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HOSPITAL PHARMACY PRACTICE IN HEALTH INSTITUTIONS OF KATHMANDU VALLEY OF NEPAL: GENERAL SCENARIO

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Abstract: Hospital pharmacy aims to contribute to health improvement and to help patients with health problems by making the best use of the medicines. Pharmacy is the last place where any patient encounters the health professionals before the starting of medication. Dispenser should be well qualified to ensure that patient/patient attendant receive all the necessary information before s/he leaves the pharmacy which is possible through good interaction between them. However besides the personnel involved in pharmacy, quality service from the pharmacy might also be affected by the location, facilities, and overall environment of the pharmacy, types and volume of prescribed drugs etc. The study aims to assess the facilities & personnel of hospital pharmacy based on National Good Pharmacy Practice guideline, and to see the dispensing practice, by analyzing the dispensing time, assessing the quality of label, the communication between dispenser and patient/patient attendant and the dispensing knowledge of the dispenser. It is a prospective study and has involved observation of the site and questionnaires (based on GPP guidelines and general) designed by the researchers to assess the aforementioned based on the response given by 68 dispensers. To assess the dispensing time, quality of label and interaction between dispenser and patient and patient attendant etc, a total of dispensing of 252 prescriptions in 19 hospitals were observed. None of pharmacies in hospital were seen to fully comply with all the selected GPP guidelines. Only 6.67% of pharmacies had separate counseling room. Majority of dispensers were found to be ignoring the importance of apron during dispensing. However Narcotic drugs were stored in lock and key system in all the hospital. Only 5.08% of pharmacy had its own compounding area. 60.29% of the dispensers were of D.Pharm qualified. 27.19% were B. Pharm graduate working as the In-charge of pharmacy. 55.93% hospital pharmacist were not under the management of hospital administration. Only 13.56% hospital had Drugs and Therapeutics Committee (DTC). The average dispensing time was found to be 90.44 seconds. None of prescriptions were adequately labeled. The results show that lots of improvement needs to be done in the dispensing practice. Similarly, the concept of GPP is still in budding stage and all the related sector should work together for proper implementation of GPP.

Keywords: Hospital Pharmacy, Good Pharmacy Practice (GPP), Health Institutions, Pharmacist, etc.

PAPER-QR CODE

INTRODUCTION

Hospital Pharmacy is the health care service, which comprises the art, practice, and profession of choosing, preparing, storing, compounding, and dispensing medicines and medical devices, advising healthcare professionals and patients on their safe, effective and efficient use. Hospital pharmacists are the pharmacists who work on the hospital setting.

The aim of pharmacy practice is defined as to "contribute to health improvement and to help patients with health problems to make the best use of their medicines".[1] There are around four major roles for pharmacist: (i) prepare, obtain, store, secure, distribute, administer, dispense and dispose of medical products; (ii) provide effective medication therapy management; (iii) maintain and improve professional performance; (iv) contribute to improve effectiveness of the health-care system and public health.[1]

For effective pharmacy practice in any setting, good pharmacy practice (GPP) is necessary. GPP is defined as "the practice of pharmacy that responds to the needs of the people who use the pharmacists' services to provide optimal, evidence-based care". [1] The purpose of good pharmacy practice guideline is to define good pharmacy practice by contemporary standards of practice and thinking; it also aims to emphasize that GPP offers a system, whereby pharmacists can provide pharmaceutical care. The conditions of practice vary widely from country to country and each national pharmaceutical organization is best able to decide what can be achieved and within what time-scale.

In context of Nepal, DDA (Department of Drug Administration) has formulated National GPP guidelines for the hospital pharmacy which is based on WHO-GPP guidelines. The main objective of GPP guideline is to ensure the patient receive the best medical therapy and to minimize the medication errors.

Nepal is a developing country and 31% people fall below poverty line.[2] Health and health care facilities are generally poor and it has directly affected livelihood of the people of Nepal. Total expenditure in health is 5.8% of GDP (2009) which accounts for billions of rupees, yet the health care system is not good. Life expectancy of people in Nepal is only 66.51 years, in some part, this may be due to lack in proper health facilities. The Physicians density is 0.21 physicians/1,000 population (2004) and Hospital bed density 5 beds/1,000 population (2006). [3] These figures reveal the poor health care provision the people of Nepal are getting.

