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## Assessment of Availability, Accessibility and Affordability of Medicines in a South Indian Hospital.

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SHOBHA CHURI AND B. G. NAGAVI\*

Department of Pharmacy Practice, JSS College of Pharmacy, S. S. Nagar, Mysore-570 015

A study was initiated with the development and collection of background, structural, process and outcome indicators for a South Indian Jagadguru Sri Shivarathreeswara Hospital as suggested in the WHO manual, which focuses on the availability, accessibility, and affordability of essential medicines. The information on diseases that are commonly treated in the hospital (key diseases) and medicines that are used to treat such diseases (key medicines) were collected and the availability of these key medicines was assessed. Based on this study it was found that, excess numbers of analgesics, antipyretics, and non-steroidal antiinflammatory drugs (367% more), antiallergics (340% more), anti-bacterials (80% more), antimigraine medicines (75% more), cardiovascular medicines (135% more), dermatological medicines (59% more), diuretics (75% more), gastrointestinal medicines (157% more), psychotherapeutic medicines (322% more), and hormones and other endocrine medicines (58% more) were available in drug store of the hospital. Medicines such as antidotes (64% less), antiinfective (40% less), antiviral (62% less) and immunologicals (50% less) were not available in adequate numbers. However, the availability of key medicines was good (94 %). Comparison of affordability of the treatment of enteric fever was performed between ceftriaxone and ciprofloxacin drugs, and basket of food. The cost of treatment using ceftriaxone (Rs. 65.4) was 2.1fold more where as it was 2.3 fold less for cost of treatment using ciprofloxacin (Rs. 13.83) when compared to the cost of basket of food (Rs. 30.87). In addition to the availability, accessibility and affordability study, cost minimisation and cost effectiveness study was also performed between three medicines viz., atenolol, amlodipine and enalapril which are used in the treatment of hypertension. It was found that atenolol was found to be cost effective drug when compared to amlodipine and enalapril for hypertension.

Effective health care requires a judicious balance of preventive and curative services. A crucial and often deficient element in curative services is an adequate supply of medicines. An increasing number of pharmaceutical formulations are available in the world market and also a rapid growth is observed in both drug consumption and expenditure. However, many people in developing or developed countries are unable to obtain the drugs they need, because, either they are not available or too expensive. Trained professionals to prescribe the drugs rationally are

also not available in these countries<sup>1</sup>.

Essential medicines are those, which satisfy the priority of health care needs of the population. They are selected with due regard to public health relevance. Essential medicines are intended to be available within the context of functioning health care system at all the time in adequate amount, in appropriate dosage forms with assured quality and adequate information and at a price an individual or community can afford<sup>2-3</sup>. Availability is the relationship between the type of product or service needed and the type and quality of the product or service provided locally. Geographic accessibility refers to relationship between the location of product or service and the location of the eventual

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\*For correspondence

E-mail: jsspharma@lycos.com

user. Affordability is the relationship between the price of the product or service and the user's ability to pay for it. In addition to availability and accessibility, the cost of therapy (affordability) has become an increasingly important factor to consider while selecting the drugs to treat various diseases<sup>4,5</sup>. Careful selection of essential medicines results in a higher quality care and cost effective use of health care resources. The implementation of the concept of essential medicines is intended to be flexible and adoptable to many different situations. It is the individual country's responsibility to select medicines, which are essential to suit nation's requirement<sup>2,3</sup>.

The WHO model list has been updated every two years since 1977. The model list of 2002 contains 325 medicines<sup>3</sup>. In recent years, an increasing number of brands for one particular drug have been introduced into the market re-

sulting in increased procurement and investment cost as well as difficulty in various stages such as distribution and stocking, inventory management, provision of proper storage conditions and management of expired drugs.

Jagadguru Sri Shivarathreeshwara (JSS) Hospital is a multispeciality teaching hospital with 1200 beds catering to the needs of people from Mysore and nearby districts at economical cost. The hospital has three pharmacy outlets; one main drug store which caters to both inpatients and out patients, one adjacent to emergency ward and one adjacent to the out patient department. The hospital has individual prescription drug distribution system and hospital does not have ward pharmacy and hospital formulary. The principal objective of the study was to assess the availability, accessibility and affordability of medicines in JSS hospital.

