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Randomized clinical trial (RCT) of a clinical pharmacist intervention to reduce drug misuse and improve inappropriate prescribing in hospitalized patients in province of Al Basra

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***Abstract*---**Objective: To determine if a multimodal pharmacist intervention based on medication review, patient interview, and follow-up can minimize the incidence of pharmaceutical prescribing errors between patients receiving clinical pharmacist intervention and patients receiving just usual care. Method: A randomized, controlled trial of 626 patients aged 62 and older with polypharmacy (five chronic drugs) from a general hospital was conducted. During all scheduled appointments, a clinical pharmacist meets with intervention group patients to assess their drug regimens and provide recommendations to them and their doctors. Prescription appropriateness, drug interaction, adverse drug events, medication compliance and knowledge, number of drugs, patient satisfaction, and physician receptivity were the outcome measures. Result: Inappropriate prescribing scores declined significantly more in the intervention group than in the control group (P = 0.0036) There was no difference between groups at condition of life (P = 0.68). Doctors were more receptive to the intervention and followed clinical pharmacist's recommendations more frequently than they were for control patients (50.63% versus 49.37%). Conclusion: According to this study, involving clinical pharmacists in discovering and discussing prescription discrepancies reduced medication inconsistencies in the medical record. This study found that clinical pharmacists play a critical role in identifying drug discrepancies and communicating this information to minimize their impact.

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Introduction

Medication errors can occur during any transition of care, such as when a person is hospitalized or discharged from a medical center[1]. Among the mistakes are omitted drugs, out-of-date dosages, adverse effects, and non-active drug. Poor communication at transition points has been identified as a significant cause of prescription mistakes and adverse drug events[2]. Medication lists in hospitals, physician offices, and community pharmacies may all contain different information. Medication list errors are common, with reported rates in hospitalized patients approaching 70% of patient lists in some reports[3, 4].

Additionally, approaches to enhance prescribing may be strengthened if implemented by a health care professional who collaborates directly with primary care physicians on clinical staff. Clinical pharmacists working in ambulatory care settings may be in an ideal position to collaborate with health care specialists to reduce inappropriate prescribing[5]. Furthermore, these clinical pharmacists can provide pharmaceutical care to patients in identifying, resolving, and preventing drug-related problems. There are few well-designed studies that assess the impact of clinical pharmacists on improper prescribing in hospitalized patients. ls the impact of such interventions may be improved by focusing on high-risk groups, such as patients with polypharmacy (the use of numerous medications), which is a major risk factor for inappropriate prescribing[6, 7].

As a result, the goal of this randomized, controlled trial was to assess the efficacy of persistent clinical pharmacist interventions in inpatients with polypharmacy and to compare the rates of patients getting clinical pharmacist interventions with those receiving standard physician care. The study's findings cover convenience, health-related quality of life, drug interactions and side effects, drug compliance, quantity of prescriptions, patient satisfaction, and physician responsiveness to criticism[8].

Aim of study

The goal of this study was to see if the clinical pharmacist's involvement in hospital health care, as well as communication about drugs with no interactions and intervention during hospitalization, could help patients recover more quickly.

Method

Trial design and patients

Patients were considered eligible if they were 63 years old or older, had at least approximately one of the following diagnoses: hypertension, hyperlipidemia, heart failure, coronary artery disease, myocardial infarction, transient ischemic attack, stroke, diabetes, asthma, chronic obstructive pulmonary disease, or need anticoagulation, and had polypharmacy (the use of five or more prescribed drugs

on a daily basis), spoke and understood quite well, and were new to acute admissions. Patients were excluded if they had been pronounced terminally ill; were suicidal, were in detention, were under isolation precautions, or had aphasia or severe dementia. Patients were enrolled and followed from January 1 to February 28, 2021[9].

