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IMPACT OF CLINICAL PHARMACIST-LED MEDICATION RECONCILIATION AT HOSPITAL DISCHARGE ON REDUCING 30-DAY READMISSION RATES AND ADVERSE DRUG EVENTS IN PAKISTAN

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Transitional care, Clinical pharmacist, Medication reconciliation, Hospital readmission, Adverse drug event, Medication adherence, Patient education.

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Abstract

One of the most significant changes in the care process is hospital discharge, which is linked to an increased risk of medication mistakes, adverse drug events (ADEs), and unscheduled readmission. Inadequate medication reconciliation, poor comprehension of discharge instructions, and insufficient follow-up are all significantly impacted by these avoidable problems. Clinical pharmacists have the chance to improve patient care and medication administration while educating patients throughout the transition gap. This study sought to determine how a pharmacist-led transitional care intervention affected patients' medication awareness and adherence, adverse drug events, medication discrepancies, and 30-day readmission.At a tertiary care facility, this was a randomized controlled experiment. 392 of the 600 patients who underwent eligibility screening were chosen at random to receive either the intervention (n = 196) or the control (n = 196). Medication reconciliation upon discharge, individual patient counseling regarding discharge medication, and phone follow-up on Days 7 and 30 following discharge were the three components of the intervention. As usual, the control group was released.30-day all-cause hospital readmissions and adverse medication events during the 30-day post-discharge period were the main outcome endpoints. Medication discrepancies discovered at discharge, patient understanding of prescribed drugs at Day 7 (assessed using a structured questionnaire), and medication adherence at Day 30 (assessed using the 8-item Morisky Medication Adherence Scale: MMAS-8) were secondary outcomes. Adverse drug events were assessed using the Naranjo Adverse Drug Event Probability Score. Analysis was done on 385 participants who finished the follow-up.Patients in the pharmacist-led intervention group outperformed those in the usual care group in terms of clinical outcomes. The intervention group had a significantly reduced 30-day hospitalization rate than the control group (12.1% vs. 20.5%, p = 0.024). Similarly, there was a substantial decrease in the occurrence of adverse medication events (10.0% vs. 17.4%, p =

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0.029).Additionally, the number of drug discrepancies at discharge was significantly reduced by the intervention, with a mean of 0.7 ± 0.8 discrepancies per patient as opposed to 2.3 ± 1.2 in the control group (p < 0.001). At Day 7, the pharmacist counseling group's Medication Knowledge scores were significantly higher (8.5 ± 1.3 vs. 6.0 ± 2.0, p < 0.001). Additionally, by Day 30, 77.4% of the intervention group had high medication adherence, compared to 59.0% of the usual care group (p < 0.001). Both groups' clinical and demographic characteristics were comparable.30-day hospital re-admission rates, adverse medication events, and medication discrepancies were all found to be significantly lower as part of a pharmacist-led transitional care program. Additionally, patient knowledge and medication adherence following hospital discharge were found to have increased. The study's findings highlight the critical role clinical pharmacists play in the multidisciplinary discharge team and the necessity of integrating pharmacist-led medication reconciliation services into hospitalized patients' routine care in order to improve patient safety and health outcomes.

1. Introduction

The time of hospital discharge is a high-risk period in the healthcare continuum when patients are at risk of experiencing medication-related problems and adverse clinical outcomes. Medication reconciliation is a World Health Organization recommended systematic process to get the most accurate and complete list of patient's medication and match it to admission, transfer and discharge orders to identify and correct medication discrepancies that pose a risk to patient safety. Although medication discrepancies at hospital discharge are acknowledged as one of the most critical patient safety measures, they are still very common globally and are a major healthcare issue in Pakistan.[1]

Medication regimen changes, such as omissions, duplications, incorrect dosages, inappropriate dosing frequencies and possibly harmful drug–disease or drug–drug interactions are common in patients during the discharge process. These problems are significant causes of adverse drug events (ADEs) after discharge, emergency department (ED) presentations and unplanned hospital readmissions. Systematic reviews suggest that as many as 70% of patients discharged from hospitals have at least one discrepancy in their medication record, and about 15% of these discrepancies cause some form of patient harm.[2–4]