TABLE 1: LIST OF FORMULAE THAT WERE USED IN COLLECTING THE DATA FOR PROCESS INDICATORS

Indicators code	Formulae used
PR 1	$\frac{\text{Number of drugs from the national essential medicines list (EML) prescribed}}{\text{Total number of drugs prescribed}} \times 100$
PR 2	$\frac{\text{Number of drugs from the national essential medicines list (EML) sold}}{\text{Total number of drugs sold}} \times 100$
PR 3	$\frac{\text{Value of drugs purchased through competitive tender}}{\text{Total number of drugs purchased}} \times 100$
PR 4	$\frac{\text{Average lead time for a sample of orders in the last year}}{\text{Average lead time during the past three years}} \times 100$
PR 5	$\frac{\text{Average time between order and delivery from central store to remote facilities in the last year}}{\text{Average time between order and delivery in the past three years}} \times 100$
PR 6	$\frac{\text{Average stock out duration for a basket of drugs in a sample of remote facilities in the last year}}{\text{Average stock out duration for the same drug basket in the past three years}} \times 100$
PR 7	$\frac{\text{Number of issues of independent drug bulletins published in the last year}}{\text{Average number of issues of independent drug bulletins published per year for the last 3 year}} \times 100$
PR 8	$\frac{\text{Average number of copies of independent drug bulletins sent to prescribers}}{\text{Total number of Prescribers}} \times 100$
PR 9	$\frac{\text{Amount spent on public education campaigns on drug use}}{\text{Total amount spent on public health education campaigns}} \times 100$

Table showing the formulae used in calculating the data for process indicators

## MATERIALS AND METHODS

### Development and collection of background, structural, process and outcome indicators:

Indicators were developed in four broad groups as suggested by the WHO manual focusing on the availability, accessibility and affordability. The indicators were developed with appropriate modifications to suit the health facility of JSS hospital, Mysore. Among the indicators listed in the WHO manual, 9 background, 18 structural, 9 process and 4 outcome indicators were selected for our study. Particularly, data for background indicators (BI) was collected from various sources like performance budget book and medical records available in the JSS hospital. The structural indicators (ST) were answered "Yes or No" based on information available at the administration level. Information about the indicators was collected at outlet level and data for each of the structural indicator was collected from official publications, budget books, and personal interviews with administrators of the J. S. S Hospital, Mysore. Furthermore, process indicators (PR) data was collected from drug store and drug information center. To collect data for PR1, a form was prepared that contains the total number of prescriptions, drugs prescribed from the essential medicines list, and drugs that are not prescribed from the essential medicines list. Another form was prepared to collect data for PR 2, that contains the total number of prescriptions, the number of drugs from essential medicines list sold, and the number of drugs not sold from essential medicines list. The method of collection of relevant information for PR1 and PR2 involves evaluation of 30 prescriptions in a day in the drug store of the JSS Hospital. The collected data was con-

verted into percentage value for each indicator by using the formulae (see Table 1) given in the WHO manual<sup>6</sup>.

Various forms were prepared in order to collect the data for outcome indicators (OT) 1, 2, 3 and 4. The availability of basket of drugs (OT1) in the drug store was investigated by inspecting the drug store. The collected data was converted into percentage % value. Furthermore, survey was performed in the drug center to check the availability of lowest price drugs (OT2) that are listed in basket of drugs. The average retail price of basket of food was compared with the average retail price of standard treatment for enteric fever while collecting the data for (OT3). The value of basket of drugs with cheapest drugs available in the drug store was calculated (OT4). Various formulae are used while collecting outcome indicators. The formulae are given in Table 2<sup>6</sup>.

### Comparison of medicines available in the drug center of the JSS hospital with essential medicines list:

A list of medicines that are available in drug store of the JSS hospital was prepared according to their therapeutic category and prepared list was compared with the essential medicines list prepared by WHO. The number of major category of drugs available in JSS Hospital is given in the Table 3.

### Preparation of list of key diseases and key medicines:

The major diseases (key diseases) encountered in the JSS hospital and medicines (key medicines) used for their treatment was obtained from the information given by the physicians working in JSS hospital. A proforma was pre-

TABLE 2: LIST OF FORMULAE THAT WERE USED IN COLLECTING THE DATA FOR OUTCOME INDICATORS

Indicator code	Formulae used
OT 1	$\frac{\text{Number of drugs from a basket of drugs available in pharmacy}}{\text{Total number of drugs in the same basket}} \times 100$
OT 2	$\frac{\text{Number of drugs at the lowest price from a basket of drugs}}{\text{Total number of drugs in the same basket}} \times 100$
OT 3	$\frac{\text{Average retail price of standard treatment of enteric fever}}{\text{Average retail price of a basket of food}} \times 100$
OT 4	$\frac{\text{Value of a basket of drugs in the private sector}}{\text{Value of the same basket with cheapest drugs in the private sector}} \times 100$

Table showing the formulae used in calculating the data for outcome indicators

TABLE 3: COMPARISON BETWEEN LIST OF MAJOR CATEGORY OF DRUGS AVAILABLE IN THE JSS HOSPITAL AND DRUGS THAT ARE GIVEN IN ESSENTIAL MEDICINE LIST.