An organized, patient-centered medication review was undertaken by a clinical pharmacist immediately after the patient was admitted, when laboratory data became available and the primary medical admission report was completed, in the basic intervention group[10]. During the drug review, the following three questions were considered: Were there any untreated diagnoses? Was the treatment's goal met? Was the treatment in accordance with current national guidelines in terms of dose, drug selection, and treatment time? We concentrated on the medications most typically associated with hospitalizations, such as low-dose aspirin, anticoagulants, diuretics and (NSAID) nonsteroidal anti-inflammatory drugs other than aspirin[11]. In addition, all drugs on the medication list were evaluated based on the indication for treatment, drug dose (taking into account renal failure, age, and so on), adverse drug events, therapeutic duplication, dosage time and interval, drug formulation and strength, interactions, contra-indications, precautions, and specific patient characteristics. Our participating pharmacists were not permitted to make changes to patient's medications following the medication review. but they did write potential changes in the patient data (clinical pharmacist intervention sheet) and, if feasible, spoke with the patient's physician, who would subsequently follow or reject the recommendation.

Study intervention

The clinical pharmacist used a motivated qualitative method to conduct a 15-minute structured patient interview that included a detailed summary of pharmacological treatment modifications during the stay[12, 13]. Dose adjustments, new medications, drug discontinuation, drug administration, adverse drug events, adherence, and cost were among the issues discussed throughout the interview. Motivational interviewing is a coaching technique that aims to ensure adequate patient behavior in order to reduce health-related events such adverse drug reactions and other drug-related concerns[13]. Clinical pharmacists were trained to execute all interventions. During the study, two distinct pharmacists were involved in data collection, although not at the same time due to employment changes and other factors. Furthermore, before participating in the study, all pharmacists were educated in medication review workshops and had completed a 2-day training in motivational interviewing with the following practice sessions.

Patients in the control group were given standard hospital care. During the trial period, the clinical pharmacist did not speak with or advise control group or their physicians. Written pharmacological therapy recommendations for control patients were not discussed or given to their primary physician prior to randomization. but were filed for evaluation at the end of the trial. Patients in the intervention group received both conventional and clinical pharmacist care. The clinical pharmacist intervention was guided by the principles of pharmaceutical

care, which is defined as "a process in which pharmacists collaborate with patients and other health care professionals in designing, implementing, and monitoring a treatment plan that will produce specific therapeutic patient outcome[14].

Sample selection

For the objectives of this study, a convenience sample of 626 individuals with various disorders (hypertension, coronary artery disease, diabetes, etc.) was divided. There are two groups: those who get clinical pharmacist health care and those who do not receive clinical pharmacist health care.

Statistical analysis

Percentages, frequencies, and mean SD were used when applicable. Statistical significance was defined as a p value less than 0.05. The Predictive Analytics Software version 19.0 was utilized. ANOVA and Chi square were used to compare demographic differences between study subgroups. The number of medication discrepancies per patient at each level of discrepancy significance was the dependent variable in the primary analysis. The non-parametric Kruskal_Wallis ANOVA was used to test for differences between study groups because the data were not normally distributed.

Results

According to the study's findings, we invited 626 patients to engage in the study, and the participants accepted to participate in the study and receive health care at the hospital. A total of 317 patients were diagnosed with hypertension, hyperlipidemia, heart failure, coronary artery disease, diabetes, cancer and asthmatic attack (34.4%, 3.8%, 17.4%, 17%, 23%, 1.9%, and 2.5%) respectively, they received clinical pharmacist intervention and gets approved from doctor were randomized to control groups (309) patients were diagnosed with hypertension, hyperlipidemia, heart failure, coronary artery disease, diabetes, cancer and asthmatic attack (110%, 13%, 44%, 51%, 75%, 9%, and 7%) respectively, they received only usual care without any intervention from a clinical pharmacist. As a result, 626 patients were included in the primary analysis. Table 1 illustrates the baseline characteristics of the patients included in the study. This trial lasted two months. As indicated in Figure 1,2, the overall median age of the participants was 63 years, (62-65) years is the interquartile range; and the percentage of gender type was 60.4 % (378) were men and 39.6 % (248) were women.