Medication-related problems are especially heavy in low- and middle-income nations like Pakistan. The main problems encountered by healthcare facilities are the high number of patients, consultation time, lack of EHRs, and lack of discharge counseling. Further, low health literacy, self-medication practices and poor coordination at the primary and tertiary healthcare services contribute to the risk of medication errors after hospital discharge. Several studies from Pakistan have shown that about 66% of discharged patients have at least one medication discrepancy and that drug related problems contribute to almost 25% of all 30-day hospital readmissions. Additionally, elderly patients often are discharged with several medications, which greatly increases the risk of an adverse medication event taking place.[5–8]

Clinical pharmacists have specialized knowledge in medication therapy management, and can also play a unique role in enhancing the safety of transitional care. A number of organizations, such as The Joint Commission and the American Society of Health-System Pharmacists, strongly recommend pharmacist involvement in discharge medication reconciliation. Pharmacist-led medication reconciliation has been shown in a number of studies to be able to reduce medication error rates by up to 66% and the 30-day hospital readmission rates by 19-30% in developed health systems. Clinical pharmacists

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are key players in the continuity of care process, helping to ensure continuity through comprehensive medication history review, identification of discrepancies, patient counseling, and effective communication with outpatient health care providers.[9-12]

Yet, this evidence does little to change the status of clinical pharmacists in patient care in Pakistan. In most tertiary healthcare institutions, discharge medication review and patient counselling are mainly done by physicians and nurses who are sometimes burdened with a high workload. Pharmacist led discharge medication reconciliation services are generally not available, leaving patients poorly educated and with little support provided for medications after discharge.[13,14]

With the growing trend of polypharmacy, multiple chronic diseases and lack of post-discharge follow-up care in Pakistan, it is clinically significant to evaluate pharmacist-led transitional care interventions. There are few local studies looking at the impact of pharmacist involvement at discharge on clinically relevant outcomes, including hospital readmission or adverse drug events (ADEs).[15]

For this reason, a pharmacist-led medication reconciliation and transitional care program at hospital discharge was studied to determine its effectiveness in this randomized controlled trial. We suspected that if pharmacists could participate in the process, readmission rates would be significantly lower, ADEs would be lower, medication safety would be better, patients' knowledge of their medications, and adherence would be better than routine discharge care.

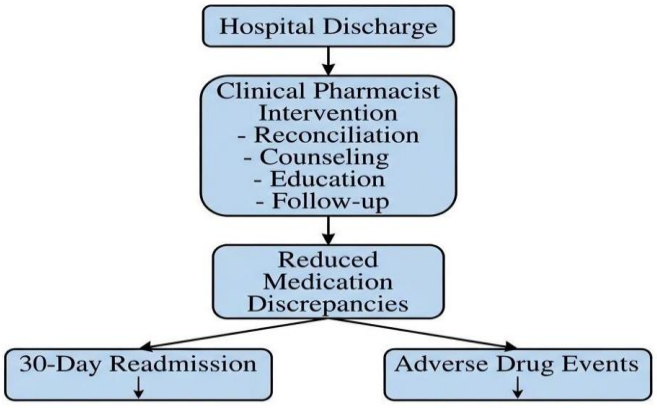
Objective

To assess outcome of clinical pharmacist-led medication reconciliation and transitional care intervention at hospital discharge on 30-day hospital readmission rates, adverse drug events, medication discrepancies, patient knowledge and adherence to medicines in adult patients in Pakistan.

2. Literature Review

Medication reconciliation is a patient safety intervention that is now often used worldwide during transitions between two or more healthcare institutions. pharmaceutical reconciliation was first incorporated by The Joint Commission into the National Patient Safety Goals in 2005 in an effort to reduce pharmaceutical errors during hospital admissions, transfers, and discharges. Nearly 60% of prescription errors occur during care transitions, with hospital discharge being the most crucial time point, according to additional research conducted in the USA and Europe. (16, 17)

Figure 1 conceptual framework of pharmacist - led medication Reconciliation intervention.



