Assessment of Prescription Pattern of Toothache and tooth extraction Patient's Prescription: A Prescription Survey Study from Various Hospitals and Clinics of Bhubaneswar and Cuttack

*Arin Bhattacharya[1], Anurag Satpathy[2], Prashant Tiwari[3]

1. J.K. College of Pharmacy, Bilaspur, (C.G.), India.

2. Institute of Dental Science, SOA University, Bhubaneswar, Orissa, India.

3. School of Pharmacy, CEC, Bilaspur, (C.G.), India.

Email: arinpharma@rediffmail.com

Summary

In the dental science, there was a growing concern regarding the irrational prescription pattern and use of drugs more than required. To examine the patterns of toothache and tooth extraction prescriptions was collected through prescription survey of various hospitals and clinics in Bhubaneswar and Cuttack. 793 prescriptions were collected from 5 hospitals and 31 clinics of Bhubaneswar and Cuttack. The study confirms that quality of prescriptions, both in terms of layout and the content of the drugs prescribed, was inadequate in case of toothache and toothextaction. Also the study reflects the immediate urgency to develop a mechanism for dentists to ensure the subjects gets proper evidence based dentistry.

Keywords: - Prescription pattern, toothextaction, evidence based dentistry.

Introduction

Dental diseases were one of the commonest ailments known to mankind. Almost everyone suffers some kind of dental disease at some point or the other. Toothaches usually refer to pain around the teeth or jaws as primarily as a result of dental condition. In most instances, toothaches were caused by tooth problems such as a dental cavity, a cracked tooth, an exposed tooth or gum disease. However disorders of the jaw joint (Temporo-mandibular joint) can also cause pain that was also referred as toothache. The severity of a toothache can range from chronic and mild to sharp and excruciating. The pain may be aggravated by chewing or by cold or heat. Sometimes, a toothache can be caused by problems not originating from a tooth or the jaw. [1][2] Pain around the teeth and the jaws can be symptoms of diseases of the heart (such as angina or heart attack, ears (such as inner or external ear infections), and sinuses (air passages of the cheekbones). [2] For example, the pain of angina (inadequate supply of oxygenated blood to the heart muscle because of narrowing of the arteries to the heart) was usually located in the chest or the arm. However, in some patients with angina, a toothache or jaw pain was the only symptom of their heart problem. Infections and diseases of the ears and sinuses can also cause pain around the teeth and jaws. [2] Common dental causes of toothaches include dental cavities, dental abscess, gum disease, irritation of the tooth root, cracked tooth syndrome, Temporo-mandibular joint (TMJ) disorders, impaction, and eruption [3-13] A dental extraction (also referred to as exodontias) was the removal of a tooth from the mouth.

Extractions were performed for a wide variety of reasons, including tooth decay that has destroyed enough tooth structure to prevent restoration. Extractions of impacted or problematic wwasdom teeth were routinely performed, as were extractions of some permanent teeth to make space for orthodontic treatment. The most common reason for extraction was tooth damage due to breakage or decay. There were additional reasons for tooth extraction: [14]

- Severe tooth decay or infection. Despite the reduction in worldwide prevalence of dental caries, still it was the most common reason for extraction of (non-third molar) teeth with up to two thirds of extractions.[15]
- Extra teeth which were blocking other teeth from coming in.
- Severe gum disease which may affect the supporting tissues and bone structures of teeth.
- In preparation for orthodontic treatment (braces)
- Teeth in the fracture line
- Fractured teeth

Although many dentists remove asymptomatic impacted third molars, American as well as British Health Authorities recommended against this routine procedure, unless there were evidences for disease in the impacted tooth or the near environment. The American Public Health Association, for example, adopted a policy, *Opposition to Prophylactic Removal of Third Molars (Wisdom Teeth)* because of the large number of injuries resulting from unnecessary extractions. [16] Receiving radiation to the head and neck may require extraction of teeth in the field of radiation. A prescription (℞) was a health-care program implemented by a physician or other medical practitioner in the form of instructions that govern the plan of care for an individual patient. [17]. Prescription order was medication for a person at a particular time [18]. It brings into focus the diagnostic acumen and therapeutic proficiency of the physician with instructions for palliation or restoration of the patient's health. [18] Prescriptions may include orders to be performed by a patient, caretaker, nurse, pharmacist or other therapist. Commonly, the term *prescription* was used to mean an order to take certain medications. Prescriptions have legal implications, as they may indicate that the prescriber takes responsibility for the clinical care of the patient and in particular for monitoring efficacy and safety. Prescription writing was a science and an art, as it conveys the message from the prescriber to the patient. [19], [20]
A prescription should consist of the following seven parts:

1) Date, Identification of the prescriber

2) Name of the patient and information as to age.

3) Superscription or heading.

4) Inscription or main body of the prescription.

5) Subscription or directions to the compounder.

6) Signature or directions for the patient.

7) Prescriber's signature, seal of the prescriber.

A prescription was frequently divided into the superscription, including all above the list of ingredients; the inscription, including the ingredients and their amounts; the subscription, including all below this, as directions to compounder, directions for patient, and prescriber's name.

