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Original Article

Effect of Refresher Workshops on Prescription Writing Skills of Young Dental Practitioners

Saira Bibi, Hina Mahmood, Resham Hafeez*, Zara Bakhtawar Raja, Faiza Haquaid, Kanwal Shehzadi**

Department of Dental, Islamabad Medical and Dental College, Islamabad Pakistan, *Department of Dental, Avicenna Dental College, Lahore Pakistan, **Department of Statistics, Quaid -i-Azam University, Islamabad Pakistan

ABSTRACT

Objective: To quantitatively evaluate the pre session, post session and short-term impacts of a refresher workshop intervention on the prescription writing skills of young dental practitioners.

Study Design: Quasi-experimental study.

Place and Duration: Islamabad Dental College (IDH), Islamabad Pakistan, from Oct to Nov 2023.

Methodology: A study among 63 young dentists was initiated. Participants were tasked with generating a prescription for a clinical case, both before and after undergoing a prescription-writing workshop. The study employed a within-subjects design, allowing for a comparison of participants' performance before and after the workshop. The collected prescriptions from both pre- and post-workshop assessments were compared to evaluate the immediate and short term (after one month) effects of the intervention.

Results: Drug's correct name and frequency was the most common record in the prescriptions. Drug's correct route of administration was less than 2.0% of the prescriptions. None of the prescribers mention drug's correct instructions prior to workshop. Both components increase to 42.9% and 65.1% immediately after workshop. Results demonstrated significant difference in scores across all three assessments of prescriptions (p<0.001).

Conclusions: The positive impact of the refresher workshop suggests its effectiveness in improving prescription-writing skills among young dentists. The study's results serve as a reference for future research, emphasizing the inadequacy of current academic curricula in addressing prescription-writing skills comprehensively.

Keywords: Dentistry, Dentists, Drug Prescriptions, Education.

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INTRODUCTION

Dental professionals require a strong foundation in practical skills and knowledge, complemented by the core skill of prescription writing which translates from Latin word 'praescriptus' as "to write or to dictate".[1] The curriculum of dental colleges focuses strongly on development of practical skills and their theoretical foundations. However, this may inadvertently overshadow the critical skill of adequate prescription writing.[2] A prescription is 'a written order, which includes detailed instructions of what medicine should be given to whom, in what formulation and dose, by what route, when, how frequently, and for how long.[3,4] Dentists often administer medications during treatment and sometimes prescribe them afterwards. This underscores the importance of dental professionals being well versed in prescribing requirements.[5] Developed countries, such as Canada in 2020 added prescribing skills to its specific list of mandatory training objectives for medical schools.[6]

According to the World Health Organization (WHO) guidance on good prescribing, every country has its own prescription laws and there is no universal norm for a specific prescription format. However, the guidelines emphasize the clear inclusion of: the prescribing healthcare professional's details, the patient's complete identification, the medication's generic name, dosage, frequency, duration of treatment, recommended route of administration and prescribers' initials or signature.[1,7]

Research indicates a decline in the proficiency of prescription writing among medical and dental students upon entering their third year of clinical rotations. This decline was believed to be influenced by factors such as an increased workload, a more laid-back approach to learning, and reduced emphasis on assessment.[8]

This study aims to quantitatively evaluate the pre session, post session and short-term impacts of a refresher workshop intervention on the prescription writing skills of young dental practitioners. This will help to identify prevalent errors, enabling the

Correspondence: Dr Saira Bibi, Department of Dental, Islamabad Medical and Dental College, Islamabad Pakistan

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integration of targeted strategies into the training of dental graduates in the future.

METHODOLOGY

The Quasi-experimental study was conducted from October to November 2023 involving young dentists at Islamabad Dental Hospital following approval from the Institutional Review Board (Ref #IMDC/DS/IRB/237, dated August 8, 2023). Residents or house officers enrolled immediately after their graduation were considered as young dentists for our study. The sample size for the study was calculated using the WHO Sample Size Calculator, version 2.0. Based on an anticipated proportion of dentists who had exposure to new scientific knowledge for prescription writing 26%,[9] a confidence level of 95% with a margin of error (e) of 0.05 and power of test 80%, the required sample size was determined to be 63 house officers. Data collection was conducted over a one-month period using a convenience sampling technique, achieving a 100% response rate.

Inclusion Criteria: The study included recent dental graduates (within one year of graduation) who had not received any training on prescription writing in the past six months and had signed consent forms.

Exclusion Criteria: Dentists who had previously received training on prescription writing were excluded from the study.