Category of drugs	No. of drugs in essential medicines list	No. of drugs in JSS Hospital	Status
Non-opioid analgesics, antipyretics and NSAIDs	3	14	367% more
Antiallergics	5	22	340% more
Antibacterials	25	45	80% more
Antimigraine medicines	4	7	75% more
Cardiovascular medicines	20	47	135% more
Dermatological medicines	22	35	59% more
Gastrointestinal medicines	14	36	157% more
Psychotherapeutic medicines	9	38	322% more
Diuretics	4	7	75% more
Hormones & other endocrine medicines	19	30	58% more
Antidotes	14	5	64% less
Anti-infective medicines	10	6	40% less
Antiviral medicines	13	5	62% less
Immunologicals	22	11	50% less
Antiparkinsonism medicines	2	2	100% match
Antiseptics	3	2	33% less
Ophthalmologic preparations	10	9	10% less
Electrolytes	12	12	100% match

Table showing the comparison of lists of drugs available in the hospital and essential medicines lists

pared to collect the list of key diseases and key medicines. It was given to the doctors (n=20) of general medicine department with a request to provide information regarding diseases encountered in the hospital in order of frequency and the medicines usually used to treat those diseases. These diseases and medicines were considered as key diseases and key medicines (see Table 4).

#### Comparison of basket of drugs with basket of food:

Medicines that are prescribed for the treatment of enteric fever in the JSS hospital were considered as basket of drugs. Enteric fever was one amongst the key diseases and was selected randomly for cost comparison of drugs prescribed. The cost of the basket of drugs was estimated by considering quantity of drug formulations used (dose and dosage regimen) and averages of prescribed brands.

Ciprofloxacin and ceftriaxone were selected randomly in our study and data collection form was prepared and used during the study. This form contained about the drugs prescribed for the treatment of enteric fever, drugs price and total price of all the drugs. The basket of food was prepared based on daily requirements for an individual. Adding the price of the selected basic products and dividing it by number of stores surveyed obtained the cost of basket of food. The average retail price of standard treatment of enteric fever to that of average retail price of a basket of food was calculated by using the following formula<sup>3</sup>, (Average retail price of standard treatment of enteric fever/Average retail price of a basket of food)x100

#### RESULTS AND DISCUSSION

Background indicators that provide the information on

TABLE 4: LIST OF KEY DISEASES AND KEY MEDICINES

Disease	Medicines	
Malaria		
P. malaria	quinine	artemeter
V. malaria	chloroquine	primaquine
Tuberculosis	isoniazid	rifampicin
	pyrazinamide	ethambutol
Enteric fever	ciprofloxacin	ceftriaxone
Diabetes mellitus		
Type I	insulin (short, intermediate, long acting) Human & Porcine insulin	
Type II	glimepiride, metformin, pioglitazone	
Hypertension	atenolol, analpril	amlodipine
Asthma	salbutamol	theophylline
Leptospirosis	Crystalline penicillin	doxycycline
IHD	aspirin ISMN	glyceryl trinitrate
Acute MI	aspirin heparin	morphine
COPD	salbutamol	ipratropium bromide
Anemia	ferrous sulphate	folic acid
Pneumonia	Crystalline penicillin	cefuroxime
APD	ranitidine antacids	Omeprazole
Acute GE	ciprofloxacin	lactobacillus
HIV	lamuvidine	ziduidine
UTI	norfloxacin	gentamycin

Table showing the list of key diseases and key medicines used in the present study

various aspects of the health facilities and economical status of the hospital were selected for our study (see Table 5). These indicators provide the quantitative data and can be used to identify the major problems in the health facilities and drug center of the hospital. The number of outpatients who utilized the health facilities of the hospital was 10 times more than that of inpatients. The average number of inpatients and out patients who utilized the health facilities in the year 2001-2002 was more when compared with past 5 years (see Table 5). The hospital is having 209 prescribers and 3 drug outlets. Furthermore, the expenditure on drugs was Rs. 29 lacs and total expenditure on health facilities of the hospital was Rs. 795.19 lacs. The expenditure on drugs was 3.6 % of the total expenditure, indicating the need for higher investment on drugs to improve their availability and accessibility. The structural indicators were answered "Yes or No" based on information usually available at the hospital level, with a "Yes" response intended to be positive (see Table 6). Many "No" answers suggest that improvements are required in hospital capacity, if the drug center is to make significant progress.

