Medication Adherence and Health Outcomes: A Public Health Perspective

Chiranjeev Singh[1], Harish Jaiswal[2]

[1]*Assistant Professor, Department of Pharmacy, Kalinga University, Raipur, India.*

[2]*Assistant Professor, Department of Pharmacy, Kalinga University, Raipur, India.*

KEYWORDS	ABSTRACT
Health, Health care, pharmacist, pharmaceutical care.	Medicine is a two-edged sword: while it can treat a patient's illness, when applied carelessly, it also has the potential to do more harm than good. Ensuring that patients receive appropriate medication for their clinical condition at the appropriate time, by the appropriate channel, and in the appropriate doses should be the top priority for any healthcare system. Polypharmacy can be helpful because numerous morbidities are common, but it can also have unintended harmful effects. The co-morbidity-polypharmacy score uses the patient's physiological age rather than their chronological age to predict how their therapy will turn out. Any departure from the medication's intended therapeutic impact may be regarded as a drug-related issue. The purpose of this study was to examine the effects of clinical pharmacist interventions on drug-related issues in prescriptions for polypharmacy as well as the cost-benefit analysis of clinical pharmacy services. The particular goals were to recognise and address drug-related issues, find out how well health care providers received clinical pharmacist interventions, analyse the cost-benefit of clinical pharmacy services, and create and suggest a clinical pharmacists intervention form to standardise and record drug-related issues.

1. Introduction

Every healthcare system prioritises patient safety above all else, thus if there are significant problems with patient safety, the system cannot operate effectively. One could think of medicines as two-edged swords. One of the most effective tools for reducing or mitigating symptoms or unpleasant feelings resulting from medical conditions is medicine. When not used appropriately, a powerful weapon like this one might also have some negative repercussions. Many times, medications are used to prevent certain diseases, particularly those that are life-threatening. If the medication used to prevent the disease causes major complications, the preventive initiative will not be successful, even though a significant amount of healthcare resources may have been used for it [1]. Polypharmacy is the practice of using multiple medications to treat a patient's illness. This may be because there are various formulations available that target the patient's various illness conditions in relation to the patho-physiological changes that are anticipated as the disease advances. However, because of the severe changes in the patients' lifestyles, the treatment of the diseases that are currently plaguing them has become so complex that most of them would be dealing with more than one illness condition at any given moment. The prognosis of disease conditions is typically determined by taking into account the patient's age, but if the patient's disease conditions are not taken into consideration along with the medications they are taking, the calculations may eventually become outdated [2]. By combining all of the patient's disease conditions with the appropriate pharmaceuticals used to slow the disease's progression or relieve its symptoms, a formula was created to estimate the patient's physiological age. The term for it is the Comorbidity-Polypharmacy Score. It is easily estimated by adding the number of medications recommended for the relevant number of disease problems to the number of drugs given to the patient.

Occasionally, a side effect brought on by medication may be misdiagnosed as a sign of a brand-new issue and treated as such with an additional prescription. To lower the likelihood of negative responses, always start newly introduced medications or formulations at modest dosages and titrate up. If any new symptoms appear, suspect the medications, especially if the drug was just started or the dosage increased. Enquire if the patient has developed any new symptoms, especially if they have recently begun taking a medication or had its dosage adjusted [3].

2. Literature Review

Physicians prescribe medications to their clients, who are patients, in order to treat their illnesses resulting from alterations in their lifestyle that are not infectious in nature or from physiological changes brought on by certain infectious agents. Pharmacological medicines are regarded by doctors as one of the most effective tools for accomplishing this goal. The number of medications prescribed to patients has increased dramatically with hidden drug-related issues, which ultimately leads to a decrease in the retrograde quality of life, as the usage of medications increases with an increase in disease conditions and the availability of specific agents to control some of the ailments of the patient [4]. The rise in drug-related injuries may be caused by a variety of factors, including the complexity of treatment with access to clinical judgement specialists, the availability of pharmaceutical agents for the management of specific symptoms in patients with multiple conditions, and the co-existence of multiple disease conditions in patients as a result of lifestyle changes from working class survival to sedentary populations with high levels of stress [5]. Healthcare professionals who deal with medication therapy need to be up to date on all of the pharmacological weapons in order to support reasonable drug therapy in complex treatment scenarios. From the time a medication is chosen until it is administered to a patient, mistakes might happen. Moving from one location to another, or from one professional to another, is a risky situation that requires strict supervision to avoid drug-related accidents. By computerising the prescription process from the point of creation to the point of final administration by hospital nursing staff, some drug-related injuries can be reduced [6]. Moreover, a licensed clinical pharmacist who has received extensive training in all facets of medication, from its unprocessed extraction to its safe distribution in patients, is sufficiently watchful. The quality of care provided to the underprivileged can undoubtedly be improved by the ongoing education program to keep prescribers and other healthcare professionals up to speed as well as the occasional journal clubs. A drug-related injury is defined as a departure from the expected positive result of therapy with a pharmacological agent. It can take many different forms, from the mildest kind of itching brought on by increased histamine release to the irreversible damage of an organ or the patient's death. Drug-related injuries also have an economic impact because healthcare resources are used to lessen or mitigate the side effects of treatment. This is particularly significant in the Indian context, where government funding for treatment is significantly less than in developed nations. Many patients in India come from economically disadvantaged backgrounds, and the money they spend on medical care may not even come close to covering their basic needs [7].