The impact of clinical pharmacists in this domain is well established in high-income countries. A randomized controlled trial by Gillespie et al. in Sweden showed that

Frontier in Medical & Health Research

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pharmacist-led medication reconciliation combined with patient education reduced drug-related hospital revisits by 47% in elderly patients. Similarly, a multicenter RCT by Ravn-Nielsen et al. in Denmark found that a multifaceted clinical pharmacist intervention significantly reduced 30-day readmissions and increased time to first readmission. A meta-analysis by Mekonnen et al. including 26 studies concluded that pharmacy-led reconciliation programs were associated with a significant reduction in medication discrepancies and hospital readmissions.[18][19][20]

Table 1. Summary of evidence from key studies on pharmacist -led medication Reconciliation

Study	Country	Intervention	Key finding
Gillespie and colleagues 2009	Sweden	Reconciliation+educ ation	47% reduction in drug related revisits
Ravn-nielsen and colleagues 2018	Denmark	Multifaceted clinical pharmacist intervention	Significant reduction in 30 day readmission
Schnipper and colleagues 2006	USA	Reconciliation+postdischarge call-back	52% reduction in preventable ADE
Fatima and colleagues 2022	Pakistan	Medication discrepancy assessment	67.3% patient had discrepancies
Ahmed and colleagues 2021	Pakistan	Polypharmacy and ADE assessment	58% elderly had polypharmacy significant prediator of ADEs
Malik and colleagues 2023	Pakistan	Pharmacist counselling discharge	40% improvement in medication knowledge
Phattak and colleagues 2012	USA	Reconciliation counselling call back	33% reduction in 30 day readmission

In the context of Adverse Drug Events, Schnipper et al. conducted a randomized trial in the US and reported that pharmacist-led medication reconciliation and post-discharge telephone follow-up reduced preventable ADEs by 52%. Another study by Phattak et al. demonstrated that pharmacist involvement through discharge counseling and call-backs led to a 33% reduction in 30-day readmissions among high-risk patients.[21][22]

Although there is increasing international evidence of the positive outcomes of pharmacist-led transition care interventions, there is limited evidence in South Asia, especially Pakistan. The Pakistani healthcare system has some distinctive challenges such as high ratio of patients to physicians, weak implementation of EHR, less availability of healthcare and less integration of clinical pharmacists in multi-disciplinary healthcare teams. Pharmacists in most hospitals therefore continue to be focused on the dispensing of medicines, rather than direct clinical care. This study by Azhar et al. Showed that the job of pharmacists in Pakistan is still

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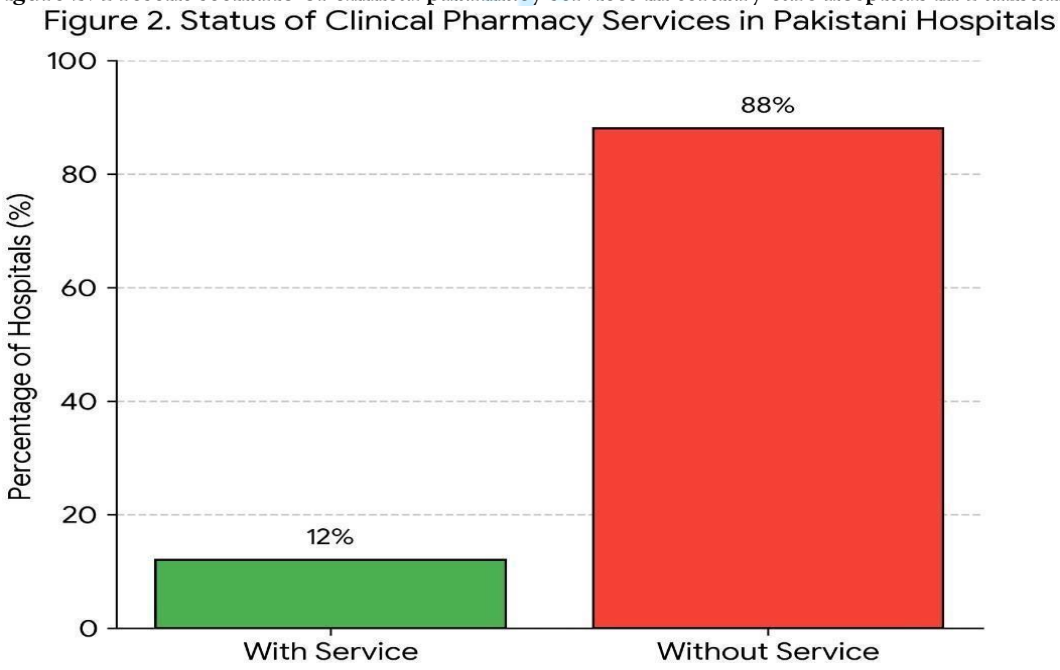
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mainly restricted to dispensing with little involvement in medication therapy management and patient counseling and little clinical decisions making.