Materials and Methods

The subjects were enrolled in the study according to the inclusion and exclusion criteria. Enrollment of the Subjects takes place on the sites selected for the study. The subjects were educated about the study by the investigator, the subject were informed what was the objective of the study, what was importance of such type of study, why they were asked to participate in the study, how to participate in the study, what were the information subject had to give to the investigator, the subjects confidentiality clause, what were the benefits they were going to be get from thwas study and after explaining all the parameters mentioned above the informed consent was asked from the subjects and subjects giving the informed consent were enrolled in the study. During enrollment of subjects any types of pressure on the subjects to participate in the study were no given. The subject has given the freedom to give or to not give the consent for the study. Each of the steps mentioned above like enrollment of subjects, informed consent procedure, and subjects confidentially study was in accordance with standard guidelines used in clinical study like GCP, Schedule Y of Drugs and Cosmetics Act, Principle of Helenski. [21], [22], [23]. Subjects were selected on the basis of the inclusion and exclusion criteria. The inclusion and exclusion criteria of the study were as follows:-

INCLUSION CRITERIA

- ✓ Subjects coming to the Dental OPD
- ✓ Subjects giving the consent for the Study
- ✓ Subjects ready to share the information in the prescription.
- ✓ Adult subjects having age equal to or over 18 was included in the Study

EXCLUSION CRITERIA

- ✓ Subjects not giving the consent for the Study
- ✓ Subjects having age less than 18 Years

Following parameters were studied in each prescription:-[31]

1) Presence of date

2) Identification of the patient and the prescriber

3) Presence of the methods of administration for the medication

4) Presence of pharmaceutical form

5) Presence of dosage

6) Frequency

7) Authorized stamp

8) Signature of the prescriber

9) Duration of treatment

The frequency of number of cases was calculated.

Following parameters were also studied when prescription were audited

- Gender study- It was carried out by auditing the prescription to find the frequency of male and female subjects.

Legibility criteria: - Legibility of each prescription was checked and the prescription were divided into 3 classes namely: - [24], [25], [26], [27], [28] , [29]

a) Legible: - Can read easily.

b) Legible with effort: - Can read with some difficulty.

c) Illegible: - Prescription which can't be read at all.

- Erasures: - Erasures in each prescription were also noted and frequency was calculated.
- Brand or Generic: - The drugs prescribed were also observed whether they prescribed by generic name or brand name. [30]

The methodology used for this study can be explained by following flowchart

FIGURE 1

Results

In the prescription study for toothache Method of administration was the most common parameter absent in the prescription (79.31%) followed by Authorized Stamp(56.73 %) followed by Duration of treatment(49.65 %), Presence of pharmaceutical Form(19.83%) , Presence of Dosage(18.86 %) in Hospitals and Clinics of Bhubaneswar and Cuttack .(FIGURE2). In case of the prescription study for tooth extraction Method of administration was the most common parameter absent in the prescription (72.72%) followed by Authorized Stamp(53.37%) followed by Duration of treatment(47.13%), Presence of pharmaceutical dosage Form(14.52%) , Presence of Dose(8.36%) in Hospitals and Clinics of Bhubaneswar and Cuttack .(FIGURE3) Method of administration was the most common parameter absent in the prescription (77.60%) followed by Authorized Stamp(55.83%) followed by Duration of treatment(48.03%), Presence of pharmaceutical Form(17.07%) , Presence of Dosage(16.31%) in Hospitals and Clinics of Bhubaneswar and Cuttack .(FIGURE4)

FIGURE 2: Prescription pattern study for Toothaches in Bhubaneswar and Cuttack (in %)

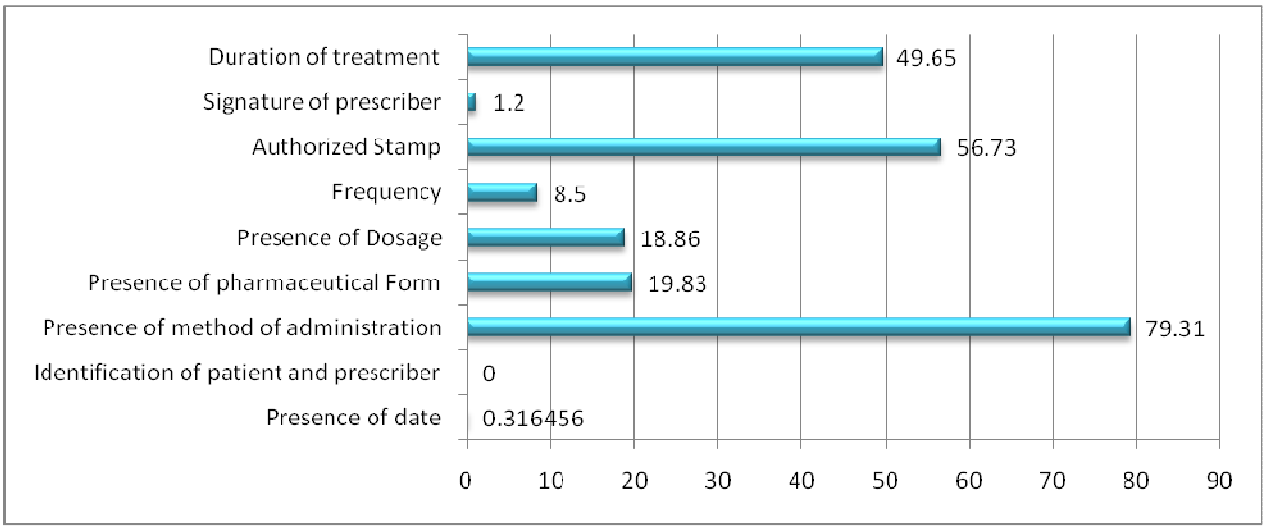


FIGURE 3: Prescription pattern study for Tooth extraction in Bhubaneswar and Cuttack (in %)