3. Materials And Methods

Patients were chosen at random according to inclusion and exclusion standards. Since the complete population cannot be investigated at this time, patients were chosen at random from the population [8]. A form that was specifically created for data collecting was used to gather the data. After the data collection form was designed, a pilot research was carried out. The specifically created data collection form contained all of the evaluations related to the lab research and case file reviews. From the medical records, retrospective patient demographic information, relevant test results, and treatment details were taken out. During the prospective data collection period, direct interactions with patients, their carers, and other healthcare personnel involved in the treatment of that specific patient were also conducted. Enrolment in the trial was granted to patients who fulfilled the study requirements [9]. Both prospective and retrospective instances' patients were chosen after the clear inclusion and exclusion criteria were met. The research samples were chosen in a manner that ensured they accurately represented the study community from which they were drawn. In the case of prospective arm patients, the research

pharmacist periodically reviewed randomly selected polypharmacy prescriptions from the time of admission until discharge in order to determine whether or not treatment outcomes deviated from expectations. The approach of randomisation was employed to pick a subset of patients having prescriptions for polypharmacy from a wider cohort. Our research used the GRAPHPAD PRISM software, which is freely available online, as the technique for randomisation. Using the same software, the randomisation procedures were applied to the retrospective cases as well.
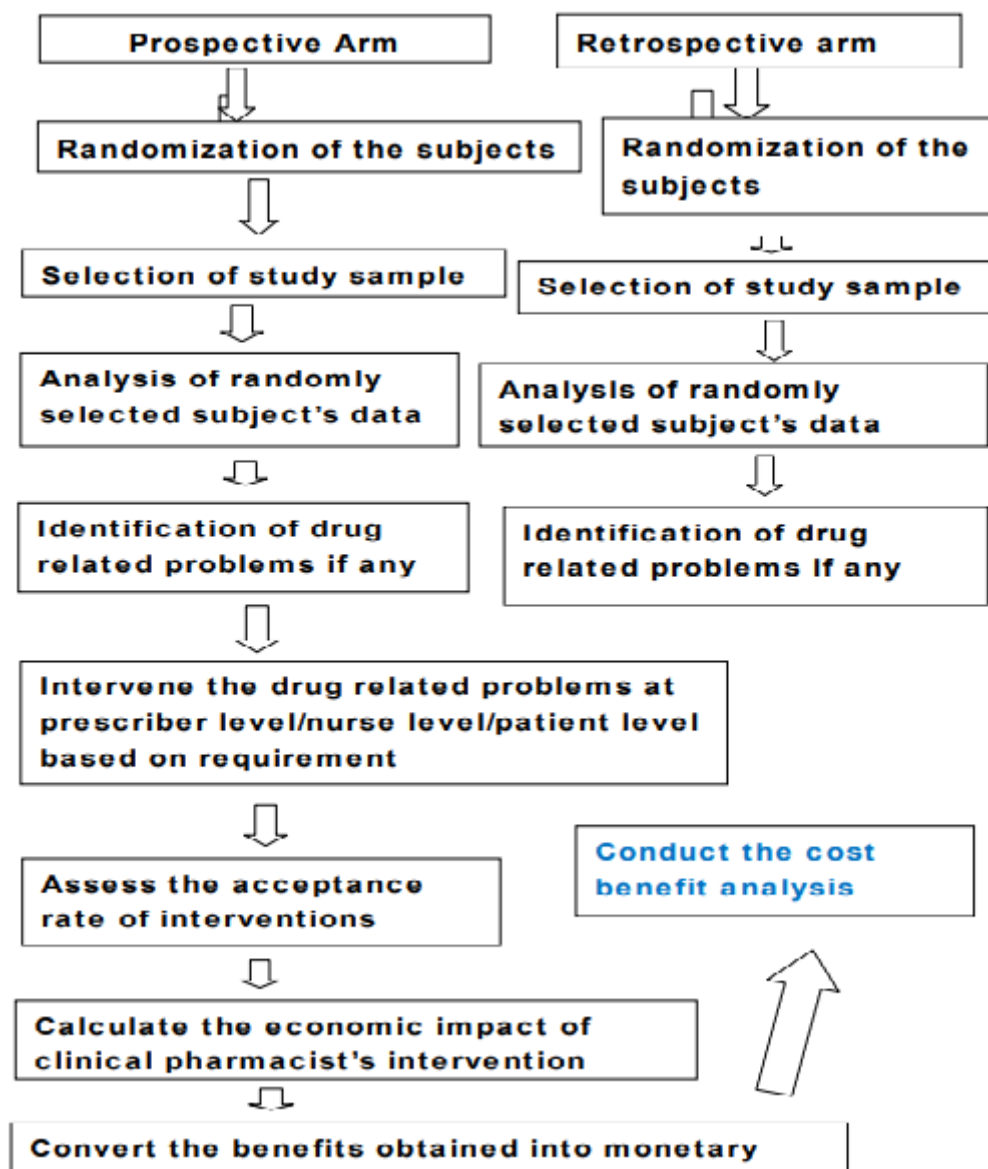

