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Research article

PRESCRIPTION AUDITING AND COST COMPARISON ANALYSIS OF CHEMOTHERAPEUTIC AGENTS IN AN ONCOLOGY UNIT OF A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

The main aim of this study is to monitor the appropriateness of various parameters in the prescription and selection of suitable of brand of chemotherapeutic agents. Prescription audit is a technique and its application is science as well as an art. The objectives are to observe the different types of prescription audit parameters and to study cost comparison analysis of various brands of chemotherapeutic agents. It can inform the appropriateness of various parameters in the prescription and the average number of drugs per prescription. It can provide the socio-demographic characteristics of patients in the oncology unit. The background of current study was conducted at tertiary care teaching hospital of Karnataka. It was an observational study performed in 300 prescriptions and 150 cases from 3 pharmacies and an oncology unit for a period of 6 months. Daily visit was made on pharmacy and wards for data collection. Prescription auditing showed that 100% name, 94% age, 76% date and duration mentioned in 87% and in an average, there are 4 drugs per prescription. Commonly prescribed high cost onco drugs are Paclitaxel Rs.4236 (Cipla Company) and Ristova Rs.35704.98 (Roche Company). Prescription audit is an important mechanism to improve the quality of care afforded by the hospitals. The observed results of auditing showed that the prevailing prescribing habits of the institution and it are very essential to improve prescribing habits. The conducted study was helped to improve ability of pharmacists to demonstrate competence, to be aware of levels of competence and to identify learning needs further exploration.

Key Words:- Prescription auditing, chemotherapeutic agents, prescribing pattern, cost Running Head: Cost comparison analysis of chemotherapeutic agent.

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INTRODUCTION

Prescription examination has the colossal potential to support the reasonable usages of drugs and essential medicine (Debasis B *et al.*,2014). A Prescription is a health care programme implemented by a physician or other qualified health care practitioner in the form of instruction that govern the plan of care for an individual patient. It is a written command compounding, dispensing and administering drugs to a specific client or patient and once it is sign by the physician, it becomes an officially permitted document. Prescription examination is an objective documentation to the doctors for their conformation of care and their own value (Hanumantha *et al.*, 2011). Medical auditing helps for making

improvements in patient care (Nilay D *et al*., 2015). It is the critical examination of the quality of medical care, including the events used for diagnosis and treatment. Prescription examination is a part of medical audit (Robinson *et al*., 1994). Thus medical audit is a systemic advance of medical care in order to identify opportunities for improvements and provide a mechanism for realizing them (Barton A et al., 1995). Actually, medical audit provides a personal and professional connection between the doctors and the patients. Academic literature and skilled colleagues are the two factors which determining the physician's prescribing performance in the hospitals. Audit parameters are name, age, date, superscript, route, inappropriate abbreviation, duration, number of drugs present, refill and signature of doctor. The well-known plan of pharmacist prescribing is to improve patient admittance to medicine, making the best use of pharmacists' clinical skills'. Pharmacists in the UK with at least two years post-registration professional skill can now qualify and list as self-determining prescribers (Derek et al.,2009). The triumphant implementation of pharmacist independent prescribing services will be improved by rigorous evaluation of pharmacist supplementary prescribing in terms of structures, processes and outcomes. When prescribing, there are numeral points to take into explanation. Many of doctors do this involuntarily. Prescribe only when necessary and consider benefits against risks. Engage the patient in decisions about their care and respect patient's opinion. Note the patient's age, medical history (especially any hepatic/renal dysfunction) and any concurrent medication. Assume about dosage cautiously; manufacture's recommended doses are based on population studies and assume 'one dose fits all'. A prescribing error is a failure in the prescribing practice that leads to, or has the potential to hurt the patient. By auditing or analyzing prescription helps to reduce these type of medication error by focusing on the prescribing pattern like name, age, superscription, refill, route, inappropriate abbreviation, signature, remark, and the failure of the patient to adhere to the prescribed medication regimen. Several studies on the prescription auditing in different parts of the world shaped their own database for an extra comparative study. In this viewpoint the current study was conducted at Father Muller Medical College hospital with the following objectives of monitor the appropriateness of various parameter in the prescription, cost of various brands of chemotherapeutic agents, analyze the average number of drugs per prescription, socio-demographic characteristics of the patients in the oncology unit. As a result of prescription auditing, a miraculous quality of life can be offered to all levels of health care delivery system (Debasis*et al*.,2014). The plan of current study is to estimate the prescription audit parameters and to pick a suitable brand of chemotherapeutic agent which is reasonably priced and has good efficacy.