Standards play an important role in the evaluation and accreditation. National policies and guidelines for hospitals are prepared for providing better and qualitative health facilities. Nepal Pharmacy Council had prepared Good Pharmacy Practice (GPP) guidelines in 2005 with the financial support of WHO but it has not been yet implemented by Government. Thus, amended National Health Policy should implement GPP guidelines to uplift the

status of pharmacy practice scenario in Nepal including both the community pharmacy and hospital pharmacy phase wise implantation is necessary. However, it is of utmost importance that basic requirement needs to be fulfilled by all the sectors involved in storing, selling and distributing medicines making sure that proper dispensing practice is followed.[4] The designated area for drug dispensing should have adequate space and appropriate lighting, temperature, and humidity for comfortable dispensing. Drugs should be stored in a way that facilitates the workflow, and furniture should be ergonomically distributed. Since the services provided by hospitals determine the pharmaceutical care; this research study will help to find out the degree of quality service and pharmaceutical care. For proper delivery of pharmaceutical care, it is vital that adequate dispensing practice should be implemented. Problems related to drug labeling and packaging are the second most reported category in the most medication errors.[1] Labeling of medicines greatly influence the patient compliance and improper labeling can lead to medication errors..

In Nepal, the researches related to GPP in hospital are lacking. Similarly very few researches have been done regarding dispensing practice and dispensing practice in community pharmacy and primary health care center has been the focus of such study. Lack of researches and documented study has also called for the need of studies to be conducted in the field of hospital pharmacy practice and dispensing practice. [5,6] The research include the dispensing practice and hospital pharmacy scenario based on certain criteria of national GPP guidelines.

The findings of the study, the researchers believe shall be a source of information to the respective sector such as governmental bodies, health planners, health providers, medical training institutions and other health related non-governmental organizations, about the scenario of hospital pharmacy practices in Kathmandu valley. Findings from the research can help the policy makers to make effective policies and modify the existing weaknesses and malpractices, making better the profession of hospital pharmacy in Nepal.

MATERIALS AND METHOD

Study Design & Study Population

It is a prospective study. Structured questionnaires are used for data collection. The study population consisted of the hospital pharmacies of Kathmandu valley.

Hospitals where the pharmacies has been observed: 59

- Kathmandu: 37

- Bhaktapur: 7

- Lalitpur: 14

Data collection tools

Two sets of structured Questionnaires were used for data collection.

The first set consisted of questionnaire related to hospital pharmacy and it included:

- Questionnaire related to facilities of pharmacy based on National GPP guideline

- Questionnaire related to personnel working in pharmacy based on National GPP guideline

- Miscellaneous questionnaire related to pharmacy administration

The second set consisted of questionnaire related to dispensing practice which included:

- Questionnaire related to the dispensing time and labeling parameters

- Questionnaire related to the patient/patient attendant and dispenser interaction

- Questionnaire to assess the dispensing knowledge of the dispenser. It also include gender, experience and qualification of dispenser.

Process

A request letter for the permission to conduct the study given by department of Pharmacy, Kathmandu University was handed over to the Pharmacy In-charge or Hospital Administrator as required. The objectives of the research were explained. After getting the permission to conduct research, the dispensers assigned by owner or In-charge were requested to fill the questionnaire related to dispensing knowledge. In mean time the other assigned staffs were interviewed for filling the other questionnaires. The premises were observed by the researcher for the presence of facilities regarding various parameters. Similarly, data was collected for labeling parameter, dispensing time and interaction parameter.

For dispensing time observation, the stop watch was sets as soon as the dispenser dispenses a prescription. It included the time of labeling, and dispenser – patient /patient attendant interaction. Hence time taken by dispenser to take out the medicine and conversation amongst the staff during dispensing was excluded.

Data analysis

The data were coded and entered in a computer using Excel. The results were calculated in percentage. Descriptive analyses were conducted for majority of the parameters. However to find the relation between the dispenser's correct answer and the job experience (month) the correlation analysis was done using MINITAB 14.