Figure 1. system flow

4. Results and Discussion

Based on the goals and the hypothesis that was tested, descriptive statistics were used to analyse the data. Descriptive statistics are used to measure averages, and measures of dispersion and averages are regarded as descriptive measures. The association between the drug-related issues found in the prospective arm and the retrospective arm in terms of drug and dose selection was examined using the chi-square test. Our study's findings were contrasted with those of other pertinent investigations. The chi-square test is arguably the most popular nonparametric test available. The gathered information has a normal distribution and is measured at the nominal or ordinal level. It is not frequently applied to the assessment of continuous data. The relationship between cause and effect can be examined using this

test. Since no assumptions are made about the population's properties, this test can be referred to as the distribution-free test.

Table 29. Main Barriers perceived by Pharmacists in
Implementation of PhC

S. No.	Barriers in providing Pharmaceutical-Care	Agree/Yes n (%)	Disagree/No (%)
1.	Lack of understanding of the PhC concept	115 (65.7)	60 (34.3)
2.	Fear of change to new professional role	99 (56.5)	76 (43.5)
3.	Lack of motivation or vision on professional Development	129 (73.7)	46 (26.3)
4.	More inclination towards dispensing practice	141 (80.5)	34 (19.5)
5.	Lack of therapeutic/clinical knowledge for adequate counseling	153 (87.4)	22(12.6)
6.	Lack of access to effective Drug info Resources	152 (86.8)	23(13.2)
7.	Lack of a systematic approach to clinical problem-solving	148 (84.5)	27(15.5)
8.	Lack of counseling guideline or counseling Training	145 (82.8)	30(17.2)
9.	Lack of documentation to provided care	116 (66.2)	59(33.8)
10.	Lack of Pharmaceutical care courses in the undergraduate curriculum	168 (96.0)	07(04)
11.	Lack of continuity of quality improvement	158 (90.2)	17(9.8)
12.	Lack of access to full patient information	127 (72.5)	48(27.5)
13.	Lack of patient interest itself	154 (88.0)	21(12)
14.	The improper layout within the pharmacy	118 (67.4)	57(32.6)
15.	Inadequate private counseling area	143 (81.7)	32(18.3)
16.	Lack of time and high patient load	150 (85.7)	25(14.3)
17.	Lack of staff members	153 (87.4)	22(12.6)
18.	Lack of trained staff	170 (97.1)	05(2.9)
19.	Lack of teamwork concept	152 (86.8)	23(13.2)
20.	Lack of professional fees to reward care Services	129 (73.7)	46 (26.3)
21.	Poor perception of Pharmacists care services by doctors	137 (78.2)	38(21.8)
22.	Poor relationship or rapport with Physician	154 (88.0)	21(12)
23.	The current education curriculum is inadequate to	134 (76.5)	41(23.5)
24.	Lack of training in pharmaceutical care.	161(92.0)	14(08)
25.	Lack of confidence	136 (77.7)	39(22.3)
26.	Lack of Knowledge and Attitude towards Counseling	52 (29.7)	123(70.3)

There was a test group and a control group in this prospective interventional trial. 731 patients were included in the study as study subjects from the test and control groups. Since the control group would not receive interventions to prevent or control drug-related injuries for research purposes, it was unethical to pick the control group from the prospective study group [10]. Instead, the control group was chosen from the retrospective arm. It has been discovered that the general population's health is more influenced by their physiological age than by their chronological age, which is what is typically taken into account when allocating government funding and insurance coverage. Diabetes and hypertension are two lifestyle disorders that occasionally affect the younger generation. In certain situations, it is determined that taking the patient's physiological age into account is more appropriate than their chronological age. Actually, the number of diseases a patient has at any given time and the number of prescriptions they take each day are strongly correlated with the patient's physiological age. Because of this, a unique instrument known as the comorbidity-polypharmacy score is used to forecast the patient's physiological age. The patient's physiological age increases along with the comorbidity polypharmacy tool score, increasing the likelihood that diseases may occur or that their existing problems will worsen.

5. Conclusion

Drug-related issues are a harsh reality, but they are often overlooked or misdiagnosed and blamed on unrelated circumstances that may not have any bearing on the poor result of care received in a hospital setting because there is no statistically significant difference in the number of drug-related injuries across domains. The clinical pharmacy service is critically needed in developing nations like India, where the recommendations made by the clinical pharmacist are highly valued by prescribers, nurses, and patients themselves in all three domains of intervention. The significance of clinical pharmacy services in India is highlighted by the benefit to cost analysis ratio with a value greater than one. Similar to the acceptance rates observed in industrialised nations where clinical pharmacy services have been established for many years, the level of acceptance of clinical pharmacist interventions by other healthcare providers, such as clinicians and nursing staff, is comparable.

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