METHODS

DESIGN

An observational (non-experimental) study conducted in the patients admitted in the oncology wards and pharmacy department of Father Muller Medical College Hospital, Karnataka for a time of 6 months from September 2016 to February 2017.

SAMPLING OF CASE-STUDY SITES

Daily visit was made to the pharmacy and oncology department for prescription and case file collection. Patient demographic details like name, age, sex, nationality, height and the cost of chemotherapeutic agents were noted in specially designed patient documentation form. Diagnosis, type of cancer, social history, drugs involved, generic name, and brand name was recorded daily in-patient data collection form. Name, age, date, superscript, legibility, route, duration, number of drugs prescribed and signature noted in the patient prescription audit form. Prescriptions for auditing were collected from the pharmacy department.

DATA MANAGEMENT AND ANALYSIS

The collected data created separately and analyzed in computer using Microsoft office excel (windows7; version 2007). Descriptive statistics such as frequencies and percentages were designed for categorical variables.

ETHICAL APPROVAL

Research was approved by the Institutional Ethics Committee of Father Muller Medical College Hospital, Mangalore
[Ethical approval number FMMC/FMIES/3051/2016].

RESULTS AND ANALYSIS

The fine points of each prescription were analyzed as per the following parameters, monitoring the appropriateness of various parameters in the prescription and analyzing the average number of drugs per prescription **Graphical Abstract**. Prescription examination showed that the average number of drugs per prescription was 4. 100% prescriptions contain name, age mentioned in 94.66%, 76% of prescriptions contain date. Only 27% of prescription showed moderate legibility. Drug substitution was present in 15.33%, 97% of the prescription contain signature and remark present in only 21% of prescriptions. The percentage of drugs prescribed by generic name was 43.3%. The percentage of encounters with an antibiotics prescribed was 36.6%. The percentage encounter with an injection prescribed was only 16.6%. Percentage of drugs prescribed from essential drug list or formulary was 50%. Detailed study of appropriateness of parameters in the prescriptions is shown at **Table 1**.

DEMOGRAPHIC CHARACTERISTICS OF PATIENTS IN THE ONCOLOGY UNIT

This study focused on the demographic characteristics of the patient in the oncology unit is shown at **Table 2**. Data was collected from 150 patients including men, female and children where 60 sheets from Y ward, 50 from X ward and 40 from semiprivate ward. Socio-demographics are nothing further than characteristics of a population. General features such as age, gender, ethnicity, education level, income, type of client, years of experience, location, are considered as socio-demographics. Different index variables are formed on the basis of socio-demographic variables. A total of 300 cancer patients admitted in FMMCH in 6 months of study time. Out of them, some patient's data could not be obtained, hence 150 patients constituted as the study sample. Most (73.3%) patients were in the age group 12-60 years. Only 1.3% were aged below 12 years and 25.3% were of age 61 years or older. On gender basis more females (61.3%) had admitted than males (38.6%)**.** Overall, 91.3% were married and social histories were present in 82%**.** According to height most (50%) patients were in the group 161-170cm. Only 12.7 % patients were in the range 171-180cm, remaining 37.3% in the range of 150-160cmwas represented in **Table 2**. Socio-demographic characteristics are categorized on the basis age, gender, marital status, social histories, and heights which are shown in the **Figure 1-4.**