RESULTS AND DISCUSSION

1. Facilities

Facilities refer to those infrastructures that facilitate the patients attending the pharmacy. To ensure optimal operational performance and quality patient care, adequate space, equipment, and supplies needs to be available for all professional and administrative functions relating to medication use. These resources must be located in areas that facilitate the provision of services to patients, nurses, prescribers and other health care providers and must be integrated with the hospital's communication and delivery or transportation systems. Facilities shall be constructed, arranged, and equipped to promote safe and efficient work and to avoid deterioration of drug products [7]. Table below is the result of the study done on the facilities parameters of the hospital of the Kathmandu Valley.

Table 1: Facilities of Pharmacy

S.No.	Facilities Parameter	No. of hospital	Percentage (%)
1.	Hospitals with façade the word "PHARMACY" both in Nepali & English	42	71.18
2.	Hospitals with façade the word "PHARMACY" in Nepali only	6	10.17
3.	Hospitals with façade the word "PHARMACY" in English only	4	6.78
4.	Hospitals with no façade the word "PHARMACY"	7	11.86
5.	Pharmacy with neat & clean environment	52	88.13
6.	Pharmacy that protected the medicine from heat & light	59	100
7.	Pharmacy equipped with refrigerators	58	98.30
8.	Pharmacy with computer software (billing)	48	81.35
9.	Pharmacy accessible to people using prams & wheel chairs	48	81.35
10.	Pharmacy with Separate Counseling room	4	6.78
11.	Pharmacy that kept the prescription medicine out of reach of patient	51	86.44
12.	Pharmacy with separate quarantine area for all incoming drugs	39	66.10
13.	Pharmacy that kept "NARCOTIC DRUGS" in Lock & key system.	59	100
14.	Pharmacy with separate compounding room	3	5.08
15.	Pharmacy with the thermometer to record to record room temperature	13	22.03

Proper location and layout are both vital for any service oriented enterprises. Pharmacy being one of these enterprises should in general be easily accessible and located. National Good Pharmacy Practice Guidelines have emphasized the need for a façade displaying the word 'PHARMACY' in both English and Nepali language. [8] Out of 59 hospital pharmacy surveyed, 42 fulfilled the requirement. 7 hospitals did not bother to put the word. They should have to be written in both English and Nepali so that the person who are a bit literate can also locate their location and know where it is. The survey was done in 59 hospitals and among them only 42 hospitals have, 6 hospitals contain name written in English only and 4 hospitals contain name written in Nepali only. One basic principle of good pharmacy guidelines is name as well.

The area around the pharmacy should be neat and clean. Free from dust, well managed drugs and medicaments, clean floor of the pharmacy etc. were the criteria used by researcher to determine the neat and clean pharmacy. In an observation done in 59 hospitals, 52 hospitals met the criteria for neat and clean pharmacy determined by researcher.

The storage of the narcotics and other drugs should be proper. They should be kept in lock and key system [8]. For some drugs, there should be provision of refrigeration for the storage of drugs to maintain their stability. Out of 59 hospitals, all the hospitals had good provision of storage of narcotics and other drugs with refrigerator. The result is good regarding the storage facility in term of national GPP. But, majority of hospitals were not facilitated with the thermometer to measure the temperature of the room. Only 13 out of 59 hospitals were facilitated with the thermometer. Since the survey was done in Kathmandu Valley where the temperature is moderate for the storage of medicine at room temperature, the requirement of thermometer as a facility infrastructure was considered to be minor.

Computerized system can be used for inventory management billing etc. in pharmacy. Well equipped computerized system can provide the services in effective way. On survey, out of 59 hospitals, 48 hospitals had computer facility. But this computer facility was just for the billing and inventory management of the pharmacy.

The ability to prescribe drugs rationally is influenced by many features of the working environment [9]. Separate counseling room is one of the facilities. Separate counseling room in pharmacy makes the effective communication between the pharmacist and the patient. It is also the integral part of the pharmacy facility but on the survey, out of 59 hospitals, only 4 hospitals had the separate counseling room. Separate counseling service is the slowly evolving part of hospital pharmacy in Nepal. The research shows that counseling is done along with dispensing.

Compounding is also the one of the very important section, a hospital pharmacy could incorporate. But only 3 out of 59 hospitals had a separate compounding facility. The reason behind this might be due to commercially availability of different dosage forms which are in ready to administer form providing the better patient compliance.

2. **Personnel**

2.1 Assessment of knowledge of dispenser

Dispensers are the last person whom patient encounter before leaving the hospital. So they have an important role in making patient understand how to use and how long to use the medicines. The following table shows the result of the questionnaire to assess the knowledge of dispenser.