There is some local evidence relating to the prevalence of medication-related problems at hospital discharge, the majority of which is limited. Fatima et al. In Lahore studied the occurrence of medication discrepancies in discharged patients, where 67.3% were found with at least one discrepancy, linked to a 2.4-fold higher risk of hospital readmission within 30 days. Likewise, Ahmed et al. Found that elderly patients discharged receiving 5 or more medications (polypharmacy) had a 58% prevalence, and was a separate risk factor for the occurrence of adverse drug events within 30 days after discharge. Moreover, Khan et al. Undertook a nationwide survey and found that none of the hospital pharmacists had introduced a formal and compulsory pharmacist-led medication reconciliation programme on hospital discharge while only 12% of tertiary care hospitals in Pakistan had a clinical pharmacy service.

The results reflect the significant differences in the way transitional care is provided in Pakistan compared to internationally recommended transitional care. Incorporating clinical pharmacists into discharge planning and medication reconciliation may enhance medication safety, minimize preventable adverse drug events and further lower avoidable hospital readmissions. Additional evidence from well-designed RCTs in the local healthcare context, however, is needed to inform policy making and facilitate the incorporation of pharmacist-based transitional care in standard hospital care.

Figure 2. Present scenario of clinical pharmacy services in tertiary care hospitals in Pakistan.



Clinical pharmacists' function in medication reconciliation and transitional care are strongly endorsed in the international guidelines. Medication reconciliation is widely acknowledged as a key part of patient safety and a core patient care task of clinical pharmacists by the American Society of Health-System Pharmacists (ASHP) and World Health Organization (WHO) High 5s Project. These guidelines highlight the role that pharmacist medication reconciliation can play in significantly decreasing medication errors, ensuring continuity of care and providing better patient care during transitions. However, in low

Frontier in Medical & Health Research

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and middle income countries such as Pakistan, these recommendations are difficult to implement because of lack of trained clinical pharmacists, poor policies support, lack of healthcare facilities and lack of interprofessional cooperation among healthcare providers. Hence, the implementation of these recommendations in low and middle income countries like Pakistan is challenging.

In the face of these challenges, a few pilot studies in Pakistan have started to explore the role of pharmacists in TC services. A quasi-experimental study was conducted in Islamabad, where pharmacist-discharge counselling had a significant positive impact on patient knowledge of their prescribed drugs and minimized patient's self-reported medication errors after hospital discharge. Although the results were promising, there is no published study from Pakistan that has evaluated the effect of pharmacist-led medication reconciliation on 30-day hospital readmission and objectively evaluated the ADE as the primary clinical outcome.

