



## "Prescription writing- The mistakes we make": A Prospective Study

Srinivasan K<sup>1\*</sup>, Chitra S<sup>2</sup>

1. Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Adhiparasakthi Dental College and Hospital, Melmuruvathur (T.N state).
2. Associate Professor, Department of Anaesthesia, Christian Medical College, Vellore (T.N state).

\*Corresponding author: Dr. K. Srinivasan; 1/24, Kamaraj street, VOC Nagar, Sankaranpalayam, Vellore (T.N state), Email: skskspedo@gmail.com

### Publication History

Received: 24 December 2015

Accepted: 29 January 2016

Published: 1 March 2016

### Citation

Srinivasan K, Chitra S. "Prescription writing- The mistakes we make": A Prospective Study. *Medical Science*, 2016, 20(78), 56-62

### Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

### General Note



Article is recommended to print in recycled paper.

## ABSTRACT

**Aims and Objective:** This study aimed to describe the quality of prescriptions by Private Practitioners for legibility and accuracy.

**Materials and Methods:** Three hundred prescriptions of Private Practitioners were taken for assessment of legibility and accuracy. The prescriptions were assessed by two investigators and a third adjudicated in case of disagreement. For assessment of handwriting, a scoring method was used. Other parameters which were assessed were: spelling of medicine names, formulation, drugs strength and dosage form, use of nonspecific abbreviations, use of archaic terminologies such as OD, HS etc. and use of capital letters.

The samples were collected over a period of 7 days. The samples were then analyzed for their content based on an ideal prescription format and the results were tabulated.

The collected data were entered and analyzed using Statistical software package (SPSS version 14) and the results were presented as percentage. Results were analyzed and presented using tables, and pie charts.

**Results:** Three hundred prescriptions of Private Practitioners were taken for assessment of legibility and accuracy and Clarity of dose.

Results were expressed in percentages. Spellings of Medicine names in all prescriptions were incorrect (79%).

In formulations and drugs strength not mentioned in the prescriptions (81%) of cases

Abbreviations of names of drugs were written by 40.6% of prescribers.

72% of prescribers preferred to use archaic terminology and only 69% of the prescribers had written the prescriptions in capital letters. Nearly 39.6% of the prescribers did not put the leading zero where applicable.

Legibility Clarity of instructions and Clarity of dose of prescriptions was clear but requires effort to read which constituted about 93%, 80.3 and 90% respectively (scored 1 or 2).

The findings of the study suggest that most of the prescriptions given are woefully inadequate in content.

**Conclusions:** A major percentages (72%) of Private Practitioners using the archaic terminologies which usually cause confusion to the dispensers and consumers. Use of capital letter while preparing a prescription, avoiding use of abbreviations and archaic terminologies as well as using the technology such as printing the prescription may ensure a quality service to the consumer.

It can be concluded that a clear policy about the standard of prescriptions and periodic internal monitoring is the answer for quality prescriptions. To have better prescriptions and better health care facilities a computerized format would be the answer.

**Key Words:** Ideal prescriptions, Legibility, Practitioners, Prescription.

**Abbreviations:** SPSS -Statistical software package, GP-General Practitioner.

## 1. INTRODUCTION

Drugs are an integral part of the health care system and have a vital role in maintaining human health and saving mankind. Lacunae in the availability of drug use information worldwide suggest that drug use is suboptimal (Angamo MT et al., 2011).

Prescription order is an important transaction between the Physician and Patient. It is order for scientific medication for a person at a particular time (Gaud RS et al., 1989).

It brings into focus the diagnostic acumen and therapeutic proficiency of the Physician with instruction for palliation or restoration of patient health (Benet LZ et al., 1991).

After the introduction of Consumer Protection Act-1986(CPA-1986) in India, prescription has become a valuable, consumable linkage between the Patient and the prescriber. A prescriber, in India, is usually a registered Medical Practitioner. The ethical and legal duty of a Medical Practitioner is to write the prescription clearly and legibly. Legibility and accuracy are the essential features of every prescription (Ian L.O. et al., 2006; Lofholm PW et al., 2009).

