

Analysis of Prescription Writing Skills of House Officers after Surgical Extraction of Wisdom Tooth in Compliance with W.H.O Guidelines

Arfa Baig^{1*}, Faiza Yousuf², Hiba Khalid Khan², Mehshaar Raheel Khan², Anwar Ali³,
Syeda Noureen Iqbal⁴, Imran Mehmood⁵

¹B.D.S., FCPS (Oral & Maxillofacial Surgery), Senior Registrar, Dept. of Oral and Maxillofacial Surgery, Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences, Dow University of Health Sciences Ojha Campus, Karachi, Pakistan.

²B.D.S., House Officer, Dept. of Oral and Maxillofacial Surgery, Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences, Dow University of Health Sciences, Ojha Campus, Karachi, Pakistan.

³B.D.S., FDS (Oral Surgery), Principal & Professor, Dept. of Oral and Maxillofacial Surgery, Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences, Dow University of Health Sciences, Ojha Campus, Karachi, Pakistan.

⁴B.D.S., FCPS (Oral & Maxillofacial Surgery), Assistant Professor, Dept. of Oral and Maxillofacial Surgery, Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences, Dow University of Health Sciences, Ojha Campus, Karachi, Pakistan.

⁵MBBS, MA, MMed, PhD, Director & Professor, Dow University of Medical Education, Dow University of Health Sciences, Ojha Campus, Karachi, Pakistan.

ABSTRACT

Background: Transalveolar extraction of wisdom tooth is related to increased post-operative swelling, infection and increased intensity of pain. Prescribing the right portions of appropriate medications after such clinical scenarios, is a significant part of dental practices that directly impacts the patient's well-being. The study was conducted to evaluate the abidance to the WHO Prescription Writing Guidelines by House Officers, and to assess the use of injectable analgesics and anti-inflammatory prescribed after surgical extraction of the wisdom tooth.

Materials & Methods: A three-page pro forma which included a written consent form, a questionnaire assessing the awareness of WHO prescription writing guideline, and a blank page with a clinical scenario about an impacted third molar was distributed among house officers of five institutes. The prescriptions written were assessed for the WHO core indicators and the frequency of IV painkillers and anti-inflammatories prescribed after the third molar surgery. Data analysis was done using SPSS 20.

Results: Majority of the scripts were lacking in WHO core indicators in the order; address of patient (0%), address and telephone number of prescriber (0%), total number of drugs (0.3%), instructions and warnings (0.7%), generic name of drug (3.5%), name of prescriber (4.2%), gender of patient (4.5%), age of patient (8%), name of patient (10.5%), date (12.2%), signature of prescriber (25.4%).

Conclusion: The results of the current study regrettably reported that compliance with the WHO Guidelines for prescription writing is inadequate. In addition to this, a lack of use of injectable analgesics and anti-inflammatory along with oral antibiotic cover after surgical extraction of the wisdom tooth was reported.

Keywords: Prescriptions, Impacted Third Molar Extraction, Injections/IV, Dexamethasone, Ketorolac Tromethamine.

*Correspondence to:

Dr. Arfa Baig,
B.D.S., FCPS (Oral and Maxillofacial Surgery),
Senior Registrar,
Department of Oral and Maxillofacial Surgery,
Dr. Ishrat-ul-Ebad Khan Institute of Oral Health Sciences,
Dow University of Health Sciences,
Ojha Campus, Karachi, Pakistan.