Written consent was obtained from all participants (Ref #IMDC/DS/IRB/237, dated August 8, 2023). Their names and contact numbers were collected for a follow-up after one month. The tools employed for data collection comprised written prescriptions and a checklist scoring system. The checklist was meticulously designed to assess key elements, such as the date of the prescription, prescriber details (name, contact number, and address), patient details (name, age, gender, address, and registration number), diagnosis and corresponding symbol, header symbol, and drug-related information (correct name, dosage form, dose, duration, route of administration, frequency, and accurate instructions and advice).

For scoring purposes, each accurately provided component was assigned one point, while the absence or incorrect inclusion of a component resulted in a score of zero. The total achievable score for participants was established at 19. Participants were tasked with generating a prescription for a clinical case, both before and after undergoing a prescription-writing workshop. The study employed a within-subjects design, allowing for a comparison of participants' performance before and after the workshop. Initially, each participant was presented with a blank page and a specific clinical case scenario projected on a screen. Participants were then instructed to write a prescription for that case, establishing a baseline measurement of their prescription writing skills. Following the initial prescription collection, a workshop focusing on prescription writing components was conducted. The workshop utilized various instructional methods, including lectures, slideshows, whiteboard explanations, question and answer sessions, and a review of sample prescriptions. After the workshop, participants wrote another prescription for a different clinical case to evaluate immediate improvements in their skills.

Participants were evaluated again one month later, with no further intervention provided during that period. They were asked to write a prescription for a third clinical case scenario. The collected prescriptions from both pre- and post-workshop assessments were compared to evaluate the immediate effects of the intervention. Additionally, prescriptions obtained during the long-term assessment were compared to assess the sustained impact of the workshop over time. To ensure objectivity, each prescription was anonymized by a faculty member not involved in the study, who assigned random numbers to the prescriptions. Subsequently, the prescriptions were crosschecked for the presence or absence of specific components related to prescription writing. Each component was assigned a score, and the percentage of the presence of each component was calculated for every prescription (Figure-1).

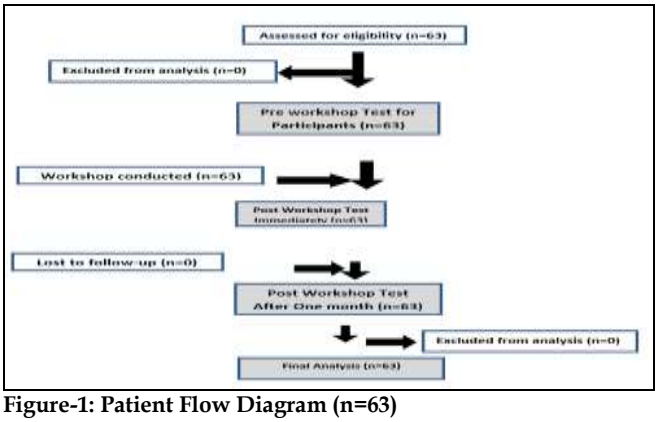


Figure-1: Patient Flow Diagram (n=63)

The prescriptions were then categorized into four groups based on the total score adopted from different similar studies, with Group A representing poor performance (Score 1 to 5), Group B indicating fair performance (Score 6 to 10), Group C reflecting good performance (Score 11 to 15), and Group D denoting excellent performance (Score 16 to 19). This scoring system allowed for a comprehensive evaluation and categorization of participants' prescription writing skills. Analysis was performed using IBM Statistical Package for Social Sciences Software (version 22). All categorical data was presented in the form of frequencies and percentages. Fisher's exact test was used to determine the difference in proportions at 5% level of significance (p<0.05).

RESULTS

Among these participants, the majority were female 46(73.01%), while males were 17(26.98%). Each participant contributed three prescriptions to the analysis, corresponding to three distinct time points before the workshop, immediately after the workshop, and one month after the workshop. All the collected forms underwent a comprehensive analysis, involving the assessment, scoring, and grading of 19 components deemed essential for inclusion in a well-crafted prescription. Figure-2 suggests a strong positive shift in prescription writing quality after the workshop, with a notable increase in "Excellent" grades and elimination of "Poor" grades. The slight drop in "Excellent"68.30% to 55.60% scores after one month may indicate some regression, which is common in retention studies.

All the collected forms underwent a comprehensive analysis, involving the assessment, scoring, and grading of 19 components deemed essential for inclusion in a well-crafted prescription. The findings of this analysis are visually represented in Figure-2.