SELECTION OF SUITABLE BRAND OF CHEMOTHERAPEUTIC AGENTS

300 drug's costs were analyzed from this oncology unit, 86 were chemotherapeutic agents, remaining were anti-emetics, painkillers, antibiotics and others are supportive drugs. From this study, the commonly prescribed supportive drugs in cancerous patients were Pantaprazole, Voveron, Morphine, Emeset, Perinorm and Rantac. Mostly prescribed high cost chemo drug is Paclitaxel from Cipla company. Cipla, Roche and Zydus were providing medicines to the oncology unit of this hospital. Most of patients under credit type, so they can afford the price of their medication. As the result of comparison Imat from Cipla (Rs.172) is cheaper than Veenat from Natco Rs.582 .Ristova from Roche and Reditux from Dr.Reddy are almost same**.** When comparing Ristova from Roche company and Mabtas from Intas, showed a wide variation as well as Ciprobid from Zydus is cheaper than Ciplox from Cipla company. The cost comparison of different brands of onco drugs were shown in the **Figure 5-8.**

Table 1: Appropriateness of various parameters in the prescriptions

Parameters	particular item	No: of prescription	% out of total 300 prescriptions
Superscription	Name written	300	100
	Name not written	0	0
	Age mentioned	284	94.66666667
	Age not mentioned	16	5.333333333
	Date mentioned	228	76
	Date not mentioned	72	24
Inscription	Legible moderate	81	27
	not legible	211	70.33333333
	Good legibility	8	2.666666667
	Route mentioned	55	18.33333333
	Route not mentioned	8	2.666666667
	Inappropriate abbreviation present	67	22.33333333
	Duration mentioned	261	87
	Duration not mentioned	30	10
Drug substitution	Present	46	15.33333333
	Not present	254	84.66666667
Remark	Present	63	21
	Not present	237	79
Refill	present	81	27
	Not present	219	73
Signature	Present	291	97
	Not present	9	3

Table 2: Socio-demographic Characteristic of the patients in the oncology unit

Characteristics	Number of patients	Percentage n=150
Age below 12 years	2	1.333333333
12-60 years	110	73.33333333
61-75 years	38	25.33333333
Nationality: Indian	150	100
Gender: Male	58	38.66666667
Female	92	61.33333333
Married	137	91.33333333
Unmarried	13	8.666666667
Social Histories: Present	123	82
not present	27	18
Height 150-160 cm	56	37.33333333
161-170cm	75	50
171-180cm	19	12.66666667

Graphical Abstract

Prescription Auditing and Cost Comparison Analysis of Chemotherapeutic Agents an oncology Unit of Atertiary Care Teaching Hospital.