The introduction of 'Right to Information Act 2005' (RTI Act-2005) also extends message to the people about the transparency of any social intervention. Therefore, it is the inherent right of every patient to have a correct, unambiguous and clear prescription. A large number of Medical errors include medication errors which may be related to writing of an illegible prescription and dispensing of wrong, inappropriate medications which results in adverse events and death also (Ian L.O. et al., 2006).

According to the World Health Organization (WHO), 'the rational use of drugs demands that the appropriate drug be prescribed; that it be available at the right time at a price people can afford, that it be dispensed correctly; and that it be taken in the right dose at the right intervals and for the right length of time. The appropriate drug must be effective, and of acceptable quality and safety (WHO, 1985). The concept of rational drug use is age old, as evident by the statement made by the Alexandrian physician Herophilus 300B.C. that is medicines are nothing but very hands of GOD if employed with reason and prudence (Gurbani N.K et al., 2000).

Rational use of drug depends on many activities such as making the correct diagnosis and prescribing the appropriate drugs in correct doses (Embaye A et al., 2002).

Prescription writing is a science as well as an art, which conveys a message from the prescriber to the Patient (Kumari R et al., 2008; Begum F et al., 2012). Under-prescribing of drugs leads to sub therapeutic effects, secondary infections and delayed treatment, while over-prescribing is associated with adverse effects, unwanted drug interactions and patient noncompliance. Thus, to avoid the consequences of under- or over-use of drugs, a proper balance should be attained.

There is paucity of data in India in the field of prescription surveys, particularly covering the aspects of legibility and accuracy. But the experts' conclude that ambiguity or confusion in prescription order may be avoided by following some principles while preparing a prescription. These are usually: hand writing-must be clear, spelling of medicine name-must be correct, formulation and strength of medicines-should be quoted clearly, abbreviation of medicine name should be avoided, using archaic terminologies such as Q.D., O.D., should be avoided, leading zero should always be used, capital letter-should be used (Teichman PG et al., 2002; Ian L.O. et al., 2006; Lofholm PW et al., 2009).

The prescription patterns were assessed using the WHO drug use indicators, and the quality of prescriptions was evaluated in terms of their layout, clarity and legibility and the clarity of the doses and instructions in them.

In the present study we made assessment of the prescriptions patterns and quality of prescriptions written by Medical Practitioners in Vellore Tamilnadu, India.

## 2. MATERIALS AND METHODS

A cross-sectional survey of all prescriptions received by the Patients over a period of 7 consecutive days in Dec 2015 (01/12/15–07/12/15) was conducted.

The study was carried out by collecting prescriptions from 20 GP's (General Practitioner) practicing in Vellore and only 10 cases from each GP were observed per day for a period of one week.

For the study, 300 prescriptions were photocopied from a bunch of nearly 1400 prescriptions

The collected data were collected by an assessment of legibility and accuracy of prescriptions through prescription surveys following the simple random method.

The prescriptions were randomly selected by spreading the prescription on the floor and three male children of ten years old was asked to pick up 100 prescriptions each one by one with his eyes closed by handkerchief. The children selected were free from any Medical treatment under any Physician consultation.

A written consent from every patient the doctor was obtained before collecting prescriptions, and all the communications were free from conflicts of interest.

The prescriptions were collected from the patients who came to us for counseling about their disease, treatment, drug use, operation and legal problems. Study confidentiality was maintained during and after data collection in order to avoid any bias.

A prescription data record form was prepared. To maintain identity in record each prescription was given a code number starting from 01 to 300.