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INTRODUCTION

Prescription writing is a crucial aspect in the healthcare industry globally, as it affects patients and their well-being, in addition to the economic burden on society.¹ This is why it is considered to be a key skill for graduates to learn and implement as they become independent practitioners. Mistakes in prescription writing happen

most commonly, because of human errors. A portion of the regular mistakes seen during prescription writing can be credited to the wrong arrangement of drugs listed, absence of clarity, or spelling issues. This prompts bothersome outcomes, for example, exacerbating of treatment, a long and rehashed term of

prescription, and so forth. Consequently, the learning of recommending medications is of vital significance for a good dental practice.² Systemic reviews advocate the utilization of World Health Organization’s (WHO) guideline for prescribing medicines as the best quality level for educating medical students and doctors for appropriate prescription writing.³ As indicated by the WHO guideline, a prescription ought to incorporate the accompanying parameters: prescriber’s name, address, phone number, date, drug generic, drug form, potency, total number of drugs, direction of use, warnings, patient’s name, age, gender, residence, and prescriber’s sign or initials.^{4,5}

Surgical extraction of the wisdom tooth is related to pain, which is severe in intensity in the first post-operative twelve hours.⁶ Corticosteroids are effective at decreasing swelling and trismus, when given post-operatively.⁷ Compelling absence of pain might be accomplished by the use of powerful injectable analgesics, anti-inflammatories, and antimicrobials, as the bone is drilled and odds of contamination are extraordinary.⁸

Local literature is found scarce regarding awareness and implementation of WHO Prescription Writing Guidelines. The significance of conducting this study was to spread awareness, concerning the use of these guidelines within the House Officers in dental hospitals of Karachi. It aimed to avoid medication errors and increase patients’ safety to prepare them as independent practitioners. Additionally, to encourage the use of injectable analgesics and anti-inflammatory along with oral antibiotic cover after surgical extraction of the wisdom tooth to improve post-operative patient recovery.

OBJECTIVES

- To evaluate the abidance to WHO Prescription Writing Guidelines by House Officers.
- To assess the use of injectable analgesics and anti-inflammatory, prescribed after surgical extraction of the wisdom tooth.

MATERIALS & METHODS

A descriptive cross-sectional study was designed and carried out after the Institutional Review Board approval for a period of two

months in five different dental hospitals of Karachi, Pakistan. In accordance with the research done by Dilnasheen et al. in which 40 scripts showed errors out of a total of 200. The sample size is calculated using the formula from OpenEpi, Version 3:^{9,10}

$$n = \frac{[DEFF \times Np(1 - p)]}{\left[\frac{d^2}{Z_{1-\alpha}^2 \times (N - 1) + p \times (1 - p)} \right]}$$

Where, Population size (for finite population correction factor or FPC) (N): 1000000

Hypothesized % frequency of outcome factor in the population (p): 50%+/-5

Confidence limits as % of 100 (absolute +/- %) (d): 5%

Design effect (for cluster surveys-DEFF): 1

The calculated sample size needed is minimum 165 and maximum 271 for 90% confidence level. A three-page pro forma including a written consent form was distributed among house officers of five institutes irrespective of their department posting. A pre-validated questionnaire formulated by Jain et al. and later on tested in a study carried out in Punjab, Pakistan assessing the awareness of WHO prescription writing guideline was included in the pro forma.^{11,12} After answering the questionnaire, the participants were asked to write a detailed prescription for the given clinical scenario about an impacted third molar surgery. Both male and female house officers were included. After the collection was done, a handout was given to each house officer, showing the correct and ideal way of writing the prescription, based on WHO guidelines for their knowledge.

The scripts collected were initially assessed, using the WHO guideline for prescription writing. They were then rechecked thrice to lessen the error ratio. Later, they were evaluated for the presence of core indicators which included prescriber’s name, address, phone number, date, drug generic, drug form, potency, total number of drugs, direction of use, warnings, patient’s name, age, gender, residence, and prescriber’s sign or initials. They were also analyzed for the presence of IV painkillers and anti-inflammatories prescribed after the third molar surgery scenario. Data analysis was concluded and frequencies were run using the Statistical Package for the Social Sciences (SPSS) version 20.