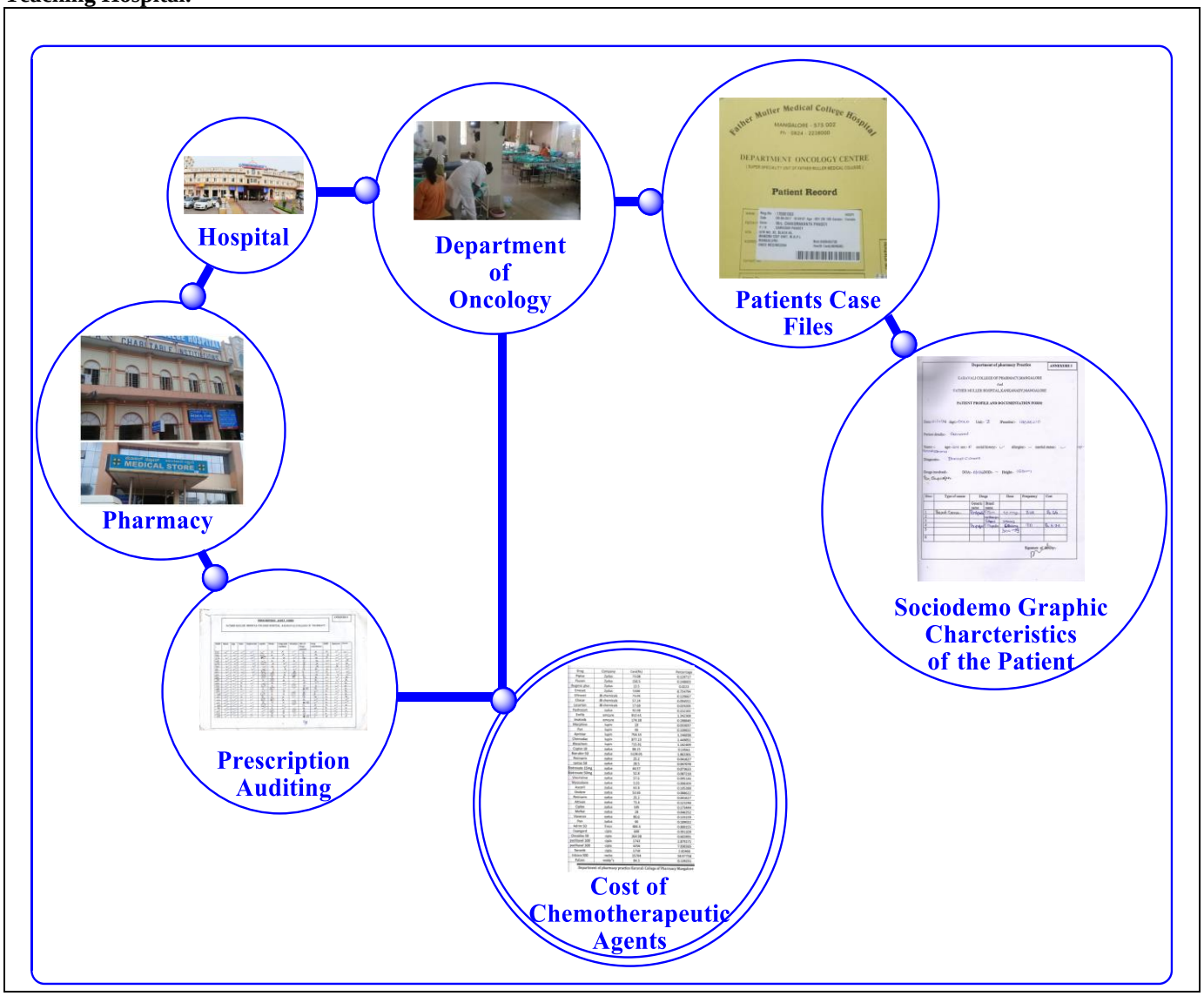


Fig.1-4. Socio-demographic characteristics are categorized on the basis age, gender, marital status, social histories, and heights