The layout of the prescriptions was assessed on the basis of the presence or absence of the understated details. Twelve parameters were assessed in each prescription. They were as follows

The prescriptions were assessed by two investigators and a third adjudicated in case of disagreement. The parameters we chose for assessing in every prescription were:

1. Vital statistics
  - Patient information (five parameters)-Name, Age, Sex, Address, Date of treatment.
  - Doctor's information (four parameters)-Name of Doctor, qualification Signature, Contact Number.
2. Documentation of the drugs in the case paper: Yes/No.
3. Instructions given to the patient: Verbal/Written.
4. Hand writing- assessed by a four point scoring method :( Bad=0, Good=1, Better=2, Best=3.
5. Spelling of Medicines: Correct / Incorrect.
6. Formulations and strength of drugs: Mentioned/ Not mentioned.
7. Abbreviations of drug names: Used/ Not used.
8. Archaic terminology (Q.D., O.D., H.S., etc): Used/ Not used.
9. Leading zero: Used/Not used.
10. Capital letter: Used/ Not used.

Legibility of prescriptions was assessed on the basis of the following points:

Whether the prescription was legible clarity of prescription (4-point rating system):

- Score 1: Prescription details are clear and legible.
- Score 2: Clear but requires effort to read.
- Score 3: One aspect not clear (Patient name/drug name).
- Score 4: More than one aspect not clear.

### *Inclusion criteria*

1. Patients willing to participate and give informed written consent were included.
2. Patients, both males and females visiting the clinics of Private Practitioners.

### *Exclusion criteria*

1. Incomplete prescriptions.
2. Prescriptions with illegible handwriting.
3. Prescriptions without diagnosis.
4. The prescriptions of Government and private hospitals were not included for the study.

### 3. RESULTS

Three hundred prescriptions of Private Practitioners were taken for assessment of legibility and accuracy and Clarity of dose (Table 1, Graph.1, 2). Results were expressed in percentages. Spellings of Medicine names in all prescriptions were incorrect (79%).

In formulations and drugs strength mentioned in the prescriptions (81%) of cases

Abbreviations of names of drugs were written by 40.6% of prescribers.

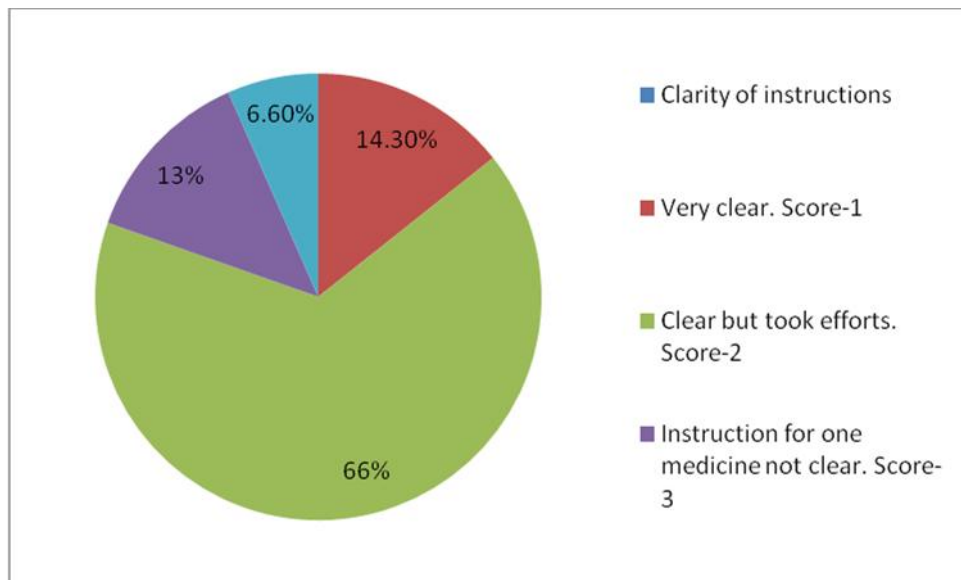
72% of prescribers preferred to use archaic terminology and only 31% of the prescribers written the prescriptions in capital letters.