The indicators provide quantitative information on the processes by which a drug policy can be developed and implemented. These indicators can be used as quantitative data for decision makers and senior management to achieve the goals and targets set by the hospital. Results of process indicators along with comments on their obtained results are presented in Table 7. Furthermore, four outcome indicators were used in the present study to assess the accomplishment of the objective of the hospital. The results of outcome indicators are presented in Table 8. The information on outcome indicators will help members of health management of the hospital to attain the objectives.

TABLE 5: BACKGROUND INDICATORS OF JSS HOSPITAL MYSORE

Indicator Code	Name of the indicator	Results
BG 1	Total number of inpatients in the year 2001-2002	22616
BG 2	Total number of outpatients in the year 2001-2002	219157
BG 3	Average annual increase in inpatients/year	485
BG 4	Average annual increase in outpatients/year	4628
BG 5	Total mortality rate in the year 2001	965
BG 6	Total number of prescribers	209
BG 7	Total health expenditure for 2002-2003	795.19*
BG 8	Total expenditure on drugs for 2002-2003	29.00*
BG 9	Total number of drug outlets	3

Table showing the results of background indicators used in the present study. \*Rs. in lacs

TABLE 6: STRUCTURAL INDICATORS OF JSS HOSPITAL

Indicator	Description	Status	Comments
ST 1	Is there an official drug policy document updated in past 10 years?	No	The hospital is not following national drug policy
ST 2	Is there a drug regulatory authority whose mandate includes inspection?	No	Hospital does not have drug regulatory authority
ST 3	Are pharmacists legally entitled to substitute generic drugs for brand name products?	No	Pharmacists are not permitted to substitute the generic or brand name products without the permission of the prescriber
ST 4	Is there a hospital essential drug list/formulary using INN officially adopted and distributed in the Hospital?	No	Hospital does not have essential drug list or formulary
ST 5	Is there an official drug committee whose duties include updating the EML /hospital formulary?	No	There is no hospital drug committee to update the EML or hospital formulary
ST 6	Is budget spent on medicines is more than 20 % of total health budget of the hospital?	No	The budget spent on medicines is 3.6 % of the total health budget
ST 7	Are drugs usually procured through competitive tender?	No	Drugs are procured on the basis of prescribers frequency of prescribing and discount on drugs price
ST 8	Is there a system to monitoring supplier performance?	No	Suppliers performance is not monitored in the hospital
ST 9	Is the procurement in the pharmacy limited to drugs on the national essential medicines list/hospital formulary	No	Drugs other than essential medicines list also procured in the hospital.
ST 10	Is the average lead time (From order to receipt) less than 8 months?	Yes	The average lead time varies from one day to one month
ST 11	Is procurement based on reliable Quantification of drug needs?	Yes	Procurement is based on need of the hospital
ST 12	Are good storage practices observed in the central procurement/distribution unit?	Yes	Adequate storage facilities have been adopted in procurement unit
ST 13	Is the information recorded on the stock cards for a basket of drugs the same as the quantity of stock in store?	Yes	Recorded information on stock card and store is same
ST 14	Are the stocks for a basket of drugs within their expiry dates in the central procurement/distribution unit?	Yes	Drugs procured and stored were not found expired
ST 15	Have all incoming products been physically inspected for the last three deliveries in the central procurement/distribution unit?	Yes	Physical inspection has been performed on last three deliveries
ST 16	Are drugs which are not listed in the EML/hospital formulary in stock in the central procurement/distribution unit?	Yes	There are many drugs available that are not listed in the EML
ST 17	Is there at least one major incentive for selling essential drugs at low cost?	No	No incentive for selling essential drug that are at low cost

Indicator	Description	Status	Comments
ST 18	Are essential drugs sold under generic name in drug outlets	No	Drugs are sold under only on brand names

Table showing the results of the structural indicators and comments on the obtained results