Table 1: House Officer’s Source of Drug Information

Source of Drug Information	f	%
1. Teachers	191	67.0%
2. Books	130	45.6%
3. Pharmacology course	98	34.4%
4. Google(internet)	104	36.5%
5. Hospital charts	66	23.2%
6. No one	4	1.4%
7. Medical representatives	37	13.0%
8. Classmates	39	13.7%
9. Don’t know	0	0.0%
Total	285	100.0%

Table 2: Drug-related information among House Officers

House Officer’s Knowledge About	Aware		Unaware	
	f	%	f	%
1. Doses of Drugs commonly prescribed	278	97.2	8	2.8
2. Frequency of Drugs commonly prescribed	245	85.7	41	14.3
3. Duration of Drugs commonly prescribed	249	87.1	37	12.9
4. Different routes of drug delivery	266	93.0	20	7.0

Table 3: Presence of WHO Core Indicators of a Prescription

WHO Core Indicators of a Prescription		Absent		Present	
Descriptive		f	%	f	%
1.	Name of Patient	257	89.5	30	10.5
2.	Age of Patient	264	92.0	23	8.0
3.	Gender of Patient	274	95.5	13	4.5
4.	Address of Patient	287	100	-	-
5.	Date	252	87.2	35	12.2
6.	Symbol R/	156	54.4	131	45.6
7.	Generic name of drug	277	96.5	10	3.5
8.	Strength of drug	18	6.3	269	93.7
9.	Dosage form of drug	42	14.6	245	85.4
10.	S. – instructions and warnings	285	99.3	02	0.7
11.	Total amount of drugs	286	99.7	01	0.3
12.	Name of prescriber	275	95.8	12	4.2
13.	Address of prescriber	287	100	-	-
14.	Telephone number of prescriber	287	100	-	-
15.	Signature or initials of prescriber	214	74.6	73	25.4

Table 4: Injections Prescribed after Wisdom Tooth Extraction

Injections Prescribed	Prescribed		Not Prescribed	
Descriptive	f	%	f	%
1. IV or IM Dexamethasone Sodium Phosphate	39	13.6	248	86.4
2. IV or IM Ketorolac Tromethamine	33	11.5	254	88.5