Nearly 60% of the prescribers had put the leading zero where applicable.

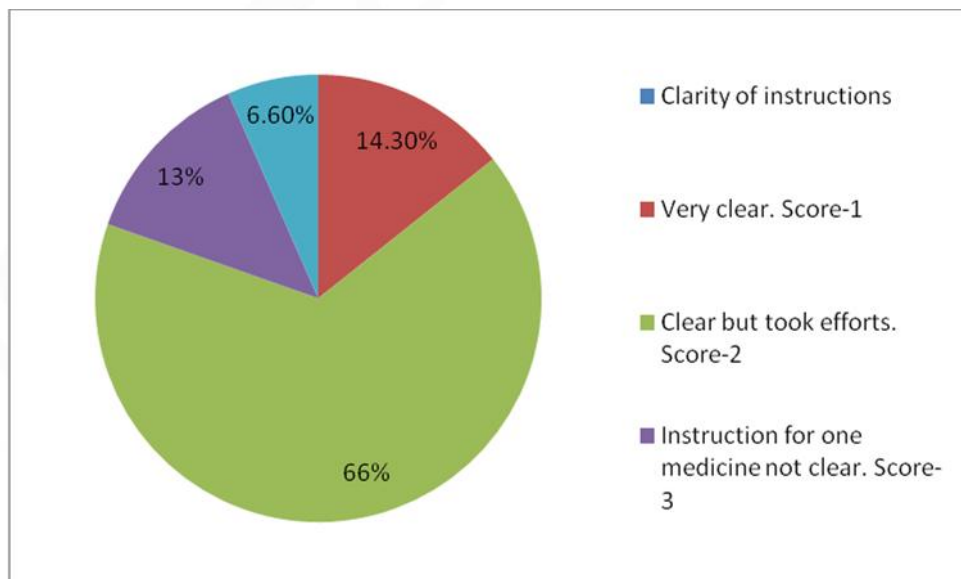
Legibility Clarity of instructions and Clarity of dose of prescriptions was clear but requires effort to read which constituted about 93%, 80.3 and 90% respectively (scored 2 or 3).

**Table 1** Legibility and clarity of prescriptions (n=300)

S. No	Criterion		Frequency (N)	Percentage %
1	Documentation of the drugs in the case paper	Yes	78	26%
		No	222	74%
2	Instructions given to the patient	Verbal	207	69%
		Written	93	31%
3	Spelling of medicines	Correct	63	21%
		Incorrect	237	79%
4	Formulations and strength of drugs	Mentioned	243	81%
		Not mentioned	57	19%
5	Abbreviations of drug names	Used	122	40.6%
		Not used	178	59.3%
6	Hand writing- assessed by a four point scoring method	Bad=0	198	66%
		Good	73	25%
		Better	8	2.6%
		Best.	21	7%
7	Archaic terminology ( Q.D., O.D.,H.S., etc )	Used	216	72
		Not used	84	46%
8	Leading zero	Used	252	60.3%
		Not used	48	39.6%
9	Capital letter	Used	93	31%
		Not used	207	69%
10	<b>Legibility</b>			
	Prescription details are clear and legible.	Score-1	18	6 %
	Clear but requires effort to read.	Score-2	261	87 %
	One aspect not clear (patient name/drug name).	Score-3	15	5 %
	More than one aspect not clear.	Score-4	6	2 %
11	<b>Clarity of instructions</b>			
	Very clear.	Score-1	43	14.3 %
	Clear but took efforts.	Score-2	198	66 %
	Instruction for one medicine not clear.	Score-3	39	13 %
	Instruction for more than one medicine not clear.	Score-4	20	6.6 %
12	<b>Clarity of dose</b>			
	Clear and legible, Drug details present (strength & daily dose).	Score-1	21	7 %
	Clear but requires effort to read.	Score-2	249	83 %
	Criteria not met for one drug.	Score-3	18	3 %
	Criteria not met for more than one drug.	Score-4	21	7 %



**Graph 1** Legibility of prescription



**Graph 2** Clarity of dose

## 4. DISCUSSION

General Practitioners have occupied a central position in the provision of primary health care for many years. General practice is cost effective, low-tech, and flexible. During the consultation trust and understanding between the doctors and patient are developed, which facilitate effective care to be offered.