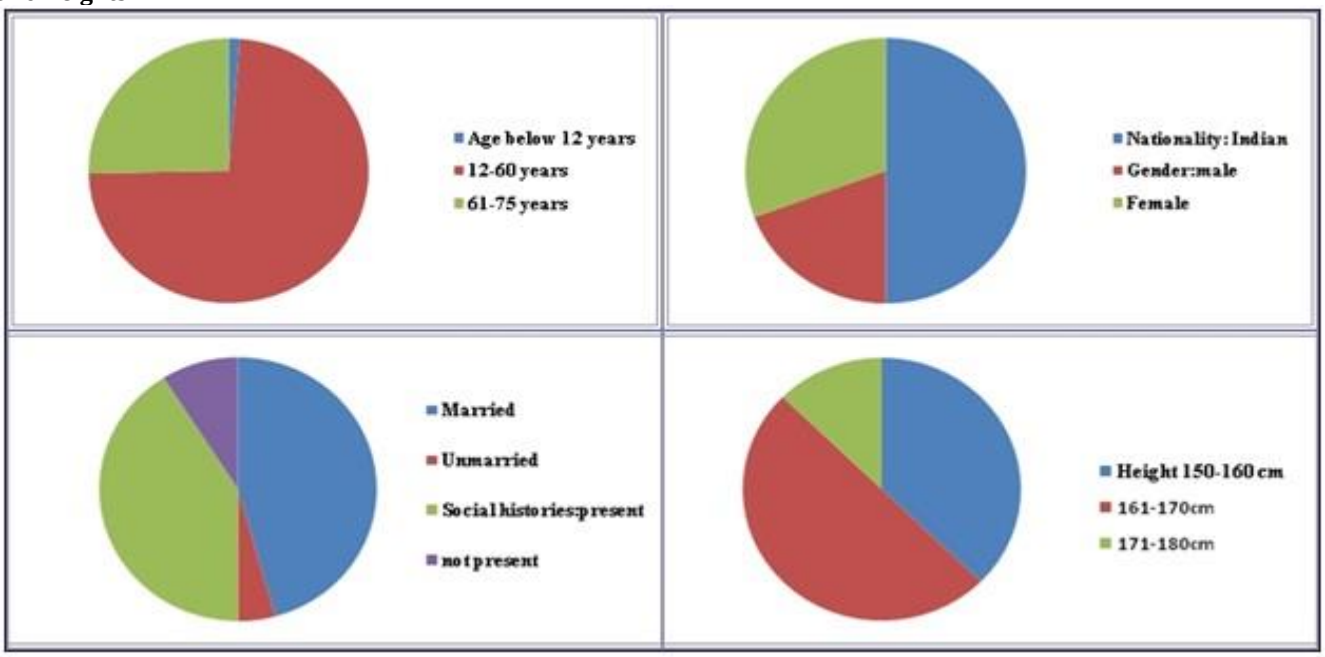
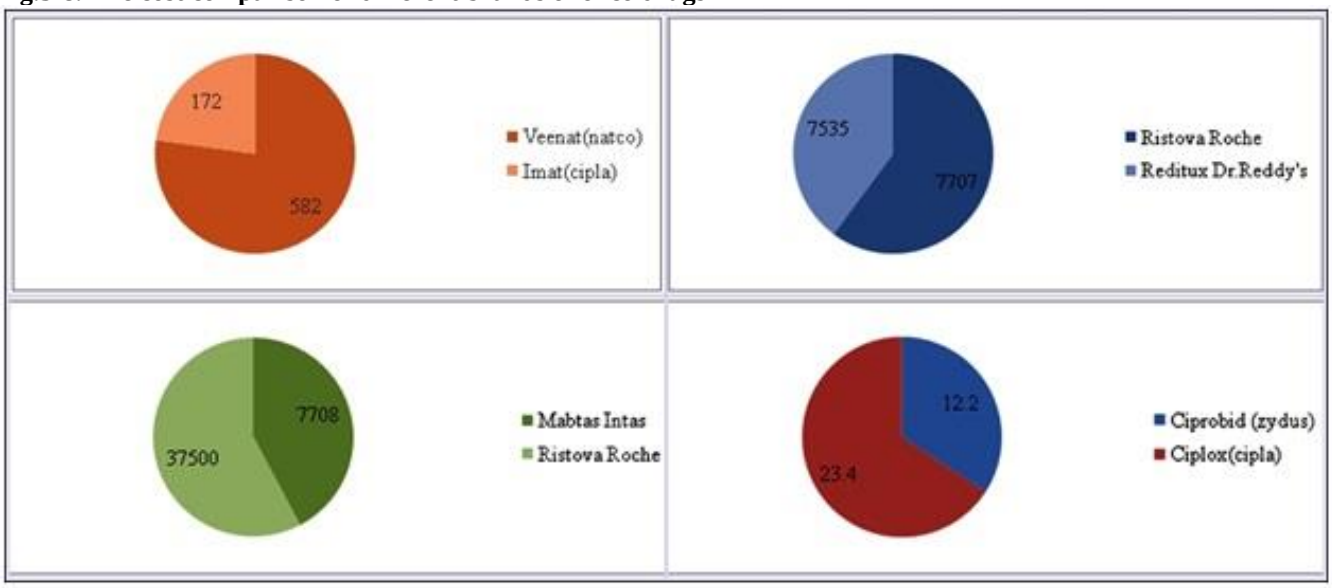


Fig.5-8. The cost comparison of different brands of onco drugs



DISCUSSION

Prescription audit is a part of medical review and is seen as one approach to recovering the quality of patient care[26]. It is a critical assessment of medical and health care related system with a view to bring about needed improvement in the same[1].Through the process of reviewing the prescription audit helps to identify deficiencies so that they may be remedied[27]. The main intention of this study is to estimate the appropriateness of prescription audit parameters and to pick a suitable brand of chemotherapeutic agent which is affordable to the patient. In adding together, audit was seen to support communication between partners and as a motivation to learn from colleague's behaviour[33]. During 6 months study period, 300 prescriptions audited from 3 pharmacies and 150 files collected from the oncology general wards and semiprivate ward to find out the socio-demographic characters and cost details of the chemotherapeutic agents. The data collected were analyzed and summarized accordingly. This study focused on the pharmacy and oncology units. From the first pharmacy, 110 prescriptions were analyzed from 54 males and 56 females. 90 prescriptions were analyzed from the new pharmacy (30 males and 60 females). 100 prescriptions were analyzed