At the hospital, pharmacists provided 317 interventions to doctors, with some of these interventions, drug interaction (DDI), including Phenytoin + Phenobarbital, Amikacin + Vancomycin, Lasix + Garamycin, and so on. Other examples of dose and administration are Ceftriaxone vials, Garamycin ampoules, Atorvastatin tablets, Nystatin oral drops, Salbutamol inhalers, and so on. Another intervention of a drug's adverse effects Reactions such as Ramipril, Atenolol, Aspirin, Digoxin... etc. As well as a lack of drug availability such as Lactulose syrup, Ondansetron ampoule, Lincomycin vial... etc. The pharmaceutical interventions suggested during medication review were implemented at a rate of 50.63 %[11]

Table 1: Shows the baseline characteristics of patients.

Characteristic (n=626)			Intervention (n=317)	Control (n=309)
Sex, No. (%)	Male	378 (60.4%)	162 (51.1%)	187 (60.5%)
	Female	248 (39.6%)	155 (48.9%)	122 (39.5%)
Mean age	63 ±3.5		62.7 (3.7 ± SD)	62.9 (3.8 ±SD)
No. of drugs			5--9	5--9
Clinical pharmacy intervention. (%)				
Drug-drug reaction (DDI)			115 (36.2%)	97 (31.3%)
Adverse drug reaction			13 (4%)	2 (0.6%)
Dispensing			55 (17.3%)	27 (8.7%)
Unavailability of the drug			7 (22%)	13 (4.2%)
Monitoring			24 (7.5%)	36 (11.6%)
Patient adherence			21 (6.6%)	33 (10.6%)
Administration			48 (15%)	65 (21%)
Dosing			34 (10.7%)	36 (11.65%)
Patient conditions, No. (%)				
Hypertension			109 (34.4%)	110 (35.6%)
Hyperlipidemia			12 (3.8%)	13 (42%)
Heart failure			55 (17.4%)	44 (14.2%)
Coronary artery disease			54 (17%)	51 (16.5%)
Diabetes			73 (23%)	75 (24.3%)
Cancer			6 (1.9%)	9 (2.9%)
Asthma or COPD			8 (2.5%)	7 (2.3%)