TABLE 7: PROCESS INDICATORS OF JSS HOSPITAL

Indicator	Description	Status	Comments
PR 1	Number of drugs from the national /Hospital essential medicines list (EML) prescribed out of total number of drugs prescribed	38.3 % of drugs prescribed in drug center are from EML	The number of drugs that are prescribed from the EML are very less and recommended to be more.
PR 2	Number of drugs from the national /Hospital essential medicines list(EML) sold out of total number of drugs sold	34.92 % of drugs sold in drug center are from EML	The number of drugs that are sold from the EML are very less and recommended to be more.
PR 3	Value of drugs purchased through competitive tender, out of value of drugs purchased.	Nil	Drugs are not purchased from competitive tender
PR 4	Average lead time for sample of orders in the last year, out of average lead time during the past three years	Record is not maintained.	Required drugs are obtained immediately after telephonic order and it is recommended to maintain if lead time is high
PR 5	Average time between order and delivery from central store to pharmacy outlets	Immediately after receiving the order	Drugs are supplied immediately.
PR 6	Average stock out duration for a basket of drugs in the central and pharmacy outlets in the last year, out of average stock out duration for the same basket in the past three years	Record of stock out duration for basket of drugs is not maintained	Maintenance of record of stock out duration of basket of drugs in drug center is recommended
PR 7	Number of issues of independent drug bulletins published in the last year, out of average number of issues of independent drug bulletins published per year	Number of issues of independent drug bulletins published in the last year was 100 %	Satisfactory issues of drug bulletins have been published in the last year and need to continue in the similar manner
PR 8	Average number of copies of independent drug bulletins sent to prescribers, out of total number of prescribers.	To all prescribers of the hospital	Drug bulletins have been supplied to all the prescribers of the hospital

Table showing the results of the process indicators and the comments on the obtained results

Medicines available in drug center of the JSS hospital were categorized based on their therapeutic use and compared with the essential medicines list. Conclusions such

as whether available medicines are satisfactory, less or more than that of the essential medicines list were drawn to investigate the availability of all kinds of essential drugs.

TABLE 8: OUTCOME INDICATORS OF JSS HOSPITAL

Indicator	Description	Status	Comments
OT 1	Number of drugs from a basket of drugs available in a pharmacy, out of total number of drugs in the same basket.	94% of the drugs contained in the drug basket were available on the day of survey in drug outlet.	Total no of drugs in basket=38 and No of drugs available =36. This fact finds that the drug center is providing most of the basket of drugs in the hospital.
OT 2	No. of drugs at the lowest price from a basket of drugs, out of total number of drugs in the same basket	60 % of the drugs contained in the drug basket at the lowest price were available the day of survey in drug outlet.	No. of drugs at the lowest price from a basket of drugs = 23 and total number of drugs in the same basket=38. The affordability of the essential drugs still needs to be improved.
OT 3	Average retail price of standard treatment of enteric fever out of the average retail price of a basket of food	Ceftriaxone 212.25% Ciprofloxacin 43.83%	Average total retail price of treatment of enteric fever using Ceftriaxone and ciprofloxacin is Rs. 915.85 and 94.70, respectively. However, the cost per day for Ceftriaxone and ciprofloxacin is Rs. 65.40 and 13.52, respectively. Average cost of basket of food is Rs. 30.87/day. The cost of treatment using Ceftriaxone is 2 fold more where as it is 2.3 fold less for Ciprofloxacin when compared to the cost of basket of food.
OT 4	Value of basket of drugs, out of the same basket with the cheapest drugs.	The value of basket of drugs in the drug outlet surveyed is 107.8% of the value of the same basket with cheapest drugs.	Total value of cheapest drugs is Rs 691 and average total value of drugs is Rs. 741. The number of cheapest drugs available in the drug center is satisfactory.

Table showing the results of the outcome indicators and the comments on the obtained results

Effective management of a health care system involves investing an appropriate amount of money available for various segments of the hospital. One of the important segments of the health care system is drug distribution in the hospital. Furthermore, the investment cost on drug distribution should be managed in such a way that procurement of excess number of drugs of some kind is avoided. Excess investment cost on one particular category of drugs needs high procurement and inventory cost. If a satisfactory number of all categories of drugs are available in accordance with the essential medicines list, investment of high procurement cost on particular category of drugs can be minimized. Based on our study it was found that, excess numbers of analgesic drugs, antipyretic drugs and nonsteroidal antiinflammatory drugs (NSAIDs) (367% more), antiallergics (340% more), antibacterials (80% more), antimigraine medi-

cines (75% more), cardiovascular medicines (135% more), dermatological medicines (59% more), diuretics (75% more), gastrointestinal medicines (157% more), psychotherapeutic medicines (322% more), and hormones and other endocrine medicines (58% more) are available in drug center of the JSS hospital. This clearly indicates high procurement cost on above mentioned category of drugs. Drugs such as antidotes (64% less), antiinfective (40% less), antiviral (62% less), and immunologicals (50% less), are less in number when compared to that of essential medicines. Investment cost on drugs that are in few numbers when compared to essential medicines list should be increased to keep satisfactory number of drugs. However, drugs used in Parkinsonism, antiseptics and disinfectants, ophthalmic agents and electrolytes are in satisfactory number (see Table 3).