Table no 2: Assessment of knowledge of dispenser

S.No.	Questions	Total correct answers	Percentage (%)
1.	Which of the following drugs are to be store in Refrigerator? a. insulin vial b. eye drop c. **normal saline** d. antacid suspensions	68	100
2.	Which of the following is the OTC drug? a. amoxicillin b. **paracetamol** c. Phenytoin d. enalapril	64	94.11
3.	What does H.S. means? a. at morning b. **at bed time** c. when needed d. take after food	68	100
4.	Drug that shouldn't be dispensed without prescription? a. Ibuprofen b. **amoldipine** c. Ranitidine d. all of adove e. don't know	60	88.23
5.	How Sustained released tablet can be taken? a. **as whole** b. by breaking c. by dissolving d. none of the above e. don't know	49	72.06
6.	How dispersible tablets are taken? a. as whole b. by chewing	56	82.36

#			
	c. **by dissolving in water** d. none of the above e. don't know		
7.	What instruction should be given to patient or patient attendant while dispensing? a. Dosage b. Frequency c. Side effect d. Drugs effect e. **all of the above** f. don't know	54	74.21
8.	Medicine shouldn't be dispensed when: a.Change in colour b. breaking c.Chipping d. change in color e. **all of the above** f. don't know	57	83.82
9.	What is the child dose (5-8) yrs of paracetamol? a. 250 mg b. 100 mg c. (10-15) mg per kg d. **(5-8) mg per kg** e.don't know	5	7.35
10.	What do you understand by FIFO? a. **First In First Out** b. First In Last Out c. Randomly d. Other (specify) e.don't know	60	88.23
11.	What do you understand by cool place? a. (0-8) ^{0}c b. **(8-15) ^{0}c** c. (25-40) ^{0}c d. more than 40 ^{0}c e. don't know	41	60.29

Out of 11 questions, 9 right answers were made by highest number of dispenser. Out of 68 dispensers only 1 dispenser gave correct answer to all questions. A minimum of 4 right answers was made by 1 dispenser. Dispensers need to be updated with current trend of dispensing and counseling, which seems to be lacking in them who gave correct answer to few questions only.

Out of 68 respondents, 100% responded correctly on the question of use of refrigerator and meaning of H.S. 94.12% of respondents knew the drug among the option that belong to OTC. 88.24% of respondents knew the meaning of FIFO and knew the drug among the option that belongs to POM. 72.06% and 82.35% of respondents possessed knowledge about sustained release tablet and dispersible tablet respectively. 79.41% and 83.82% of respondents had correct idea of instruction to be given while dispensing and

knowledge about the medicine not suitable for dispensing respectively. Only 7.35% of respondents knew how to calculate child dose of paracetamol tablet for children.

Result is good in term of use of refrigerator and meaning of abbreviation. 100% of the dispenser should have possessed knowledge about OTC, sustain release tablet, dispersible tablet. These are the daily issues that are being encountered by the pharmacist while dispensing medicine. OTC drugs are the drugs that can be given by pharmacist or pharmacy assistant or health professional or other on the direct supervision of Pharmacist [10]. Lack of this knowledge can result in misuse of drug. Sustained release dosage forms are designed to release a drug at a predetermined rate in order to maintain a constant drug concentration for a specific period of time with minimum side effects [10]. These drug should be taken as a whole i.e.; should never break before taking drug otherwise it won't give its sustain release property. Dispersible tablets are uncoated or film-coated tablets that can be dispersed in liquid before administration giving a homogenous dispersion. Dispersible tablets usually disintegrate within three minutes when put in water or a small amount of breast milk [11]. Main purpose of dispersible tablet is quick release of dosage form for rapid therapeutic effect taking of dispersible tablet as a whole can result delay in therapeutic effect.

2.2 Correlation between dispenser's knowledge with their experience.

The Pearson correlation coefficient obtained to analyze the correlation between total correct answer of each dispenser and their respective experience comes was -0.096 (p-value = 0.4888, n= 54). The analysis did not reveal any significant correlation between the knowledge of dispenser and the length of the time they have been in the profession. Thus test shows that knowledge is not dependent on the experience of the dispensers. There might be many reasons for this. One may be the lack of continuing education amongst dispenser who has been working since many years.