Illegible prescriptions result in a lower quality of healthcare by loss of time and money, medication errors and patient harm, inefficient or faulty communications and create legal issues. Factors which might affect the aspect and quality of prescribing and errors which may occur while prescribing have been revealed. Remedial measures to avoid the prescription errors and to improve the legibility of prescriptions have also been evaluated by researchers. (Bruner A et al., 2001).

Legibility of doctors' handwriting was assessed in some studies. In one study, it was found that doctors' handwriting was no less legible than other professionals (Berwick DM et al., 1996); in another study, it was revealed that doctors' handwriting when was compared to other healthcare professional and administrators was the worst of all (Lyons R et al., 1998).

In this study, we assessed the prescriptions of Private Practitioners who practice in nursing home or clinic setup. It was concluded that 66% of the handwritten medication orders or case-notes were bad.

In this study, we observed that 87% (n=300) of prescriptions were illegible or legible with effort and scored 2 or 3.

In two different studies where case-notes (n=117) and out-patient progress notes (n=50) were studied, respectively 15% and 16% of the prescriptions were found to be illegible (Berwick DM et al., 1996; Lyons R et al., 1998).

In one study 176 indoor-Patients medication orders were evaluated, 20% of them were illegible or legible with effort (White KB et al., 1996; Winslow EH et al., 1997).

Another study revealed that 15% of prescriptions of out-door patients were illegible (Meyer TA et al., 2000). So far we were unable to relocate any study which would comment about spelling of Medicine names.

In this study, spellings of Medicine names were correct in all prescriptions. In order to get information about the dosage form, formulations-we evaluated about the use of formulations, drugs strength and use of non-specific abbreviations. In 19% cases the formulations and drugs strength were not mentioned in the prescriptions, but abbreviations were used in 40.6% of prescriptions. In one study it was found that 11.4% of prescribers used wrong drug name, dosage form or abbreviations (Lesar TS et al., 1997).

Two important factors which usually affect the accuracy of prescriptions and causes confusion and misinterpretation of prescriptions are: use of archaic terminologies such as OD, BD, HS etc. and omission of leading zero where applicable (Winslow EH et al., 1997).

In this study, we found that 72% of the prescribers used archaic terminologies, 39.6% of prescribers did not put the leading zero and 31% of prescriptions were written in capital letter.

## 5. CONCLUSION

Prescribers are free to prescribe the drugs of their choice either they comply with the national policies or not this causes a burden on health system. Standard prescription layout is not being followed even by a single prescriber. There is no check point for the prescriptions standard. Directions for the Pharmacist or dispensers are not present even in a single prescription this ignorance may leads to adverse drug reactions.

The study reveals that the private practitioners are not maintaining the standard and are not ensuring adequate quality of prescribing. Generation of a error-free prescription requires adequate care and attention about the multiple components which affects the legibility and accuracy of prescriptions.

## LIMITATIONS

There were some limitations to our study.

- Firstly this study was carried out only in private sector the valuable data could also be gathered from public sector, is missing, to make comparison between public and private sector.
- Secondly this was done only in the GP's clinics, private hospitals were not included.

Our sample size was also small and not according to the criteria set by the WHO this was because of shortage of time.

## RECOMMENDATIONS

More research studies should be conducted to assess the prescribing practices of general practitioners in private sector and there should be a check on their prescriptions. Training programmes should be conducted to train the prescribers and to educate them about the importance of neglected parts of prescriptions. Intervention surveys should also be conducted. Education programmes for public awareness should be conducted to create awareness about the overuse of drugs. Patients should know what they are taking for their illness and what alternatives they have.