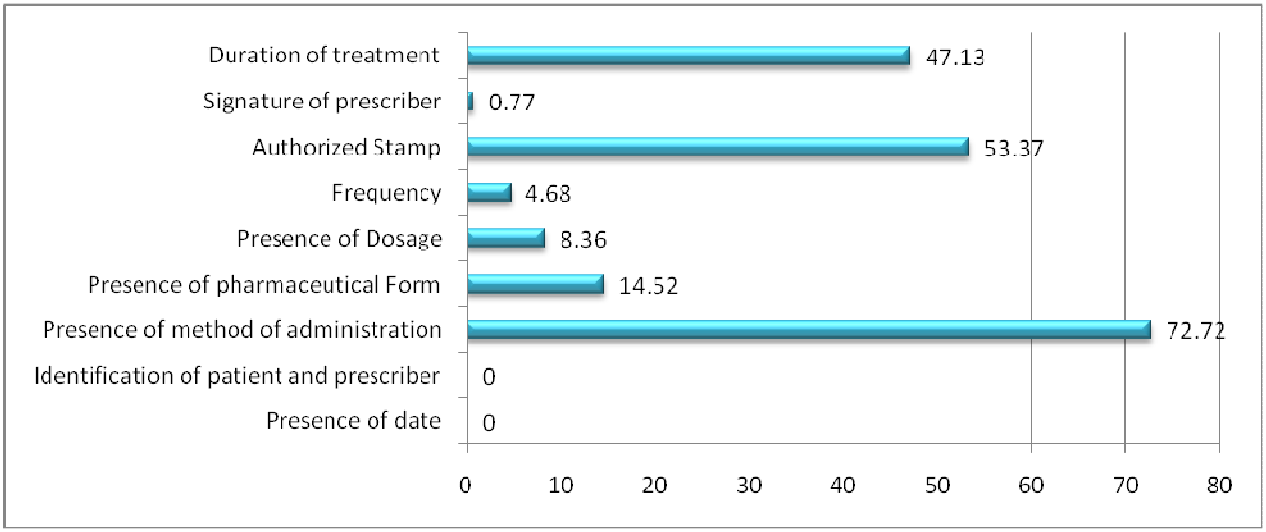
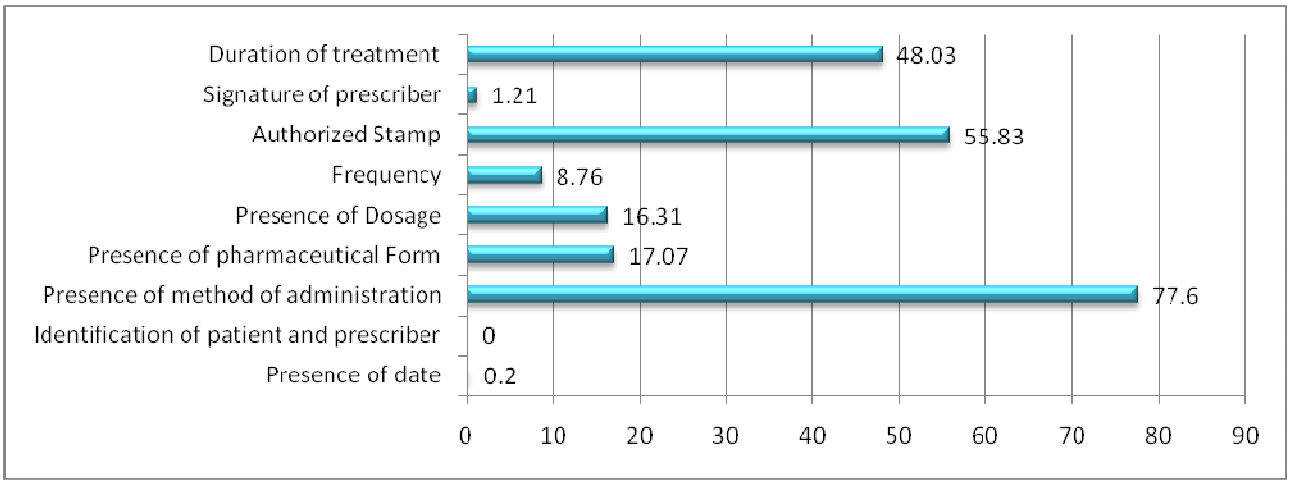


FIGURE 4: Prescription pattern study for Toothache and Tooth extraction in Bhubaneswar and Cuttack(in %)



Gender study for Bhubaneswar and Cuttack for toothache shows that the no of males subjects (67.50 %) and female subjects (32.50 %) respectively (Table 1). Gender study for Bhubaneswar and Cuttack for tooth extraction shows that the no of males subjects (41.64%)) and female subjects (41.64%)) respectively (Table 2), the average no males in toothaches and tooth extraction was (56.04%) whereas the average no males in toothaches and tooth extraction was (Table 3)

TABLE 1: Gender study for Toothache in Bhubaneswar and Cuttack

SR.NO	GENDER	HOSPITAL (BHUBANESWAR)	CLINICS (BHUBANESWAR)	HOSPITAL (CUTTACK)	CLINIC (CUTTACK)	AVERAGE FREQUENCY
1	Male	57.92 %	58.62%	66.10%	87.34%	67.50%
2	Female	42.08%	41.38%	33.90%	12.66%	32.50%

TABLE 2: Gender study for Tooth extraction in Bhubaneswar and Cuttack

SR.NO	GENDER	HOSPITAL (BHUBANESWAR)	CLINICS (BHUBANESWAR)	HOSPITAL (CUTTACK)	CLINIC (CUTTACK)	AVERAGE FREQUENCY
1	Male	65.71%	53.33%	16.41%	31.11%	41.64%
2	Female	34.29%	46.67%	42.19%	68.89%	48.01%

TABLE 3: Average Gender study in toothaches and tooth extraction in Bhubaneswar and Cuttack

SR.NO	GENDER	HOSPITAL (BHUBANESWAR)	CLINICS (BHUBANESWAR)	HOSPITAL (CUTTACK)	CLINIC (CUTTACK)	AVERAGE FREQUENCY
1	Male	59.93 %	57.07 %	40.24 %	66.94 %	56.04 %
2	Female	40.07%	42.93%	38.21%	33.06%	38.57%

In the legibility study the clarity of the prescription was assessed. Legibility was scored on a 3-point Likert scale:
1. Legible can read the medication order without consulting other health care professional or references.
2. Legible with effort can read the medication order after consulting with one or more health professionals and/or references.
3. Illegible, cannot read the medication order, despite consultation with one or more health care professionals and/or references.

