



Role of Pharmacist in Addressing the Adverse Drug Reactions and Improving the Knowledge of Patients Regarding Their Drug Therapy at Government Civil Hospital Khairpur, Sindh, Pakistan

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Authors' contributions

This work was carried out in collaboration among all authors. Author ZA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MM, Sajid Ali, Shahzad Ali and AA managed the analyses of the study. Authors HK, TA, Sabit Ali, JA and SSASR managed the analyses of the study and literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i631194

Editor(s):

(1) Dr. Sachin Kumar Jain, IPS Academy College of Pharmacy, India.

Reviewers:

(1) Shreyas Pendharkar, Govt. Medical College, Akola, India.

(2) Emmanuel M. Baah, Takoradi Technical University, Ghana.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/65775>

Original Research Article

Received 12 December 2020

Accepted 17 February 2021

Published 03 March 2021

ABSTRACT

Adverse Drug Reactions are among the major problems that cause mortality and morbidity in patients worldwide. In this study, Adverse Drug Reactions with common medicines were addressed, and the knowledge of pharmacist for prescribed medicine was also evaluated before and after educating the patients by pharmacist. The duration of this study was one year from

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October 2016 to October 2017. A descriptive cross-sectional study was designed and completed on 150 patients admitted to the hospital's medical ward. Patients whose ages were between 18-60 years, either male or female, who reported chronic diseases and took medication for a long time were selected for the study. Children or patients having < 18 years and taking medicine for a short period were excluded from this study. Selected patients were evaluated, and results were collected. Finally, the collected data was analysed with the 21st version of IBM's Statistical Package for Service Solutions (SPSS v23). Of 150 selected patients, 61% were male, and 39% were female. Most patients were from the 18-30 age group, i.e., 28%. 60% of the patients hail from rural areas, and 40% from an urban areas. Of the 150 patient studied, 36.7% were illiterate, and only 4.7% of patients were above intermediate. Most of the patients were working in different government and private sectors. 8% of those taking the combination of Amoxicillin+Omeprazole+Salbutamol reported side-effects, whereas minimum side effects (2.0%) with Cholorothiazide+Atenolol+Paracetamol. Reported adverse drug reactions (ADRs) in patients were Headache (14.9%), nausea (13.8%), vomiting (10.3%), abdominal pain (12.6%), constipation (8.0%), diarrhea (10.3%), skin rashes (5.7%), loss of appetite (4.6%), dizziness (6.9%), tiredness (6.9%) and confusion (5.7%). The knowledge of patients regarding therapy was compared before and after counseling that shows increased awareness in patients after counseling the patients. Before counseling average knowledge of patients was 27.5% that increased to 50.3% after counseling. After analyzing the results, it is concluded that pharmacist counseling and providing education to patients can significantly decrease the ADRs and increase the compliance of drugs that will ultimately enhance patients' quality of life. It was recommended that the hospital should appoint the pharmacist, especially a clinical pharmacist, and Hospital administration should arrange the programs for the awareness of patients on appropriate uses of drugs and their side effects.

Keywords: Health care system; adverse drug reactions; drug-drug interactions; drug-food interactions; drug therapy; pharmacist.

1. INTRODUCTION

Adverse Drug Reactions are among the major problems that cause mortality and morbidity in patients worldwide [1]. One of the essential healthcare process issues is identifying, preventing, and resolving Drug Related Problems (DRPs). A drug-related issue (DRPs) is characterized as 'an occasion or condition, including drug treatment that really or possibly interferes with wanted outcomes [2]. Drug-related problems are categorized into three groups Patient-related potential Drug-related problems: e.g., Non-compliance. Prescriber - related potential Drug-related problems: e.g., No existing indications, same therapeutic effects, improper dosage (Over and under dosage), and improper use. Drug-related potential Drug-related problems: e.g., Contraindication, Drug-drug interaction, adverse drug reactions treatment [3]. Factors involved in Adverse Drug Reactions are the pressure of patients on the prescriber. Health care system. Marketing tacts. Administration error interaction between two drugs, interaction of disease with drug and Drug-food interactions [4], is essential for pharmacists to provide medication information to the patients. That information can either be related to the patient, as an essential part of pharmaceutical care, or