## ACKNOWLEDGMENT

All the authors express sincere gratitude to all respondents whose honest attention help and support and the participants of the study lead the Research project to worthwhile outcome.

## CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no special financial support for this research work from the funding agency and there is no conflict of interest among all authors.

## REFERENCES

1. Angamo MT, Wabe NT, Raju NJ. Assessment of patterns of drug use by using world health organization's prescribing, patient care and health facility indicators in selected health facilities in south west Ethiopia. *Journal of Applied Pharmaceutical Science*, 2011, 1, 62-66
2. Begum F, Uddin MR, Islam MMSU, Sarker MN, Barman RC, AliMY. Evaluation of prescribing pattern of the private practitioner's in Bangladesh. *Faridpur Med Coll J*, 2012, 7, 51-53
3. Benet LZ, Principles of prescription order writing and patient compliance instructions. In: Goodman AG, Rall TW, Nies AS, Tylor P, (Eds). Goodman and Gillman's pharmacological basis of therapeutics, 8th ed, New York: Pergamon Press Inc, 1991,16-20
4. Berwick DM, Winikoff DE. The truth about doctors' handwriting: a prospective study. *BMJ*, 1996, 313, 1657-1658
5. Bruner A, Kasdan ML. Handwriting errors: harmful, wasteful and preventable. *J Ky Med Assoc*, 2001, 99, 189-192
6. Embaye A. Drug use studies in Eritrean Health Facilities. March 1 2002. Available from: [Http://ddc.bumc.edu/richardl/IH820/Embaye\\_Concentration\\_paper.htm](http://ddc.bumc.edu/richardl/IH820/Embaye_Concentration_paper.htm)
7. Gaud RS, Jain DK, Kaskhedikar SG, Chaturvedi SC, Critical evaluation of present prescribing pattern. *Indian J hosp Pharm*,1989,26,70-72
8. Gurbani N.K; Sharma Ramesh war and Dandiya P.C; *PharmaTimes*. Rational use of drugs, 2000,18-33
9. Ian L.O. Buxton. Principles of Prescription order writing and patient compliance. In Goodman and Gilman's *The Pharmacological Basis of Therapeutics*. 2006. 11th edition. Macgraw Hill, 1777-1786
10. Kumari R, Idris MZ, Bhushan V, Khanna A, Agrawal M, Singh SK. Assessment of prescription pattern at the public health facilities of Lucknow district. *Indian J Pharmacol*, 2008, 40, 243-47
11. Lesar TS, Briceland L, Stein DS. Factors related to errors in medication prescribing, *JAMA*, 1997,277, 312-317
12. Lofholm PW, Katzung BG. Rational prescribing and prescription writing. In *Basic and Clinical Pharmacology*. Tata Macgraw Hill. 11th edition, 2009,1127-1136
13. Lyons R, Payne C, McCabe M, et al. Legibility of doctors' handwriting: Quantitative comparative study. *BMJ* 1998, 317, 843-844
14. Meyer TA. Improving the quality of the order-writing process for inpatient orders and outpatient prescriptions. *Am J Syst Pharm*, 2000, 57 Suppl,4, 18-22
15. Teichman PG., Caffè A.E. Prescription Writing to Maximize Patient Safety. *Fam. Pract. Manag*, 2002 9 27-30
16. White KB, Beary JF. Letter to the editor: Illegible handwritten records. *N Engl J Med*,1996, 314,390-391
17. WHO Drug action Committee: Model Guide to Good Prescribing,1995, 52
18. Winslow EH, Nestor VA, Davidoff SK, Thompson PG, Borum JC. Legibility and completeness of physicians' handwritten medication orders. *Heart Lung*, 1997, 26(2), 158-164
19. World Health Organization .The Rational Use of Drugs. Report of the Conference of Experts. Geneva: WHO, 1985