TABLE 9: TREATMENT COST OF ENTERIC FEVER USING CEFTRIAXONE

Drug	Dose	Quantity	Private sector		
			Unit price (Rs)	Cost of the treatment (Rs)	Cost of the treatment/day (Rs)
Ceftriaxone	1 gm	14	65	910	65.4
Paracetamol	500 mg	9	0.65	5.85	
Total				915.85	

Table showing the treatment cost of enteric fever for the drug ceftriaxone

TABLE 10: TREATMENT COST OF ENTERIC FEVER USING CIPROFLOXACIN

Drug	Dose	Quantity	Private sector		
			Unit price (Rs)	Cost of the treatment (Rs)	Cost of the treatment/day (Rs)
Ciprofloxacin	500 mg	14	6.50	91	13.83
Paracetamol	500 mg	9	0.65	5.85	
Total				96.85	

Table showing the treatment cost of enteric fever for the drug ciprofloxacin

Occurrence of diseases varies with the region. The most prevalent diseases that are frequently treated in the JSS hospital were selected as key diseases and medicines that are commonly prescribed for their treatment were selected key medicines. A drug center of the hospital should have all medicines that are used to treat the key diseases. Among

the selected 38 key medicines, 36 key medicines were available on the day of inspection. Furthermore, the % availability of all key medicines was calculated and it was found that 94 % of the key medicines were available in the drug center on the day of survey.

TABLE 11: COST OF BASKET OF FOOD

Items	Unit	Retail unit cost (Rs)	Daily requirements	Cost (Rs)
Cereals	1 kg	25	520 g	13.0
Pulses	1 kg	45	25 g	1.13
Egg	1	1.50	1	1.50
Vegetables	1 kg	20	100	2.00
Root vegetables	1 kg	15	60 g	0.9
Milk	1 litre	14	300 ml	4.2
Oil	1 kg	60	45 g	2.70
Sugar	1 kg	20	35 g	0.70
Miscellaneous				5.00

Cost of Basket of Food in Retail Price = Rs. 30.87/day

Different categories of drugs that vary in their price are being used to treat one disease. The affordability of treatment of one particular disease or disorder depends upon the drugs prescribed by the prescriber. However, preliminary study should be performed to choose the cheapest drug among all available drugs for the treatment of one particular disease. With regard to this, we selected enteric fever as a disease and ciprofloxacin and ceftriaxone as basket of drugs. Between the two drugs, a study was conducted to choose the cheapest drug when compared to cost of basket of food particularly for the treatment of enteric fever. The basket of food was prepared based on daily requirements for an individual. Study indicated that ciprofloxacin is a cheaper drug compared to ceftriaxone. Average total price of treatment of enteric fever using ceftriaxone and ciprofloxacin is Rs. 915.85 and 94.70, respectively (see Table 9 and 10). However, the cost per day for ceftriaxone and ciprofloxacin is Rs. 65.4 and 13.52, respectively. Average cost of basket of food is Rs. 30.87/day (see Table 11). The cost of treatment using ceftriaxone is

2.1 fold more where as it is 2.3 fold less for ciprofloxacin when compared to the cost of basket of food.

In summary, the present study describes the assessment of availability, accessibility and affordability of medicines in a south Indian hospital. As an important criterion, essential medicines are intended to be available within the hospital at all the time in adequate amount, appropriate dosage forms with assured quality and adequate information, and at a price the individual and community can afford. Results of the present study demonstrated that, some of categories of drugs were available in excess, less and satisfactory numbers when compared to essential medicines list. However, the availability of basket of drugs was good. Affordability study of the treatment of enteric fever was performed between the drug such as ceftriaxone and ciprofloxacin, and basket of food. It was found that, the ciprofloxacin was found to be an affordable drug for the treatment of enteric fever than ceftriaxone.

## ACKNOWLEDGEMENTS

Authors thank the JSS Mahavidyapeetha for encouraging us to conduct this study. We also thank Head of the Dept. of Pharmacy Practice, JSS College of Pharmacy, Mysore and Superintendent, JSS hospital, for the support during the study.

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