In legibility study for Toothaches in Bhubaneswar and Cuttack it was found that most of the prescriptions (58.81%) were legible followed by legible with effort (35.09 %). Illegible prescriptions (5.97 %) were very few.[FIGURE 5]. In case of tooth extraction the 47.26% prescription were legible, 36.52 % prescription were legible with effort and only 9.02% prescription were illegible. .[FIGURE 6]. So we can say that most of the Prescriptions were legible (53.58%) followed by legible with effort (35.14 %). Illegible prescriptions (5.81%) were very few [FIGURE 7]. A model of prescription used in the study was given below. [FIGURE 8]

FIGURE 5 Legibility study for toothache Bhubaneswar and Cuttack (in %)

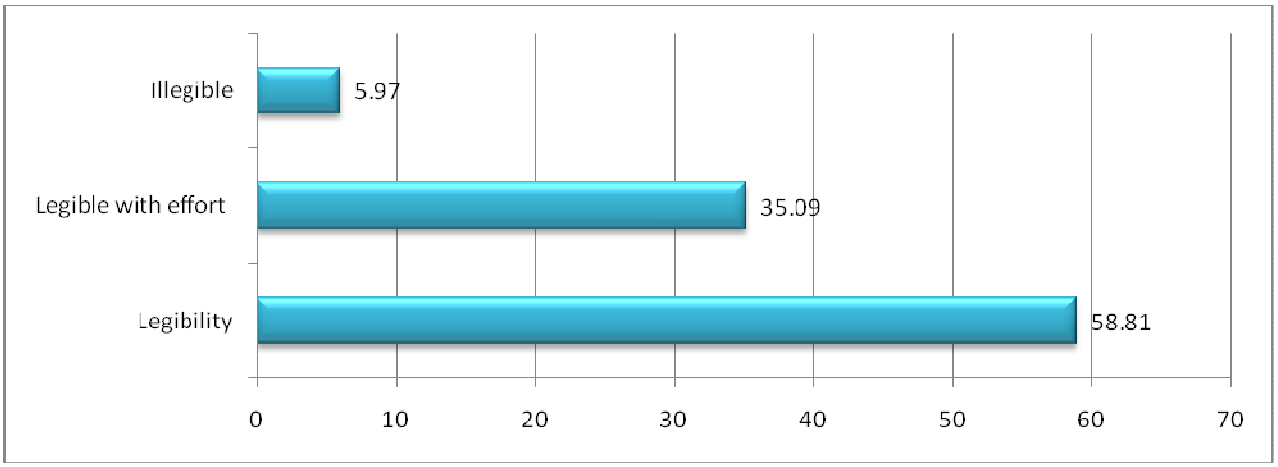


FIGURE 6 Legibility study for tooth extraction Bhubaneswar and Cuttack (in %)

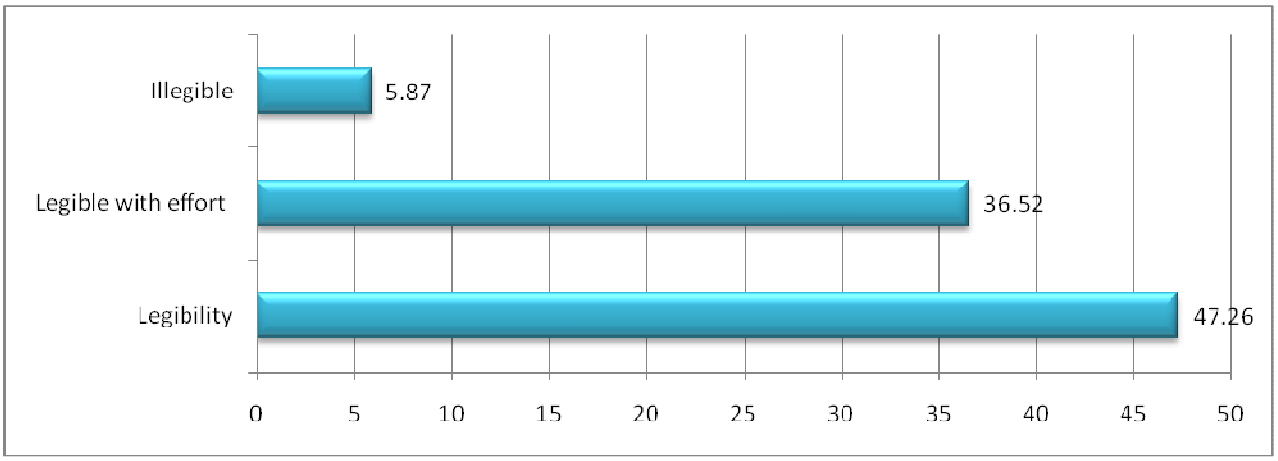


FIGURE 7 Combined Legibility study for toothaches and tooth extraction Bhubaneswar and Cuttack(in %)