related to the group of patients [5]. Education provided to the patient through counseling has critical importance. By giving education to the patient, the physician may be satisfied that his patient is well educated and will positively impact patient therapy. Pharmacist take advantage of an increased relationship with his educated patients [6]. Patient education program helps the patient to better cop up with the chronic disease [7]. It has been seen that for some ailment, patients are re-admitted to the medical hospitals. The improved patient education process is an essential way for medical hospitals to lessen readmission rates [8].

2. METHODOLOGY

A descriptive cross-sectional study was conducted at a government civil hospital, Khairpur; 150 patients were enrolled via non-probability purposive sampling method from medical wards. The research duration was 12 months, from 20-10-2016 to 20-10-2017. Data was collected by administering a well structured questionnaire. For assessment of ADRs, only those ADRs which were reported by the patients were considered. For patient education assessment, a list of 10 questions was prepared. Patients were asked the same questions pre and

post counseling to assess patients' level of knowledge related to their drug therapy. Data was analysed using IBM's Statistical Package for Service Solutions (SPSS v23).

2.1 Inclusive Criteria

All the patients admitted to the medical ward for at least three days were included in the study. All those patients who had complete medical records were included. All Patients between the age of 18-65 years were included. Both males and females were included in the study.

2.2 Exclusive Criteria

Patients whose age was less than 18 years, and more than 65 years were excluded. Patients with incomplete medical records were omitted

3. RESULTS

In this study, 150 patients were selected and evaluated through the non-probability purposive method. Demographic parameters of the study are discussed in Table 1.

In this study, male and female were selected, (60.7%) were male and (39.3%) were female, and 42 patients (28%) were from age group 18-30, 38 patients (25.3%) from 31-40, 40 patients (26.7%) from 41-50, and 30 patients (20%) were from 51-60 age group. Education rate in this study was as follows: 55 patients (36.7%) were illiterate, 37 patients (24.7%) had completed at most primary school, 33 patients (22%) were matric passed, 18 patients (12%) were inter

passed, and only seven patients (4.7%) were university or tertiary level graduates. Out of 150 patients, 86 (57.3%) were employed, and 64 (42.7%) were unemployed.

The patients were suffering from different chronic diseases. These diseases include; Heart disease in 19 patients (12.7%), Respiratory illness in 34 patients (22.7%), Diabetes mellitus in 31 patients (20.7%), Hepatitis in 17 patients (11.3%), Rheumatoid arthritis in 11 patients (7.3%), Ulcer in 16 patients (10.7%), Urinary tract infection in 13 patients (8.7%) and Epilepsy in 9 patients (6.0%) as shown in Table 2.

Table 3 shows side effects reported by the patients, 87 patients out of 150 (58.0%) reported the side effects of drugs. These patients were using different drugs in a different combination, responsible for side effects in patients. The pharmacist asks various patients' questions to check their knowledge regarding their prescribed medicine before and after counseling. Before counseling, the average knowledge of patients was 27.5% that increased up to 50.13% after counseling, as shown in Table 4.

4. DISCUSSION

A clinical Pharmacist is a person who is responsible for providing drug-related information to the patient in each hospital. His role starts from the admission of the patient till his discharge. The pharmacist will take the complete medical and drug history of patients.

Table 1. Demographic characteristics of patients

	Variable	Frequency	Percentage
Gender	Male	91	60.7%
	Female	59	39.0%
Age group	18-30	42	28.0%
	31-40	38	25.3%
	41-50	40	26.7%
	51-60	30	20.0%
Locality	Urban	90	60.0%
	Rural	60	40.0%
Education	Illiterate	55	36.7%
	Primary	37	24.7%
	Secondary	33	22.0%
	Higher-Secondary	18	12.0%
	Bachelors/Masters	7	4.7%
Occupation	Employed	86	57.3
	Un-employed	64	42.7