Similar result was obtained in one research conduct in community pharmacy of Kathmandu [6].

2.3 Qualification of dispenser

Table no. 3: Qualification of dispenser

S.N	Qualification	Number of dispenser	Percentage(N=68)
1	B. Pharm	9	13.24
2	D. Pharm	41	60.29
3	C.M.A	8	11.76
4	H.A	1	1.47

5	A.N.M	1	1.47
6	Orientation	7	10.29
7	Other	1	1.47

Other studies done in Nepal has shown that more number of dispenser have qualification of CMA (24.03%) in compare to D. Pharm which accounts for only 20.19% [1]. Our study also shows that prevalence of dispenser with qualification of D. Pharm is high in hospital pharmacy as well. Hospital pharmacies have 13.24% B. Pharm graduates. In one of the survey done in Nepal there were no B. Pharm graduates in community pharmacy [6]. Study showed 73.53% were from pharmacy profession (B. Pharm and D. Pharm) which was better than the previous study done. [6]. But for optimum patient care and rational drug therapy, it would be better to have 100% of dispenser from pharmacy profession.

B. Pharm graduates are being produced in Nepal since 1994 (KU). So the involvement of B. Pharm graduates in pharmacy practice might have been increased compared to studies done earlier. Increase in number of dispenser with knowledge of pharmacy practice in future can be expected.

2. 4. Qualification of In-charge of Pharmacy

In-charge of pharmacy are head of pharmacy, look after all activities of pharmacy. Effective leadership and practice management skills are necessary for the delivery of pharmaceutical services in a manner consistent with the hospitals' and patients' needs as well as continuous improvement in patient care outcomes[7]. Pharmaceutical service management must focus on the pharmacist's responsibility to provide pharmaceutical care and to develop an organizational structure to support that mission.

Given below is the qualification of In-charge of pharmacy:

Table no. 4: Qualification of In-charge of Pharmacy

S.N	Qualification	Number of dispenser	Percentage(N=68)
1	Pharm D	1	1.78
2	M. Pharm	3	5.35
3	B. Pharm	16	27.19
4	Diploma	13	23.21
5	H.A.	1	1.78
6	C.M.A	5	8.93

7	Orientation	4	7.14
8	BSc. Nursing	1	1.78
9	MBA	3	5.53
10	BA	3	5.53
11	Others	6	10.71

From three hospitals, data was not available

It seems that in most of the hospitals, own medical staff are the owner of pharmacy. It would be better if In-charge post was hold by B. Pharm or M. Pharm or Pharm D who were expert on drug, possess knowledge on pharmaceutical care, pharmacology, toxicology, medicinal organic chemistry and other allied pharmaceutics for rational drug therapy and optimum patient care. The director of the pharmacy service must be thoroughly knowledgeable about hospital pharmacy practice and management. He or she should have completed a pharmacy residency program accredited by the American Society of Health-System Pharmacists. An advanced management degree (e.g., M.B.A., M.H.A., and M.S.) is desirable [7].

2.5 Qualification of working staff

Sufficient support personnel (pharmacy technicians, clerical, secretarial) shall be employed to facilitate the implementation of pharmaceutical care[7]. The qualification posses by them are important to run the pharmacy properly. The table below is the result of study done on the number of personnel with different qualification.

Table no: 5: Qualification of working staff

S.N.	Personnel	Total	Percentage (N=529)
1	B. Pharm and above	50	9.45
2	Diploma	185	34.97
3	C.M.A	65	12.29
4	A.N.M	4	0.75
5	H.A	12	2.27
6	Others	177	34.36

Out of 529 personnel, majority were found to be with Diploma degree with a number of 185 that is 34.97%. 50 personnel were with B. Pharm degree. Personnel with degree of A.N.M & H.A were found to be in less number. C.M.A degree holder personnel were

found to be in considerable number that is 65. Personnel with other than pharmacy degree were also found to be more in number i.e. 177 that is 34.36%. These personnel were from non-pharmacy field.

Both personnel from medical background and non-medical background should be there. Personnel with medical background can go with dealing with the patients while the personnel from non medical background can act as supportive personnel to manage other part of the pharmacy like billing, store management etc to run the pharmacy properly. We also can conclude that diploma in pharmacy were given more priority than B.Pharm degree. This may be due to cost factor.