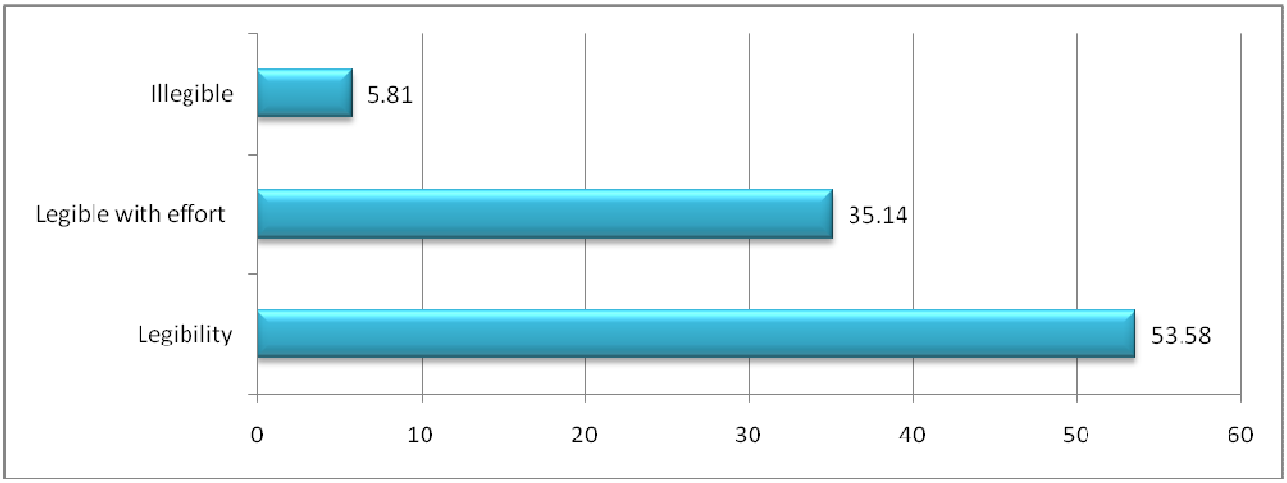
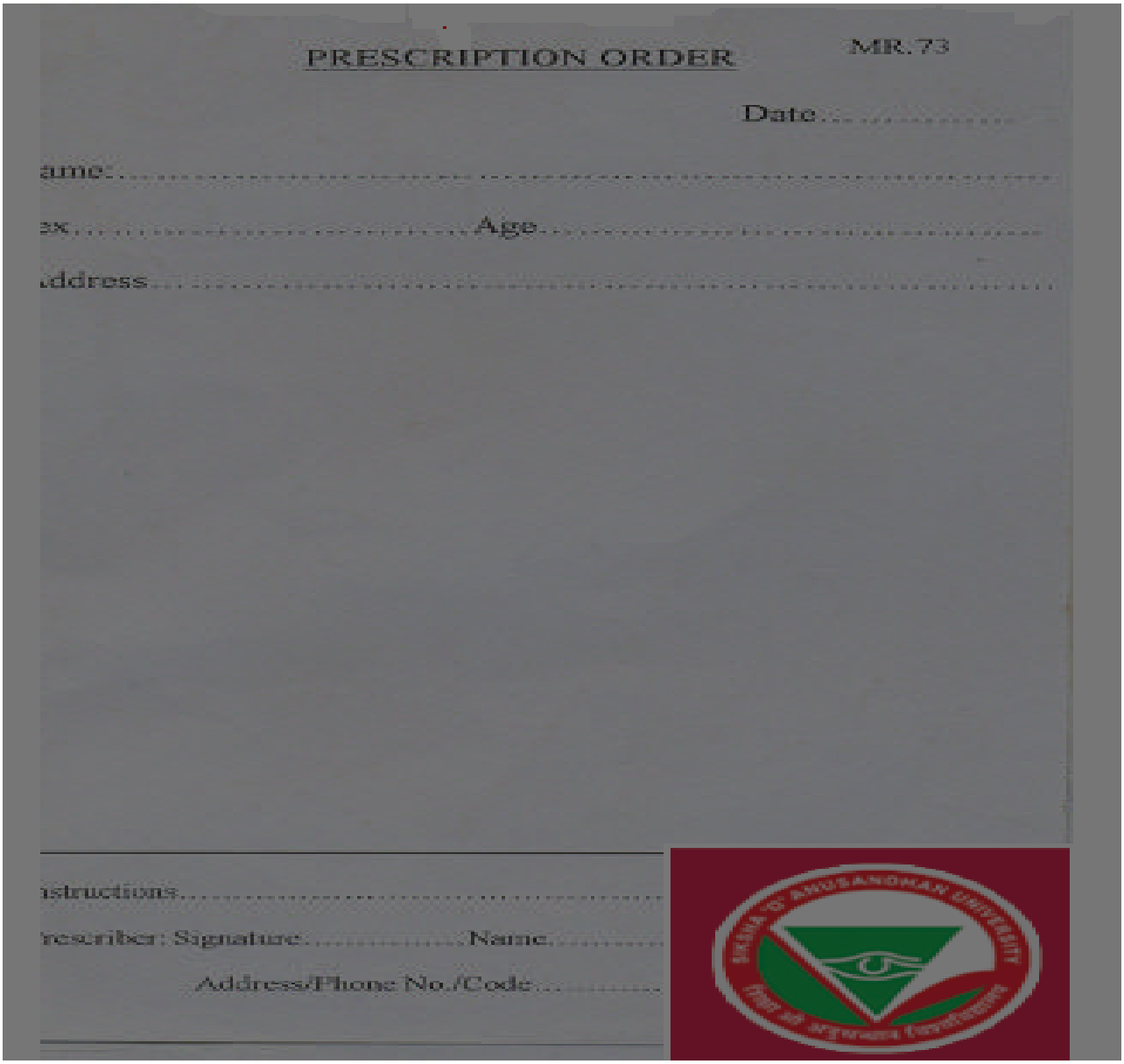


FIGURE 8 Model of Prescription used in the Study



In the erasures study the events of over writing was studied. In Bhubaneswar and Cuttack for toothache 90.98 % prescriptions have non erasures were as 9.02 % have erasures. [FIGURE9]. In case of tooth extraction 91.48 %prescriptions have non erasures were as 8.52 % have erasures. [FIGURE 11]. The total cases of non erasure in Toothaches and tooth extraction in Bhubaneswar and Cuttack was found to be 91.54 % whereas erasures were found to be 8.46 %. [FIGURE12].