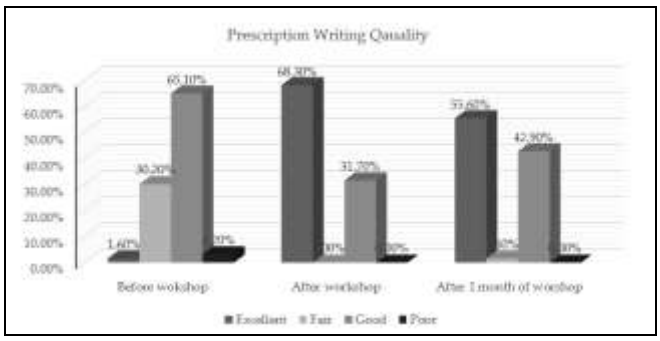


Figure-2: Assessment of Quality of Prescription Writing Before and After Workshop (n=63)

Table-I represents the percentages of different components mentioned in prescriptions of patients by the young dentists. Improvement in all components was observed after the workshop. More than 50% of the prescribers lacked patient details, including, name, age, gender and address. The drug-related errors included the drug's correct route of administration and drug's correct instructions which were not found initially, but after workshop 42.9% and 65.1% dentists start considering these components respectively. Significant improvement can be seen in the quality of prescription writing immediately after the conduction of workshop, as 43(68.3%) prescriptions were excellent, while remaining 20(31.7%) were good. Similarly, after one-month dentists were start writing prescriptions of good and excellent categories. But it can be observed that percentage of excellent prescriptions reduce from 43(68.3%) to 35(55.6%), making a significant change.

Table-I: Percentage of Written Prescription Components Before and After Workshop (n=63)

Prescription Components	Before Workshop n (%)	After Workshop (Immediately) n (%)	After 1 month of Workshop n (%)
Prescriber name Prescriber contact number	51(81.0%) 8(12.7%)	62(98.4%) 27(42.9%)	62(98.4) 38(60.3%)
Prescriber address (Hospital name)	11(17.5%)	42(66.7%)	42(66.7%)
Date of prescription	51(81.0%)	59(93.7%)	54(85.7%)
Patient name	43(68.3%)	62(98.4%)	62(98.4%)
Patient age	43(68.3%)	62(98.4%)	62(98.4%)
Patient gender	31(49.2%)	55(87.3%)	50(79.4%)
Patient address	29(46.0%)	49(77.8%)	52(82.5%)
Patient Registration Number	35(55.6%)	53(84.1%)	54(85.7%)
Rx	62(98.4%)	63(100.0%)	63 (100.0%)
Diagnosis and its symbol	35(55.6%)	60(95.2%)	52 (82.5%)
Drug's correct name	62(98.4%)	63(100.0%)	63 (100.0%)
Drug's dosage form	45(71.4%)	55(87.3%)	61 (96.8%)
Drug's correct dose	49(77.8%)	57(90.5%)	56 (88.9%)
Drug's duration	56(88.9%)	60(95.2%)	58 (92.1%)
Drug's correct route of administration	1(1.6%)	27(42.9%)	19 (30.2%)
Drug's frequency	63(98.4%)	61(96.8%)	63 (100%)
Drug's correct instructions	0(0%)	41(65.1%)	31 (49.2%)
Information and advices	58(92.1%)	51(81.0%)	56 (88.9%)

According to the study's established groups in Table II, an examination of prescriptions written prior to the workshop revealed that 65.1% dentists wrote a good prescription, 30.2% fair, 3.2% poor, while 1.6% wrote excellent prescription. Pairwise comparisons demonstrated significant differences in scores across all three assessments of prescriptions (p<0.001), as outlined in Table-II.

DISCUSSION

The study provides valuable insights into the competency of junior dentists (those within the first 2 years of practice after graduation from dental college)

across various essential components involved in prescription writing. Although many oral infections may be treated operatively or surgically, nevertheless, dentists widely prescribe antibiotics, as well as non-steroidal anti-inflammatory drugs for pain management.[10] Several Studies in Pakistan and other regions have identified concerns regarding prescription accuracy and completeness. These issues, such as incorrect medication details or missing patient information, can lead to adverse drug reactions, medication errors, and other health complications.[11]

Table-II: Association of Workshop Exposure with Changes in Prescription Writing Quality (n=63)

Grades	Before Workshop 63 (%)	After Workshop (Immediately) 63 (%)	After 1 month of Workshop 63 (%)	*p*-value
Excellent	1(1.6%)	43(68.3%)	35(55.6%)	<0.001
Good	41(65.1%)	20(31.7%)	27(42.9%)	
Fair	19(30.2%)	0(0.0%)	1(1.6%)	
Poor	2(3.2%)	0(0.0%)	0(0.0%)	

Inadequate prescription writing practices can lead to a cascade of negative consequences, like ineffective treatment, safety concerns, longer recovery times, and increased healthcare cost.[7,12,13] Several studies have endorsed that there is limited enhancement in prescribing abilities after graduation.[14] The confidence and competence in prescribing can be increased by using targeted education programs, vigorous refresher training courses leading to quality prescriptions.