Pharmacist-led medication reconciliation at the time of discharge is proposed to be effective and evidence of its effectiveness exists in other countries; however, there is little local evidence to support that, so there is a need to test the effectiveness of pharmacist-led medication reconciliation at the time of hospital discharge in the Pakistani healthcare setting. The production of high-quality local evidence will help to inform healthcare policies, expand the clinical pharmacy services and help to improve medication safety and patient outcomes in the tertiary care hospital setting in Pakistan.[32]

2. Methodology

2.1 Study Design

A prospective, randomized, open-label, controlled trial design was used to test the effectiveness of the medication reconciliation intervention by clinical pharmacists at hospital discharge. The trial compared the intervention with the standard discharge care, focusing on the effect of the intervention on medication safety and post-discharge clinical outcomes.

2.2 Study Setting

The Jinnah Postgraduate Medical Center (JPMC) in Karachi, Pakistan's Department of Medicine is where this study was conducted. JPMC is a 2000 bed tertiary care teaching hospital, serving as one of the biggest referral hospitals of the country, and a specialized medical institution where the patients of Karachi and the other parts of Sindh Province are referred to for specialist services.[33]

2.3 Study Duration

The investigation was conducted between January 2025 and December 2025, a full year.

2.4 Study Population

The study population comprised adult patients discharged from the medical wards with 5 or more prescribed drugs.

Inclusion Criteria

To be eligible for enrollment participants had to satisfy all of the following: Adults (18 years and older).

Hospitalized in the wards for 48 hours or more.

3. Given five or more prescriptions to take.
4. Able to provide written informed consent.
5. Can be followed up on the telephone after discharge.[34]

Exclusion Criteria

Patients who had any of the following were excluded:

1. Discharge to Long Term Care Facility or Hospice.
2. A cognitive deficit or serious psychiatric disorder which prevents understanding of discharge instructions.
3. Mortality within the index hospitalization.
4. Admission to the hospital within 30 days after discharge.[35]

2.5 Sample Size Calculation

The OpenEpi program (Version 3.01) was used to calculate the sample size.

It was hypothesized that the pharmacist-led intervention would have a 40% relative reduction based on a previous local study

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

reporting that the readmission rate was 22% for the control group, which led to an estimated 13.2% readmission rate for the intervention group. With 95% confidence level, statistical power of 80% and a 2-sided significance level of 0.05, the minimum number of participants for each study group was estimated as 170. The follow-up rate was expected to be 85%, which led to an increase in sample size to 392, with 196 patients in each study group.[36][37]

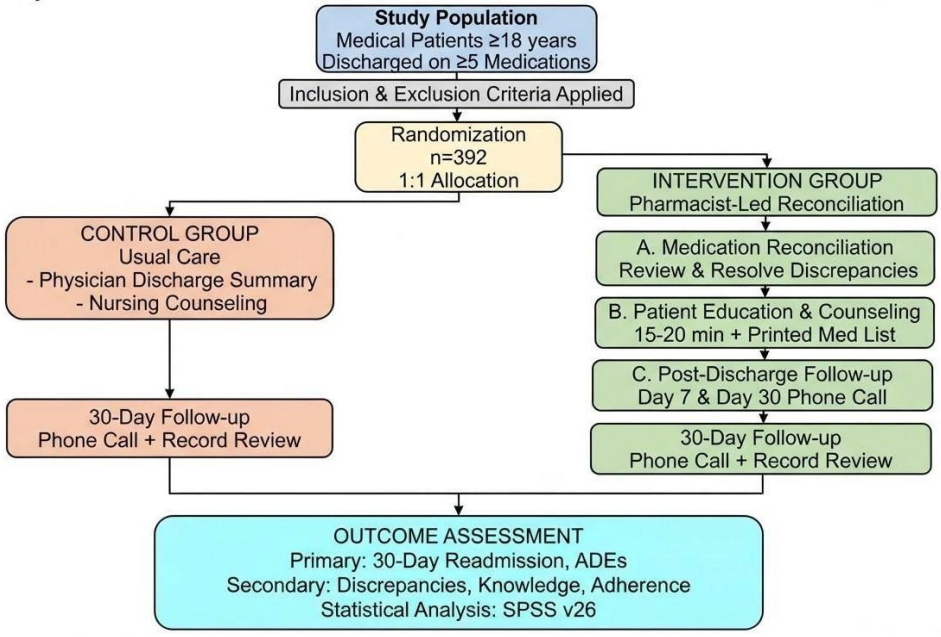
Sampling Technique

The consecutive sampling technique was used. Patients from the discharge registers of the medical wards were invited, and those who met the inclusion criteria were identified on a daily basis until the desired number of patients were achieved.