FIGURE 9 Erasures study for toothaches Bhubaneswar and Cuttack.(In %)

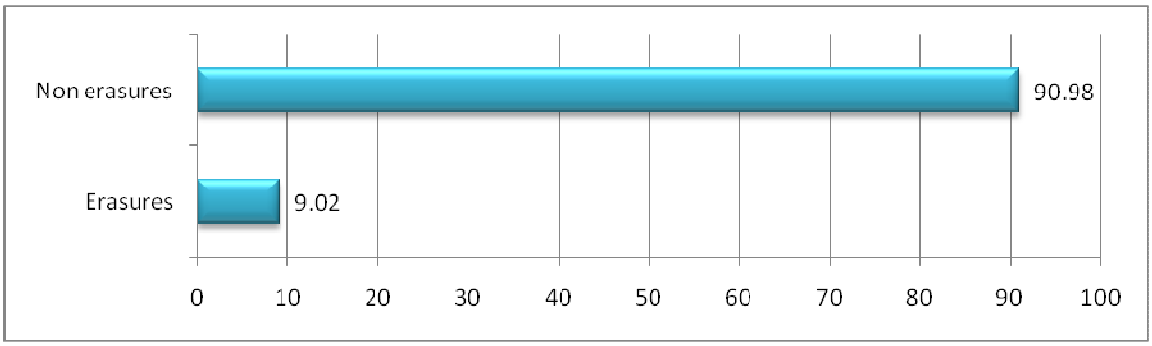


FIGURE 10 Erasures study for tooth extraction Bhubaneswar and Cuttack.(In %)

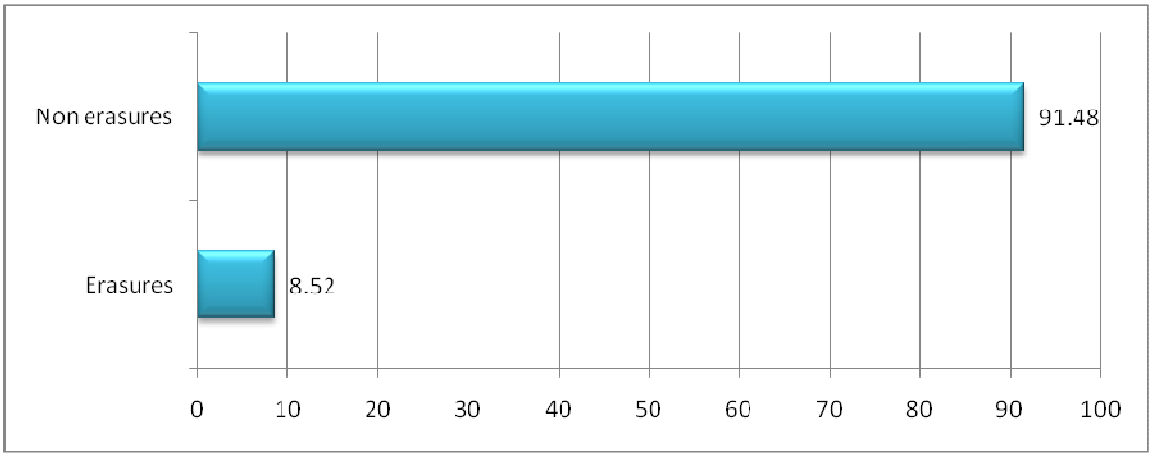
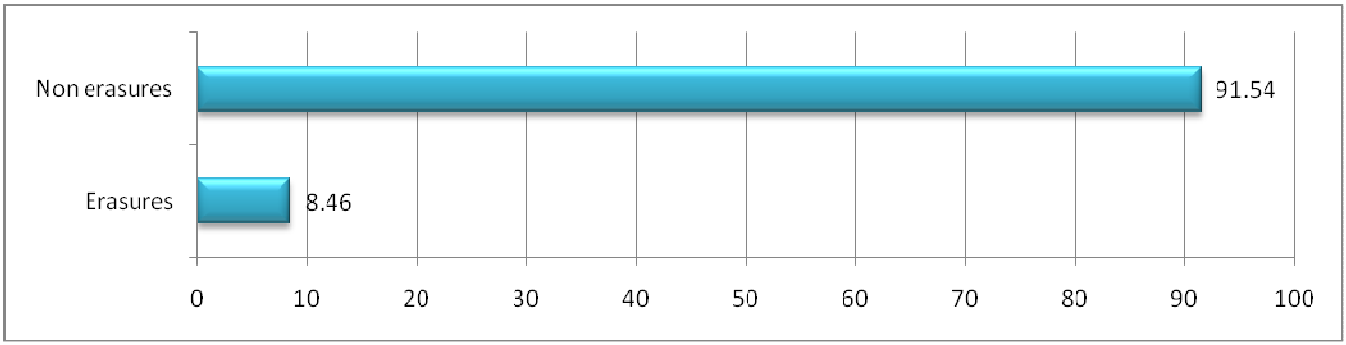


FIGURE 11 Average Erasures study for toothache and tooth extraction Bhubaneswar and Cuttack.(In %)



In case of toothaches in Bhubaneswar and Cuttack drug prescribed by brand name (96.29%) was more than the drugs prescribed by Generic names (3.71 %). [FIGURE 12] In cases of Tooth extraction in Bhubaneswar and Cuttack drugs prescribed by brand name (95.74%) was more than the drugs prescribed by Generic names (4.26%).[FIGURE 13]. Averages number of cases for both toothaches and toothextaction in Bhubaneswar and Cuttack drugs prescribed by brand name (95.97%) was more than the drugs prescribed by Generic names (4.03%).[FIGURE 14].