Table 2. Disease wise distribution of patients

S. No	Chronic disease	Frequency	Percentages
1	Cardiovascular disease	19	12.7%
2	Respiratory illness	34	22.7%
3	Diabetes mellitus	31	20.7%
4	Hepatitis	17	11.3%
5	Rheumatoid arthritis	11	7.3%
6	Ulcer	16	10.7%
7	Urinary tract infection	13	8.7%
8	Epilepsy	9	6.0%
9	Total	100	100%

After evaluating the diagnosis of patients based on clinical reports and physician's evaluation, the pharmaceutical care plan will be set for each patient, the prescription should be reviewed and DRPs, ADRs will be identified and solved, patients will be counseled daily about their diseases and drugs appropriate use and ADRs of drugs, and finally at the time of discharge pharmacist will counsel about appropriate usage of the drug in their homes.

In this study, 60.2% of patients were male, which is greater than the number of female (39.0%) patients. Most of the patients were in the age groups 18-30 (42.0%) and 41-50 (40.0%). The literacy rate in patients was meager, 55.0% of patients were illiterate, and only 7.0% were tertiary level graduates or had higher education. A similar type of study by Al-Azzam, S.I. et al. [9] focused on identifying DRPs and preventing them in out-patients of Jordan hospital to improve patients' quality of life. 59.5% of patients were female greater than male (40.1%) patients [9]. In Chua et al. [10] study, the study focused on the pharmacist role in identifying and preventing DRPs and found that it was 60.2% greater than females (39.8%). In our study patients were suffering from different chronic diseases like Cardio vascular disease in 19 (12.7%), respiratory illness in 34 (22.7%), diabetes mellitus in 31 (20.7%), hepatitis in 17 (11.3%), rheumatoid arthritis in 11 (7.3%), ulcer in 16 (10.7%), urinary tract infection (UTI) in 13 (8.7%), and epilepsy in 9 (6.0%) patients, whereas in similar study of Al- Azzam et al. [9] patients were suffering from hypertension 2,146 (74.1%), diabetes mellitus 1,510 (52.2%), dyslipidemia 1,100 (38.0%), ische-mic heart disease 846 (29.2%), cardiac catheterization 801 (27.6%), asthma 608 (21.0%), heart failure 261 (9.0%), cholecystec-tomy 248 (8.6%), hypothyroidism 178 (6.1%), gout 144 (5.0%),

chronic obstruct-tive pulmonary disease 117 (4.0%), renal impairment 101 (3.5%), coronary artery bypass graft 76 (2.6%), and rheumatoid arthritis in 64 (2.2%) patients. In Chua et al. [10] study, patients were selected who were suffering from diabetes mellitus (DM) 45 (9.4%), hypertension (HTN) 79 (16.6%), hyperlipidemia (HLP) 42 (8.8%), DM with HTN 54 (11.3%), DM with HLP 70 (14.7%), HTN with HLP 88 (18.4%),and DM with HTN and HLP 99 (20.8%) [10].

Vinks TH. et al. [11] research also focus the elder group of patients, age-associated DRPs, and active role of community pharmacist by providing education. In this study, 27% of selected patients were male, and 73% were female, whereas, in this study, both male and female were in equal ratio, 50% were male, and 50% were female. In this study, 763 different types of DRPs were reported by patients, whereas in this study, patients were not aware of DRPs, ADRs of drugs, and how to report them, so only 79 different types of DRPs were reported by patients. Mostly, patients from rural areas didn't report any physicians' problems; these problems were identified when the pharmacist counseled them and asked them about any unusual drug response. In this study, drug-drug interaction was observed in 17.8% of patients. In contrast, in this study, patients' same unawareness was observed, and only 5.3% of patients were aware of drug-drug interaction. They tell the pharmacist during counseling [11].