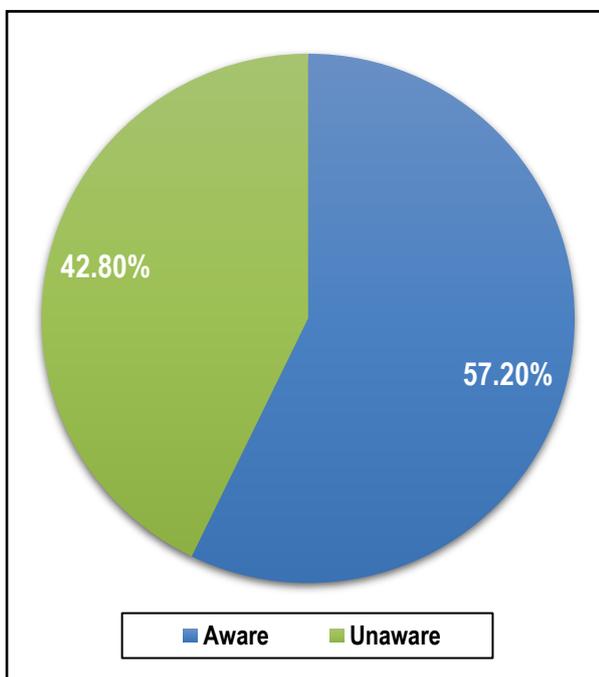


Fig 1: Awareness about WHO Guide to Good Drug Prescription

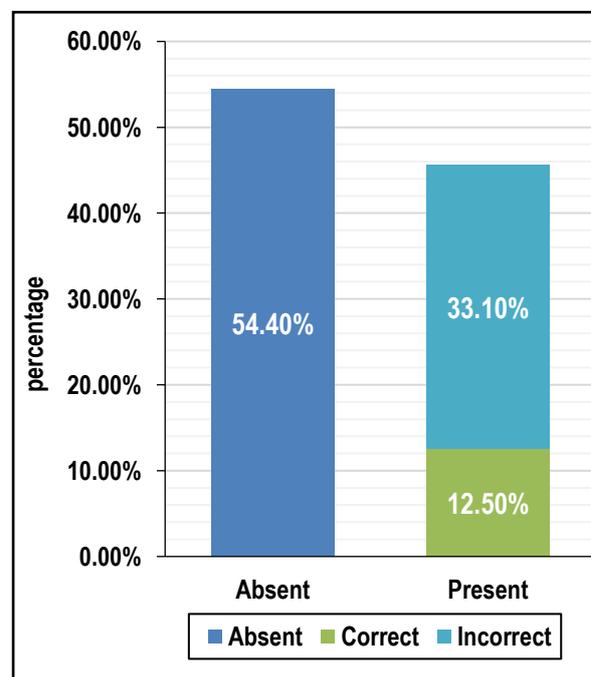


Fig 2: Presence of Symbol R/

RESULTS

A total of 300 proformas were distributed to the House Officers in different dental hospitals of Karachi. Out of which 287 were returned. The house officers were inquired about their knowledge of the WHO Guide to Good Prescription. Almost half of the House Officers (57.2%) reported awareness about this guideline. (Fig 1). The prescriptions were scored for the 15 core indicators of the WHO guideline. The majority of the scripts were lacking important patient demographics. Only 10.5% of the house officers mentioned the name of the patient, 8% mentioned the age, 4.5% mentioned the gender, and alarmingly no one mentioned the address of the patient. Date was missing in 87.2% of the scripts. (Table 3) Half of the scripts (54.4%) lacked the superscription R/.

Out of 45.6% house officers, 12.5% mentioned it correctly. (Fig 2) The majority of the scripts (96.5%) lacked generic names of the drugs. The most commonly mentioned core indicators included strength (93.7%) and dosage form (85.4%) of the drugs. Instructions and warnings were absent from 99.3% of the scripts. Important identifiers of the prescribers such as name (95.8%), address (100%), and telephone number (100%), and signature/initials (74.6%) were largely absent. (Table 3) According to the clinical scenario given of a surgical extraction of an impacted wisdom tooth, only 13.6% of the house officers prescribed IV or IM Dexamethasone Sodium Phosphate. Prescriptions for IV or IM Ketorolac Tromethamine were only 11.5% out of the total. (Table 4)

DISCUSSION

Prescribing is the demonstration of specifying at least one medication, which is either given to or consumed by the patient, its measurement, and regimen. In dentistry, prescription writing is an essential clinical ability; professionally demands all dental specialists be well equipped with this expertise since they have to advise dental medicines in their practices. Prescribing right portions of appropriate medications is a significant part of dental practices, that directly impacts the patient's well-being.¹³ This study analyzes the capability and awareness of house officers in relation to the prescription writing guidelines of WHO.

According to the responses to the questionnaire, the most sought-after source for drug information among house officers were their Teachers (67%) comparatively more than in the cross-sectional survey done by Jain et al. (34.67%).¹² During the one year of house job after graduation, house officers are still learning and get the supervision by teachers is good for their development as an independent dentist. An improvement is seen in our results as the house officer depend less on their classmates (13.7%) for advice compared to 20.67% or more in previous studies by Jain et al. and Guzmán-Álvarez et al.^{12,13} (Table 1)

House Officers who claimed to be aware of the WHO Guide to Good Prescription, were 57.2% of the total and the remaining 42.8% reported a lack of knowledge about it. (Figure 1) The survey done by Jain et al. found 55.3% of the third and final year students unaware of this guideline which is more than our findings.¹² However, the difference in awareness was not translated into the scripts when evaluated as majority of them lacked the WHO core indicators.