FIGURE 12 Generic or Brand name study for toothaches.(In %)

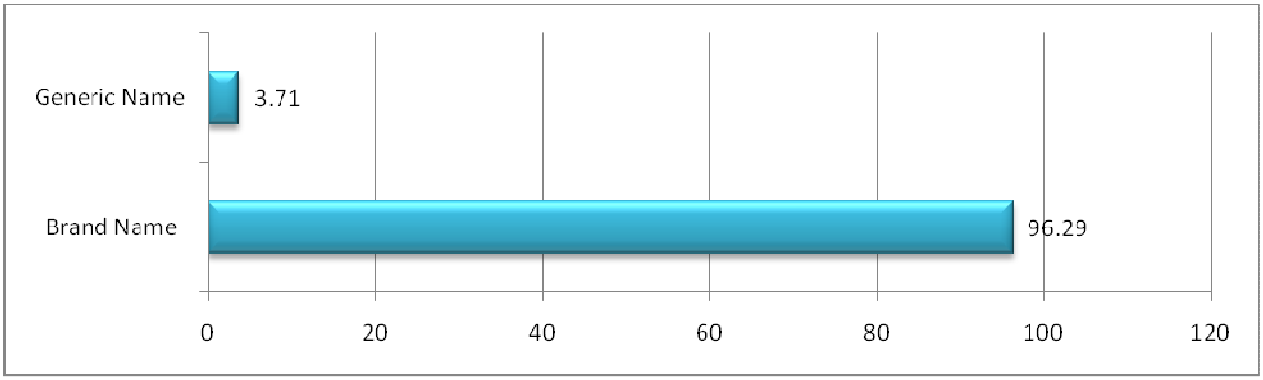


FIGURE 13 Generic or Brand name study for tooth extraction. (In %)

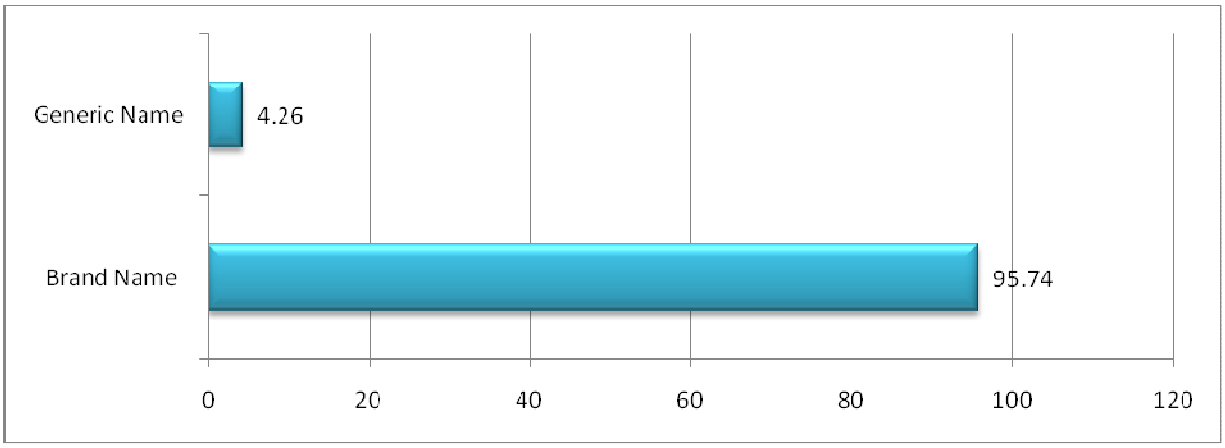
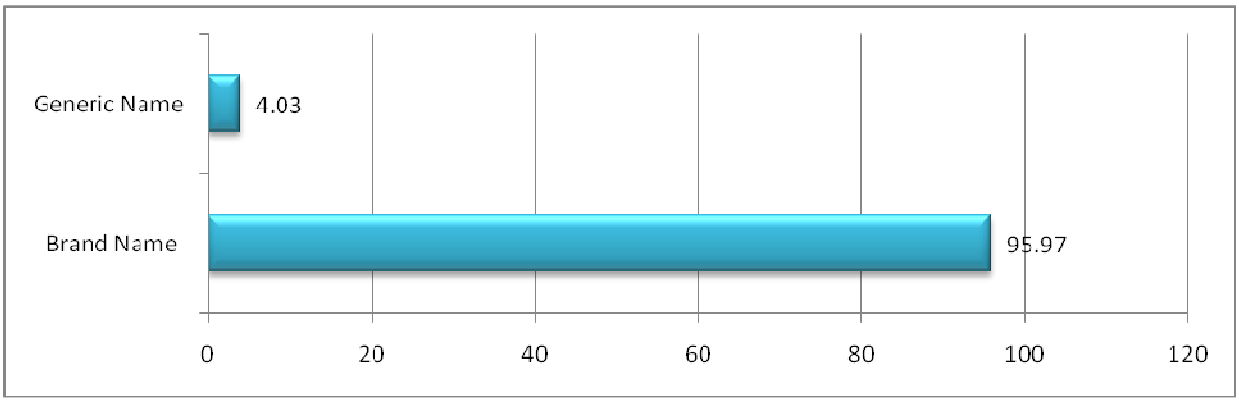


FIGURE 14 Combined Generic or Brand name study for toothaches and tooth extraction Bhubaneswar and Cuttack(in %)



Discussion

In the prescription audit it is found that methods of administration is absent in almost 80% of prescription. There were absence of other parameters like authorized stamp, duration of treatment, pharmaceutical dosage form and dose. The absence of parameters like methods of administration may caused by serious fatal interaction like bone deformities caused due to administration of milk with tetracycline, Cheese reaction caused MOA inhibitors, so this type of mistakes in the Prescription may cause drug interactions which can be lethal for the subjects concern. Absence of the dose can cause in either sub therapeutic or adverse effect and instead of providing the desired effect it provide either no effect or harmful effect. Prescription audit should be part and parcel of day to day prescribing system so that a system having more efficacy and low adverse effect can be gained. Our study has covered more male subjects than females. The legibility of the prescription also found to be poor. However the no of erasures is very less(less than 9%). Most of the drugs were prescribed by Brand names only 3-4% drugs were prescribed by generic name. A generic drug (generic drugs, short: generics) is a drug defined as "a drug product that is comparable to brand/reference listed drug product in dosage form, strength, route of administration, quality and performance characteristics, and intended use.". As per WHO recent guidelines drug should be prescribed by generic names for providing better services to the patients because generics are usually sold for significantly lower prices than their branded equivalent, So this is a major concern which need attention Prescription of more generic drugs can reduce the cost which will ultimately benefit the patients. Awareness should be developed among the Physicians to prescribe the drugs by generic names.