But from this data we can also come across the conclusion that personnel with core pharmacy degree were found relatively less in number than other profession, unrelated to pharmacy. Hospital pharmacy is the basic area where pharmacy professional can be utilized, but this seems to be quite low with respect to the data obtained here.

3. **Miscellaneous**

Table no 6: Miscellaneous

Sr. No.	Facilities Parameter	No. of hospital	Percentage (%)
1	Pharmacy not operated by Hospital Management	33	55.93
2	Pharmacy operated by Hospital Management	25	42.37
3	Semi government	1	1.69
4	Hospital with DTC	8	13.56
5	Hospital select drugs as per the DTC	5	8.47
6	Hospitals that follow the formulary system	9	15.25
7	Hospitals with essential drug list	40	67.80
8	Hospitals that follow individual	50	84.75
9	Hospitals that follow individual drug	2	3.39
10	Hospitals that follow individual drug	4	6.78
11	Hospitals that follow unit drug	1	1.69
12	Hospitals that follow unit dose drug	2	3.39

Semi Government: Hospital Pharmacy, where about half of medicine is funded by Government and rest are purchased by pharmacy itself (source: Hospital)

According to this survey, only 42.37% of Hospital Pharmacy is run by Hospitals. This showed poor Hospital pharmacy management under hospital itself which cannot afford efficient and effective co-ordination & communication between the staffs and patient. Only 13.56% of Hospitals have DTC which pointed out the lack of drug policies and procedures which helps to ensure safe and cost effective therapy. So, hospitals are poor in the leadership and structure needed to select appropriate drugs for the formulary, causes irrational drug use, and increase waste, thereby increasing drug expenditures and patient outcome is poor. Maximum number of hospitals keeps essential drug lists (67.80%).

 Hospitals that follow formulary system are only 15.25%. The formulary is a continually revised compilation of pharmaceuticals (plus important ancillary information) that reflects the current clinical judgment of the medical staff. This showed that hospitals have not been using updated list of medications and related information, representing the clinical judgment of physicians, pharmacists, and other experts in the diagnosis, prophylaxis, or treatment of disease and promotion of health [7]. About 84.75% of Hospitals follows individual drug delivery system which indicates overload for patient and lack of modern managed delivery system. It is an emerging drug delivery system which is affordable to Hospital. By use of this method, Inventory is reduced in the nursing unit and the drug prescription of each Patient gets addressed (But usually, delays are experienced between drug ordering and having them dispensed and cause medication errors. Though Unit dose distribution system is safer for the patients as chances of medication errors are low and is more efficient and economical for organization, hospitals using this method are only 3.39% [12]. This clarify that there is less efficient usage of pharmacy and nursing personnel, showing less direct patient-care involvement by pharmacists and nurses. There are only 1.69% of hospitals which follows unit drug delivery and floor stock drug distribution system both. The lack of floor Stock is deficient of prompt and easy accessibility of medicines by the nurses [1].

4.   Labeling Parameter

Labeling ensures all the basic considerations to be followed by the Patient are written well on the container or envelop. It is considered if a dispenser writes the required basic information on the strip itself or on the envelope. But for complete labeling all the parameters of label i.e. name of the patient, name of the drug, strength, frequency, duration, volume, date of dispensing has to be mentioned. It signifies a written communication about the related medication so that patient would understand the instructions.

Table no 7. Labeling Parameter

Sr. No.	Components	No. of Drug	Percentage (%)
1	Instruction written in container itself	413	70.12
2	Instruction Written in envelope	58	9.85
3	Patient name	0	0
4	Drug name	0	0
5	Strength	0	0
6	Dosage Form	0	0
7	Quality of the Medicine	0	0
8	Frequency	393	66.67

In 70.12 % of encountered hospital pharmacy, labeling was done on container itself. This is usually practiced in hospital to minimize the cost and it also encourages the patient in being specific to his/her medication according to the label on it. In 9.85% of encounter, labeling was done on envelope. This practice prevents inter mixing of the drugs with other drugs which may lead to poor patient compliance. There was no label in 20% encountered hospital pharmacy. This may be due to carelessness of hospital pharmacy or for the follow up patient or high-tech patient. Of the total encounter, 66.67% contains frequency parameter in label. This is not adequate because frequency is most important parameter of labeling on which rational use of medicine relies. The research study done in Nepal by INRUD Nepal shows that labeling was not found for any drug [5]. Another related study done in Laos and Malawi showed that 67% and 25.4% of encounters were adequately labeled [13, 14].

