dental curricula during clinic al years and reinforced through continuous professional development at level of house job and final year where they actually and initially have to write prescriptions. Moreover, mentorship and clinical leadership need to shift toward promoting critical thinking and independent decision making rather than directive behavior.

CONCLUSION

Dental surgeons who received refresher training/courses on drug prescription were significantly less dependent on supervision during clinics, exhibited higher confidence in independently prescribing medications, and showed lower pharmaceutical promotional influence. These findings highlight the value of refresher trainings and workshops, continuing professional development and institutional support especially in clinical years (final year

and house job) in strengthening rational prescribing in dental clinics.

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CONFLICT OF INTEREST

None

AUTHOR'S CONTRIBUTION

HH: Conception and design
SF: Analysis and interpretation of the data
AS: Critical revision of the article for important intellectual content
MH: Collection and assembly of data, Data analysis,
SUK: Critical revision of the manuscript
SH: Data curation

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