References

1. Epidemiology of Dental Disease, hosted on the University of Illinois at Chicago website.
2. Suddick RP, Harris NO "Historical perspectives of oral biology: a series". Crit. Rev. Oral Biol. Med. 1990 1 (2): 135–51.
3. Hardie JM. "The microbiology of dental caries". Dent Update 1982 9 (4): 199–200, 202–4, 206–8.
4. Holloway PJ; Moore, W.J. "The role of sugar in the etiology of dental caries 1983 189–213.
5. Moore WJ; Moore, W.J. "1. Sugar and the antiquity of dental caries". J Dent 1983 11 (3): 189–90.
6. Rugg-Gunn AJ, Murray JJ "2. The epidemiological evidence". J Dent 1983 11 (3): 190–9.
7. Drucker DB "4. The microbiological evidence". J Dent 1983 11 (3): 205–7.
8. Rogers AH. Molecular Oral Microbiology. Caister Academic Press. 6th edition. Page 356
9. The American Academy of Periodontology. Proceedings of the World Workshop in Clinical Periodontics. Chicago:The American Academy of Periodontology; 1989:I/23-I/24
10. Ammons, WF; Schectma, LR; Page, RC. Host tissue response in chronic periodontal disease I: The normal periodontium and clinical and anatomic manifestations of periodontal disease in the marmose. J Perio Res 1972; 7: 131
11. Cameron CE. Cracked-tooth syndrome. J Am Dent Assoc 1964; 68(March):405-11

12. Ehrmann EH, Tyas MT. Cracked tooth syndrome: diagnosis, treatment and correlation between symptoms and post-extraction findings. Aust Dent J 1990; 35(2):105-12.
13. Rosen H. Cracked tooth syndrome. J Prosthet Dent 1982; 47(1): 36-43
14. Zadik Y, Sandler V, Bechor R, Salehrabi R Analysis of factors related to extraction of endodontically treated teeth". Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008 : 106
15. Morant H. "NICE issues guidelines on wisdom teeth". British Medical Journal 2000: 320
16. "Opposition to Prophylactic Removal of Third Molars (Wisdom Teeth) . Policy Statement Database. American Public Health Association. 2008 10-28.
17. Gaud RS, Jain DK, Kaskhedikar SG, Chaturvedi SC. Critical Evaluation of present prescribing pattern. Indian J Hosp Pharm 1989:26:70-72.
18. .Benet LZ." Principles of prescription order writing and patients compliance instructions. In: Goodman AG, Rall TW, Nies AS, Taylor P, (eds). Goodman and Gilman's "The pharmacological basis of therapeutics." 8th ed. New York: Pergamon Press Inc. 1991:1640.
19. Puthawala AK, Mansuri SM. "Pharmacy practicals for medical students 2nd ed. Ahmedabad: 1986:13-5.
20. Budhiraja RD. Manual of Practical Pharmacy. 2nd ed. Bombay Popular Prakashan, 1993
21. ICH Harmonised Tripartite Guideline for GCP, Institute of Clinical Research, 1996.
22. Barry M. "Ethical considerations of human investigation in developing countries: the AIDS dilemma". The New England Journal of Medicine 1988 319 (16): 1083–6.
23. World Medical, Association "Proposed revision of the Declaration of Helsinki". Bulletin of medical ethics 1999 147: 18–22.
24. Nicholson, RH; Crawley, FP "Revising the Declaration of Helsinki: a fresh start". Bulletin of medical ethics 1999 151: 13–7
25. Boehringer PA, Rylander J, Dizon DT, Peterson MW. Improving the Quality of the Orderwriting Process for Inpatient Orders in a Teaching Hospital. Q Manage Health Care 2007; 16(3):215-218.
26. Berwick DM, Winickoff DE. The Truth About Doctors' Handwriting: A Prospective Study. BrMed J 1995; 313:1657-1658.
27. Lyors R, Payne C, Mc Cabe M, Fielder C. Legibility of Doctors' Handwriting: quantitative Comparative Study. Br Med J 1998; 317(7162):863-4.
28. Kripalani M, Badanapuram R, Bell A. Audit on Inpatient Prescription Writing Guidelines. J Psychiatr Ment Health Nurs 2007; 14(6):598-600.
29. Winslow EH, Nestor VA, Davidoff SK, et al. Legibility and completeness of physicians' handwritten medication orders. Heart Lung. 1997; 26:158–64.
30. Anacleto TA, Perini E, Rosa MB, et al. Medication errors and drug-dispensing systems in a hospital pharmacy. Clinics (SaoPaulo). 2005; 60(4):325–32
31. Shrank WH, Hoang T, Ettner SL, et al. The implications of choice: prescribing generic or preferred pharmaceuticals improves medication adherence for chronic conditions. Arch Intern Med. 2006; 166: 332–7.

32. de Vries TPGM, Henning RH, Hogerzeil HV, et al. Guide to good prescribing. A practical manual. Geneva: World Health Organization Action Programme on Essential Drugs. WHO/DAP/94.11; 1994. Available online at: http://whqlibdoc.who.int/hq/1994/ WHO_DAP_94.11.pdf.