5. **Interaction between Patient/Patient attendant & Dispenser**

The interaction parameter determines the quality of care [9]. It is good practice to make the patient leave the pharmacy after ensuring that the patient/patient attendant have understood basic things (when to take, how to take, how long to take, what drug does,

precaution, side effect) about his/her medication. Since the pharmacy is the last department that patient/patient party will encounter to, it's the responsibility of dispenser to give adequate information.

Table no. 8: Interaction between Patient/Patient attendant & Dispenser

S.N.	Interaction Parameter	Total Numbers	Percentage (%)
1	How to take medicine	372	59.73
2	What drug do	30	5.09
3	When to take	548	93
4	For how long	75	12.73
5	Precaution	9	1.5
6	Possible side effect	2	0.03

N=589

In total of 252 prescriptions encountered, there were 589 medicines. Direction on how to use medicine was given for 59.73%, information about what drug do was given for 5.09%, information on when to take was given for 93%, information on how long to take was given for 12.73%. Information regarding precaution was given for 1.5% and only for 0.03% encounter dispenser make patient/patient attendant aware of the possible side effect. In none of the encounter patient/patient attendant were counseled with all the interaction parameters of our study. Most of the interaction was focused on medicine taking time (93%) and method of taking (59.73%). Very few interactions were made on precaution (1.5%) and possible side effect (0.03%).

The interaction parameters are crucial factor for the effective use of medicine and for the success of therapy. Our study shows that dispensers are not giving complete information about use of drug and its consequences. Failure of therapy will occur if drug is not administered from prescribed route, if drug is not used for proper duration at proper time. In some cases patient quit to take drug because of side effect experienced. Some may not know what drug does, so they quit taking drug. Patients may experience serious effects if precaution is not taken. So, there is greater chance of treatment failure due to inadequate interaction.

Interaction on the parameters: how to take and when to take medicine is good (59.73% and 93% respectively). But the interaction in other parameters is less. These inadequate interactions may have been occurred because of the involvement of that dispenser who has not come from medical field (11.66%). Qualification and knowledge of dispensers may be the factors responsible for inadequate interaction.

6.   Dispensing time and average drug per prescription

The average dispensing time measure the average time of those personnel dispensing drugs spend with patients. Average dispensing time is one of the important patient care indicators. The time that dispensers spend with each patient sets important limits on the potential quality of diagnosis and treatment. Patients for whom pharmaceuticals are prescribed should, at a minimum, receive well-labeled medications, and should understand how to take each drug [9].

According to our research, average dispensing time was found to be 90.44 second which is slightly low compared to research related to interventional analysis 95.95 seconds [6]. However the dispensing time is higher than 58.4 second than in Malawi [15]. Its indicate that there is not qualitative interaction between dispenser and patient/patient attendant. Similarly the highest dispensing time was recorded 273 second and the lowest average dispensing time was 27.82 second. The factors such as number of medicine per prescription, type of drug, nature of administration of drug may also affects the dispensing time. Hence, these factors may be the cause for such a great difference between lowest and highest dispensing time.

Out of 59 hospitals, only from 19 hospitals, the dispensing time & average drugs per prescription was found to be 2.47. This is due to the inappropriate time of O.D.P hours of various hospitals to conduct the proper study on concerned title.

CONCLUSION

The research was done in Kathmandu valley of Nepal. It has covered 59 hospitals of Kathmandu valley and research was done specifically in the pharmacy of hospital. No specific sampling technique was followed to select the hospitals. It was selected as convenient to the researchers. Research study was done in pharmacy of government hospital, private hospital, semi government hospital and community hospitals.

Parameters regarding facility of hospital pharmacy, personnel were observed in study. Miscellaneous parameters of hospital pharmacy like ownership of pharmacy, presence of DTC, availability of essential drug list and formulary, type of in-patient drug delivery system, apron worn by pharmacy personnel were observed. The crucial factors of

dispensing: interaction between dispenser and patient/patient attendant and labeling parameters were observed. Dispensing time was also observed.