Lindenmeyer, A. et al. [12] research the pharmacist role in providing knowledge and guidance to DM-II patients. Results show a clear improvement in the management of DM after counseling the patients [12] similarly; in this study, results clearly show the increase in knowledge of patients after proper counseling

Table 3. Medicines causing side effects reported by patients

Medicines	Frequency	Percent	Valid Percent	Cumulative Percent
Amoxicillin+Omeprazole+Salbutamol	7	8.0%	8.0	8.0
Ibuprofen+ Nifedipine	4	4.6%	4.6	12.6
Montelukast+Paracetamol+Moxifloxacin	5	5.7%	5.7	18.4
Clarithromycin+Ranitidine+Cetirizine	3	3.4%	3.4	21.8
Salbutamol+Aminophylline	4	4.6%	4.6	26.4
Omeprazole+Temazepam	5	5.7%	5.7	32.2
Itropride+Domperidone+Ranitidine	4	4.6%	4.6	36.8
Levofloxacin+Diclofenic+Femotidine	6	6.9%	6.9	43.7
Cholorothiazide+Atenolol+Paracetamol	2	2.3%	2.3	46.0
Atenolol+seretaline	4	4.6%	4.6	50.6
Celecoxib	5	5.7%	5.7	56.3
Clindamycin+ Tramadol+Valsartin	4	4.6%	4.6	60.9
Cefuroxime+flurprofen+Esomeprazole	2	2.3%	2.3	63.2
Esomeprazole+metronidazole+clarithromycine	5	5.7%	5.7	69.0
Femotidine+Artemether+Panadol	4	4.6%	4.6	73.6
Glipizide+ Salbutamol	4	4.6%	4.6	78.2
Losartan+ Prazosin+Sertraline	3	3.4%	3.4	81.6
Metronidazole+Dextrose+ ciprofloxacin	3	3.4%	3.4	85.1
Fluconazole+ Betamethasone	4	4.6%	4.6	89.7
Enlapril+ Diazepam	4	4.6%	4.6	94.3
Cefixime+Prednisolone	5	5.7%	5.7	100.0
Total	87	100.0	100.0	

Table 4. Questions and answers Pre and Post counseling

S. No	Questions	Pre-counseling				Post Counseling				P-value
		Yes	%	No	%	Yes	%	No	%	
1	Medicines use	110	73.3%	40	26.7%	138	92%	12	8%	.000
2	Name of medicines	36	24%	114	76%	70	46.7%	80	53.3%	.000
3	Medicines strength	10	6.7%	140	93.3%	40	26.7%	110	73.3%	.000
4	Medicines dose	64	42.7%	86	57.3%	105	70%	45	30%	.000
5	Method of use of Medicines	113	75.3%	37	24.7%	132	88%	18	12%	.005
6	Time of medicines Taken	122	81.3%	28	18.7%	140	93.3%	10	6.7%	.002
7	Duration of therapy	20	13.3%	130	86.7%	60	40%	90	60%	.000
8	DDIS	8	5.3%	142	94.7%	32	21.3%	118	78.7%	.000
9	DFIS	3	2%	147	98%	22	14.7%	128	85.3%	.009
10	Storage conditions	27	18%	123	82%	93	62%	57	38%	.000
11	Missed doses and Solutions	7	4.7%	143	95.3%	70	46.7%	80	53.3%	.000
12	Special precautions of drugs	0	0%	150	100%	15	10%	135	90%	.000
13	Life style Modification	17	11.3%	133	88.7%	60	40%	90	60%	.000
14	Total	537	357.9	1413	942.1	977	651.69	973	648.31	
15	Average	41.30	27.5%	108.70	72.5%	75.2	50.13%	74.8	49.87%	

of patients such as patients knowledge about drug-specific use before counseling was 73% in patients, whereas after counseling it increases up to 92%. It shows the significance of patients' proper counseling and education in managing diseases during treatment in hospital and after discharge in homes.

5. CONCLUSION

It is concluded that pharmacist counseling and providing education to patients can significantly decrease the ADRs and increase the compliance of drugs that will ultimately enhance patients' quality of life. It was recommended that the hospital should appoint the pharmacist, especially a clinical pharmacist, and Hospital administration should arrange the programs for the awareness of patients on appropriate uses of drugs and their side effects.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s). Consent was taken from the hospital administration and patients.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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