Consequently, interventions such as training seminars, refresher workshops, and clinical discussions emerge as significant contributors to the augmentation of medical and dental graduates' prescription writing skills.[12] This suggests that targeted educational efforts can effectively enhance the proficiency of young dental professionals in the essential task of prescription writing, leading to improved outcomes both for the practitioners themselves and the patients under their care.[15]

The study reveals notable findings regarding the competency of dental practitioners in prescription writing, highlighting areas for improvement and emphasizing the positive impact of a refresher workshop. At one-month's assessment 100% of house officers correctly mentioned the medication name, however correct generic name should have been considered and more meaningful. Therefore, there is stillroom for improvement, particularly in the consideration of generic drug names. In comparison to the studies of Karachi and Lahore, where the generic name was a component, the percentage was considerably low (3.5% and 5%, respectively).[16,17] A similar Indian study considering just right drug name has 49% before and 85% after workshop percentages.[18]

In the current study, it was observed that even after the workshop (immediately) only 42.9% had mentioned the route of administration, declining to 30.2% after 1 month. Similar pattern was observed in other studies as well.[18,19] High percentage of practitioners missing this component might be attributed to their assumption that the patient already knows the route of administration (e.g., Tablets are assumed to be taken only orally). Regarding drug instructions, a notable improvement from 0% before the workshop to 65.1% immediately after was observed, which declined to 31% after one month. Hence, suggesting a need for more comprehensive interventions, potentially through enhanced educational strategies and increased clinical exposure.

The prescriber's address and phone number were absent from the majority of the prescriptions even immediately after workshop <70%, which is consistent with studies conducted in Karachi and Bahawalpur, Pakistan.[20,21] The WHO's recommendations that a prescription should include the doctor's full address so that he can be contacted in case of an emergency.[22]

In the current study, analysis of pre-workshop prescriptions revealed that patient's name (68.3%) and age (68.3%) was written by majority of the dentists. Patient's gender (49.2%), registration number (55.6%) and address (46%), and was missing in many prescriptions. Post session there was significant improvement in patient-related information, even maintained after one month of workshop. Patient's information is an important component of prescription writing, for ensuring that the right drug is given to the right patient, as well as for identification purposes.[23] Absence of these parameters in many prescriptions in our cohort may be due to fact that the dentist was used to writing prescriptions on hospital slips, with already printed patient's details on it.

Concerning the inclusion of the date of prescription, the study showed improvements from 81% before the workshop to 93.7% after and 85.7% after one month. However, these percentages were better than similar studies conducted.[16,17,19]

Although not including signatures as a component, the study highlighted the importance of house officers writing their names. This differed from

studies in Karachi and Lahore, where signatures were considered, resulting in higher signature rates but lower rates for writing prescriber names 15% and 4.2%, respectively.[16,17]

The study demonstrated an increase in proper diagnosis representation from 55.6% before the workshop to 95.2% after. The percentage was comparable to a study in Lahore but significantly better than a study in Iran.[17,19]

A substantial proportion (92.1%) of participants provided information and advice; however, this percentage declined to 81% immediately after post-workshop assessment and subsequently increased to 88.9% at one month. This discrepancy prompts a critical evaluation, considering that the first case involved an extraction of a molar tooth. In Dental Hospitals, the undergraduates often encounter a higher percentage of patients undergoing such extractions, and nearly all of them receive standardized post-operative written and oral information from dentists. However, the second and the third scenario focused on a pediatric extraction and a root canal treatment, which may be contentious due to the reduced exposure or sensitivity to such clinical situations during undergraduate training. Consequently, interventions are warranted to familiarize the young dental practitioners with post-operative instructions, particularly in scenarios beyond extraction, ensuring a comprehensive and balanced clinical education.

While the study recognizes the need for improvement in prescription writing skills, it acknowledges the positive aspects of the well-designed training program.

LIMITATIONS OF STUDY

Firstly, the potential effects of unmeasured latent variables, such as motivation, mental health and learning styles, cannot be ruled out. These factors could potentially bias the observed association between refresher workshop and improved performance. Secondly, the sample size restricts the generalizability of the findings to the broader population of junior dentists. Future research with a larger and more diverse sample is necessary to confirm these preliminary findings.

CONCLUSION

This study concludes that young dental practitioners demonstrate significant deficiencies in prescription writing. However, a refresher workshop positively impacted their skills. Prescription writing should be a core clinical learning objective. Dental education must adopt a more structured and integrated framework for teaching prescription writing. The study's results highlight the need for comprehensive training and serve as a reference for future research.

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Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

SB & HM: Data acquisition, critical review, approval of the final version to be published.

RH & ZBR: Conception, study design, drafting the manuscript, approval of the final version to be published.

FH & KS: Data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be 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.

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