Most of the hospitals (71.18%) contain the word Pharmacy (in both English and Nepali) in their façade. 11.46% of hospitals have no façade. Medicines were stored under proper conditions (protected from heat and light, refrigerated) in almost all hospital. 81.35% pharmacy was accessible for using wheel chair and prams. Just 6.67% of pharmacies have separate counseling room. Narcotic drugs were stored in lock and key system in all the hospital. 5.08% of pharmacy had its own compounding area.

Out of 11 questions designed to access knowledge of dispenser, most of the dispenser gave correct answer for 9 questions. The minimum number of correct answer was 4 and was given by 1 out of 58 dispensers. The maximum number of right answer was 11 and was given by 1 out of 58 dispensers. The research shows that there is no correlation between experience and knowledge of dispenser.

Most of the dispensers have qualification of D. Pharm (60.29%). Few dispensers were not from the medical field (1.4%). Hospital pharmacies have 13.24% B. Pharm graduates.

Most of the hospitals (27.19%) have B. Pharm graduate as the In-charge of pharmacy. Pharmacy In-charge with qualification of Pharm D, B. Sc nurse and H.A. was 1.78%. Presence of the personnel with qualification of D. Pharm as pharmacy In-charge was 23.21%.

Most of the personnel (34.97%) working in pharmacy have qualification of D. pharm. Very few A.N.M. (0.75%) were working in pharmacy. Only 9.45% B. Pharm graduates were found to be working in pharmacy. Significant numbers of staffs (34.36%) dispensers were from the field other than medical area.

In an observation done in 252 prescriptions, the average dispensing time was found to be 90.44 second, with maximum dispensing time of 273.83 second and minimum dispensing time of 27.8 second. The average number of drug per prescription was found to be 2.47

In total of 252 prescriptions encountered, there were 589 medicines. Direction on how to use medicine was given for 59.73%, information about what drug do was given for 5.09%, information on when to take was given for 93%, information on how long to take was given for 12.73%. Information regarding precaution was given for 1.5% and only for 0.03% encounter dispenser make patient/patient attendant aware of the possible side effect. In none of the encounter patient/patient attendant were counseled with all the interaction parameters of our study. Most of the interaction was focused on medicine

taking time (93%) and method of taking (59.73%). Very few interactions were made on precaution (1.5%) and possible side effect (0.03%).

In 70.12% encounters labeling was done in the container itself and in 9.85% labeling was done in envelope. In 66.67% encounter it was labeled with frequency of taking drug. None of the medicine was labeled with patient's name, drug name, dosage form, strength and quantity of medicine.

42.37% pharmacy are owned by hospital itself and 55.93% hospitals were private. 13.56% of hospitals have DTC. 84.75% of the hospitals follow individual drug distribution system and 8.47% hospital follow unit dose dispensing system of drug distribution in combination with other system.

The practice of storing drug is good and is as per the national GPP guideline. Though DTC is crucial part of hospital pharmacy, it is not found in all the hospital, only 13.56% have it. Very few dispensers are from non-medical field (1.47%), but it would have been better if every dispenser were from the medical field. The presence of qualified personnel in dispensing is satisfactory. The content of interaction between patient/patient attendant and dispenser lacks many parameters and same is the condition in labeling also.

Since the National GPP guidelines are only formed in draft, the result indicate that the implementation is in very initial phase. Hence the condition of pharmacy practice is not so awful and in comparing it against the researches done earlier, the condition is improving slowly in term of qualification of dispenser, dispensing time, labeling.

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ANNEX

LIST OF ABBREVIATION

A.N.M	Auxiliary Nurse Midwife
ASHP	American Society of Health-System Pharmacists
BA	Bachelor in Art
B. Pharm	Bachelor in Pharmacy
C.M.A	Community Medical Assistance
DDA	Department of Drug Administration
DTC	Drug and Therapeutics Committee
D. Pharm	Diploma in Pharmacy
FIFO	First In First Out
GPP	Good Pharmacy Practice
H.A	Health Assistance
H.S	at bed time
MBA	Master in Business Administration
M. Pharm	Master in Pharmacy
NPC	Nepal Pharmacy Council
OTC	Over The Counter
POM	Prescription Only Medicine
WHO	World Health Organization
INRDU	International Network for Rational Drug Use