An increase in knowledge about drug doses (97.2%), frequency (85.7%), duration (87.1%), and different routes of drug delivery (93%) was noted among the house officers in comparison to the survey done in India among dental students of the third and final year by Jain et al.² This could be attributed to the amount of clinical exposure of house officers compared to final year and third year students, providing more learning opportunities regarding drug posology.

According to the WHO guidelines, a prescription must be named for the respective patient, including other identifiers such as, age and gender; also essentially dated in order to avoid medication errors and drug abuse. The age of the patient is crucial for the calculation of drug dosage. Considering how much importance these components of a prescription hold, the pattern identified in the current research was alarming. At about 89.5% of the scripts were missing the name of the patient, 92% were missing the age, 95.5% were missing the gender and all of them were missing the address of the patient. Predominantly, 87.2% of the scripts were found to be not dated. (Table 3) In practice, the use of preprinted prescription writing pads can tackle these omissions by reminding doctors to fill all the mentioned blanks.¹⁴

In Punjab, significantly better results were published by Babar et al. reporting 87% of the scripts with patient name, 55% of the scripts with age of the patient, and 42% of the scripts with the gender of the patient.¹⁵ On the contrary to the results of the present research, 100% of the scripts from Andrapradesh, India carried the name of the patient. However, only 15% of the scripts had the age of the patient.¹⁶ Regarding the address of the patient, a general trend of absence is noticed among many researches.^{15,16} Address of the patient may feel redundant, but it is

necessary in order to track back the patient for follow-up or in case of prescribing or dispensing errors.

As per the WHO guidelines, the correct superscription is R/ instead of Rx as commonly mistaken. In the present study, 54.4% of scripts lacked the superscription. Out of the 45.6% scripts that contained this superscription, only 12.5% were found to be in line with the WHO guideline. (Figure 2) However, a study from Jaipur, India claimed 100% scripts having this ,but did not factor in the correct presence as the current research.¹⁷

The WHO recommends that 100% of the drugs need to be prescribed generically.⁵ But an opposite trend was seen in the present and the South Asian studies. Only 3.5% of the drugs were prescribed using generic names in this study. A slight increase was noted in the study done in Jaipur, India with 8.33% of the scripts with generic names.¹⁷ Contrary to this pattern, 98.7% of generic prescribing was noted in Ethiopia by Desalegn. Improvement in patient compliance and less burden financially is reported as a significant benefit of prescribing medicines generically.^{18,19}

The most prevalent core indicators in the scripts analyzed were the strength (93.7%) and dosage form (85.4%) of the drugs. This is in sync with the awareness reported about drug-related information as mentioned in Table 3. However, a difference between the knowledge of students and house officers is evident, as previous studies document 50% and more students making the most common error due to incorrect drug posology.^{2,12,13}

WHO guidelines include instructions and warnings related to the drug to be mentioned as **S.** as a part of the script in addition to verbal instructions. This is deemed necessary because medical personnel shouldn't rely on the patient's memory or patient's word. Alarming, 99.3% of the scripts analyzed in the current study, lacked this component. Likewise, a study done in Brazil by Mendonca et al. detected the absence of this key component in 96% of the scripts.²⁰ The consequences of skipping this core indicator include a change in the interval of doses, decrease efficacy and therapeutic effects of the drug, which would increase the burden on the public health services providing free access to medication.²¹

Among the least detected WHO core indicators, the total amount of drugs to be dispensed was absent in 99.7% of the scripts. Only one house officer mentioned it correctly encircled after the drug name and dosage. This demonstrates the lack of communication between doctors and pharmacists. Moreover, it shows complete absence of rules and regulations needed to be implemented to reduce drug misuse in our society. Penalties and strict vigilance is need to be introduced by the health ministry, to make sure that these rules are followed in order to address this communication gap. However, better results were found in a research done in Lahore, by Babar et al. where 45% of the scripts included this core indicator.¹⁵ This shows better compliance with WHO guidelines in Punjab than in Sindh, bringing to notice a huge gap in the education of dental graduates.