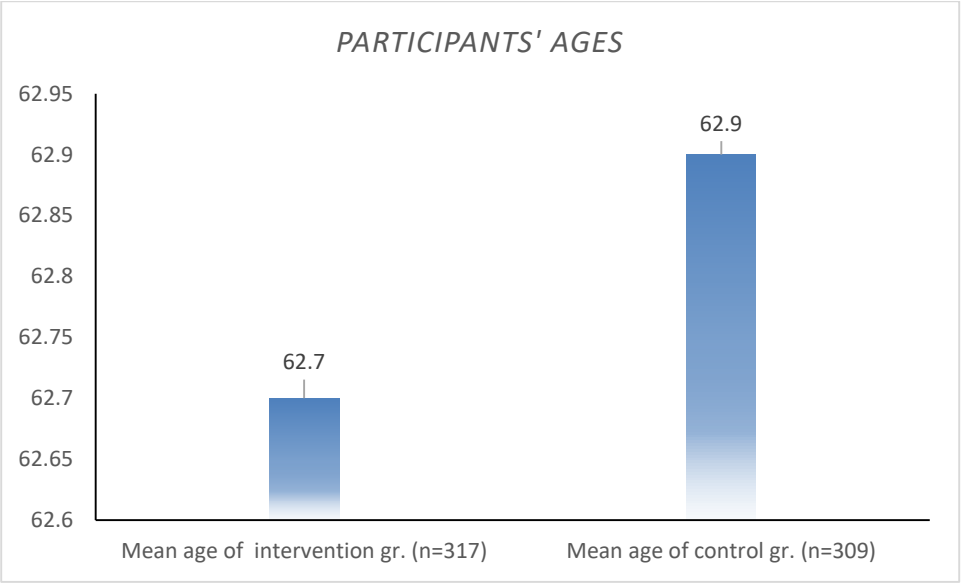

Figure 1: The study's age graph

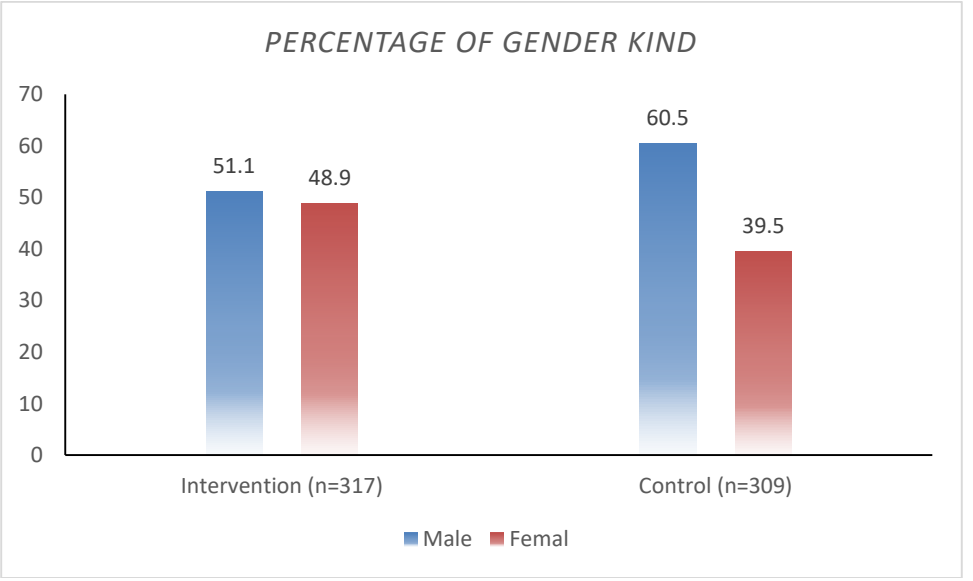

Figure 2: Graph of gender

Discussion

To our knowledge, this is one of the few studies that show how a clinical pharmacist providing pharmaceutical care can help improve and maintain prescribing appropriateness in primary care patients with polypharmacy. We discovered a difference in the reduction of inappropriate prescribing between groups. The extent of this drop is similar to the improvement in prescription drug ratings for patients[15], Inappropriate prescribing scores declined significantly more in the intervention group than in the control group (P = 0.0036) There was no difference between groups at condition of life (P = 0.68). Doctors were more receptive to the intervention and followed clinical pharmacist's recommendations more frequently than they were for control patients (50.63% versus 49.37%). Our discovery that high-level medication discrepancies in the physician record over the study period were influenced by pharmacist intervention has revealed that pharmacists can influence drug-specific outcomes following hospitalization. In the study, pharmacists also reconciled patients' prescription regimens. Furthermore, a recent multifaceted intervention that included pharmacist-led medication reconciliation and tailoring, patient education, and collaborative care between the pharmacist and the patients' primary care clinician and/or cardiologist to improve cardiovascular medication adherence after hospital discharge[16, 17]. Furthermore, our findings are consistent with prior studies of polypharmacy in ambulatory patients, which show few major issues with medication interactions and therapeutic duplications

Limitation

The current study has some potential limitations, such as a short study duration and just two clinical pharmacists providing interventions, which may limit our generalizability. To reduce the impact of personal traits, the intervention procedure focused on content, was real proof, and was purposely designed to

engage doctors rather than criticize prescriptions. Despite these important limitations, this study found that a clinical pharmacist that can provide pharmaceutical care can enhance and maintain prescribing suitability for high-risk elderly primary care patients with drug interactions, with the possibility of a reduction in adverse drug events and no change in health-related quality of life. Long term studies are needed to more fully evaluate the efficacy of such clinical pharmacist interventions in non - academic settings. These studies should be larger, longer, directed toward identifying and improving prescribing problems (e.g., dosage, instructions, and cost), and use more sensitive adverse drug reactions and disorder health-related quality of life measures. Furthermore, the economic consequences of such future programs must be investigated using either formal cost-effectiveness or cost-benefit analysis[18].

Conclusion

According to this study, involving clinical pharmacists in discovering and discussing prescription discrepancies reduced medication inconsistencies in the medical record. This study found that clinical pharmacists play a critical role in identifying drug discrepancies and communicating this information to minimize their impact.

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Ethical approval

The Ethics Committee of the University of Basra/Medical College approved this study design. The initiative received enthusiastic approval from the committee.

Conflicts of interest: No conflicts of interest to report.

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