from third pharmacy (46 males and 54 females). It showed that the average number of drugs per prescription was 4. 150 cases were collected from the oncology unit. Demographic details showed that female and male proportions are 61.33% and 38.66% . Common type of cancer was found to be breast cancer and the commonly prescribed supportive drugs were Morphine, Emeset,

Perinorm and Domperidone. 60 cases collected from Y ward, 50 from X ward and 40 from semiprivate ward. Features are characterized based on age, nationality, gender, marital status, social histories and height. In the selection of suitable brand of chemotherapeutic drugs, cost of drugs were collected from the above mentioned sample population and recorded it in the patient documentation form. In this study the commonly prescribed drugs in cancerous patients were pain killers and antiemetics. Mostly prescribed high cost chemotherapeutic drug from Cipla company (Paclitaxel-selling price Rs.4236). The high cost chemotherapeutic agent was Ristova (Rituximab) from Roche company Rs.37500. Zydus company providing low cost chemotherapeutic agents (Fluorouracil 9250ng/ml). Actual price of the chemotherapeutic agents have high difference compared to its selling price. Most of the patients were under credit type or own health card, so that they can afford the price even if it is high. By comparing the cost of drugs, Pipperacillin and Maclodex were found to be Rs.390 and Rs.112 but antiemetics like Ondanserton from Zydus and Cipla was almost same (Rs.4.55 and Rs. 4). Tamodex from Fresi (Rs.1.70) was cheap compared to Nolvodex from Astracompany (Rs. 4.21). Xeloda from Roche was high (Rs. 101.09) compared to Capegard from Cipla (Rs.30.78). Paclitaxel from Cipla was to be high (Rs. 1777.78) compared to Petaxel from Zydus (Rs.1500). Ristova from Roche was cheap (Rs.2750) compared to Redituxe from Dr. Reddy's (Rs.18194). Sorafinib (48.1) from cipla was cheap compared to Sorafenet (225.5) from Natco. It is the procedure of delivering the medical care and also benefited to the community services . Several studies reported that clinician had benefited from audit through improvements in communication between professional groups. The outcome of the prescription auditing is to improve the patient's care and to develop a healthy community. From the 300 audited prescription 100% contain name, 5.3 % not mentioned age. Age is an important parameter to design a drug therapy. 76% of the prescription contains date, 70% is not legible, 57% route mentioned, 87% duration mentioned and 97% of the prescription containing signature. From this study the average number of drugs per prescription was 4 and the percent of drugs prescribed by generic name was only 43.3 %. As in other Indian studies it was low 20.99%, 3.79%, 35%. So our hospital has good result for that, percent encounters with an antibiotic was 36.6%. In different countries this is between 29% to 43% have moderate when compared to our study. Percent of injection prescribed in this study was 1.66%, but other countries are from 02%-48%, indicating appropriate prescription of injection, where in percent of drugs prescribed from essential drug list formulary was 50% where as in Karnataka 75.1%.

CONCLUSION

Prescription auditing plays a vital role in medical field. The study of prescribing pattern and the selection of suitable cost effective brand of chemotherapeutic drugs from the pharmacy and oncology unit is highly effective and beneficial to the physicians, patients and also to the hospital administrators. The present study was aimed to evaluate and audit the prescriptions according to the parameters and selection of suitable brand of chemotherapeutic agent as well as the evaluation of the socio-demographic characteristics of the patients from the oncology unit within the limited sample mentioned in the protocol. From the prescription auditing, the average number of drugs per prescription was moderate and good. This study showed that the prescribing pattern is good and cost comparison of different brands of drugs shows that the patients are able to afford the treatment. This is achieved through the mutual cooperation between management and pharmaceutical companies.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare and no funding from anywhere.

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