In order to trace back or confirm errors in prescriptions, correspondence details of the prescriber are a key factor. However, any sort of identifiers of the prescriber such as name (95.8%), address (100%), and telephone number (100%), and signature/initials (74.6%) were reportedly missing from the scripts. Contrary results were reported in Punjab by Babar et al. where 82% of the scripts contained the name of the prescriber.¹⁵ A

similar trend among these researches was noted regarding the address of the prescriber, depicting better compliance in Lahore than in Karachi. Owing to their better education system and policy implementation, scripts of Punjab generally showed comparatively better overall compliance.

Trans-alveolar extractions of wisdom tooth require the bone to be drilled in order to clear the pathway for tooth delivery, which leads to increased chances of post-operative swelling, infection and increased intensity of pain. This knowledge is a part of the undergraduate dental course. Despite, that the current study observed only 13.6% of the scripts carrying IV or IM Dexamethasone Sodium Phosphate and even lesser (11.5%) having IV or IM Ketorolac Tromethamine. (Table 4)

Post-operative to an impacted wisdom tooth surgery, a pain killer is not enough. Additional methods are needed to be employed to improve post-op patient care. These include anti-inflammatory drugs, steroidal injection or a long-acting local anesthetic.²² In a survey of the American Association of Oral and Maxillofacial Surgeons by Ibrahim et al. 80% of OMF surgeons reported injecting steroids after the removal of an impacted third molar.²³ NSAIDs are the popular choice for the management of dental pain however the selection of analgesics should factor the severity of intraoperative trauma to the bone and tissues.²⁴ Walton et al. conducted a double-blind clinical study, in which, Ketorolac 30mg IV showed more efficacy with the type of pain related to the surgical extraction of an impacted wisdom tooth.²⁵ In a research conducted by Dione et al. the combination of dexamethasone in combination with ketorolac demonstrated increased efficacy in the treatment of postoperative pain in comparison to dexamethasone alone.²⁶

House officers, in their supervised clinical training and being recent graduate, were expected to be capable of writing a prescription correctly. An immense gap of knowledge and implementation is depicted by the high number of errors and inadequacies in the scripts analyzed. An urgent requirement of continuing educational courses, targeting clinical pharmacology and refresher training courses for case-related prescription knowledge is felt to bridge the gap of knowledge and implementation reported in house officers. The need for incorporating a section, targeted at making graduates capable of writing prescriptions, accurate in a well-structured problem-based clinical pharmacology syllabus, is deemed a need of the hour.²⁷ Using the WHO Guidelines for this purpose is a smart choice, as it offers an organized standardized guide in order to develop a strong basis for prescription writing skills.⁵

The exclusion of WHO core indicators as detected in the majority of the scripts, may be linked to the absence of a preprinted writing pad. Having said that, in order to truly assess the prescription writing skill and knowledge of the house officers, the providence of a blank paper in the pro forma was compulsory. Comparative analysis between house officers and final year undergrad students was a limitation, considering the impermissibility of final year students to undertake surgical extractions. Generally, including the current research, only the presence of indicators is assessed. Researches, including analysis of accuracy in these indicators, need to be conducted in order to evaluate the knowledge, in addition, the skill.

The absence of audits or lack of implementation of regulations to detect prescription errors, also adds to the declining situation.

Scarcely literature is present locally, which correlates the errors and omissions in a prescription to the adverse reactions. Similarly, studies aimed at long term changes in the prescribing patterns in order to evaluate the educational curriculum on prescriptions are needed to be done locally.

CONCLUSION

Concluding the results of the current study, it is unfortunate to report that compliance with the WHO Guidelines for prescription writing is inadequate. This inadequacy in prescription writing skills is alarmingly more in the practices of Pakistan, compared to numerous other countries. In addition to this, a lack of use of injectable analgesics and anti-inflammatory along with oral antibiotic cover after surgical extraction of the wisdom tooth was reported, despite scientific evidence supporting improved post-operative patient recovery.

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