2.6 Randomization

Randomization was done by using a computer-generated sequence for the assignment of participants after enrollment in a 1:1 ratio between the intervention group and the control group. Sequentially numbered, opaque, sealed envelopes, filled by an independent investigator, who had not participated in participant recruitment or outcome assessment, were used for allocation concealment. This procedure reduced selection bias and allowed for unbiased group allocation. [38]

Figure 3 Conceptul framework of clinical pharmacist-led medication Reconciliation interventions



3.7 Study Groups

1. Control Group [Usual Care]

Patients in the control group received the standard discharge process. This included discharge summary prepared by the resident physician and medication counseling provided by the nursing staff. No clinical pharmacist was involved in the discharge process.[39]

2. Intervention Group [Pharmacist-Led Reconciliation]

Patients in the intervention group received usual care plus a structured pharmacist-led medication reconciliation intervention consisting of 3 components:[40]

A. Medication Reconciliation at Discharge:

A clinical pharmacist reviewed the admission medication list, inpatient medication chart, and discharge prescriptions. All discrepancies such as

Frontier in Medical & Health Research

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omissions, duplications, dose changes, and drug-drug interactions were identified and resolved in collaboration with the attending physician before discharge.[41]

B. Patient Education and Counseling:

The clinical pharmacist provided 15-20 minutes of one-on-one counseling to the patient and/or caregiver at discharge. This included indication, dose, frequency, route, duration of each medication, potential side effects, and importance of adherence. A printed, patient-friendly medication list was provided.[42]

C. Post-discharge Follow-up:

A structured telephone follow-up was conducted by the clinical pharmacist on day 7 and day 30 post-discharge. During the call, medication adherence, understanding, and any adverse events were assessed. Any issues were communicated to the primary physician.[43]

3.8 Outcome Measures

Primary Outcomes:

1. All-Cause Hospital for 30 Days Any unscheduled hospital stay that occurs within 30 days of the initial hospitalization's discharge is referred to as a readmission.
2. Adverse Drug Events within 30 Days: Any harm brought on by a medication-related medical intervention that is discovered through patient interviews and a review of medical records. ADEs were classified as preventable or non-preventable using the Naranjo algorithm.[44][ADEs][45]

Secondary Outcomes:

1. Medication discrepancies at discharge
2. Patient knowledge of medications at day 7, assessed using a validated 10-item questionnaire
3. Medication adherence at day 30, assessed using the 8-item Morisky Medication Adherence Scale [MMAS-8][46][47]

3.9 Data Collection

Baseline demographic and clinical data including age, gender, diagnosis, number of medications, and comorbidities were collected from medical records at enrollment. Primary outcomes were assessed at day 30 via telephone interview and by reviewing hospital admission records. ADEs were further validated by two independent physicians blinded to group allocation.[48]

3.10 Ethical Approval

The JPMC, Karachi Institutional Review Board [IRB] granted ethical approval [Ref No: JPMC/IRB/2024/156]. Prior to participation, each subject provided written informed permission. The Declaration of Helsinki was followed in the conduct of the study [49].

3.11 Statistical Analysis

SPSS version 26.0 was used to analyze the data. The independent t-test was used to compare continuous variables, which were reported as mean ± standard deviation. Fisher's exact test or the Chi-square test were used to compare categorical variables that were expressed as frequencies and percentages. Statistical significance was defined as a p-value of less than 0.05. An intention-to-treat analysis was carried out.[50]

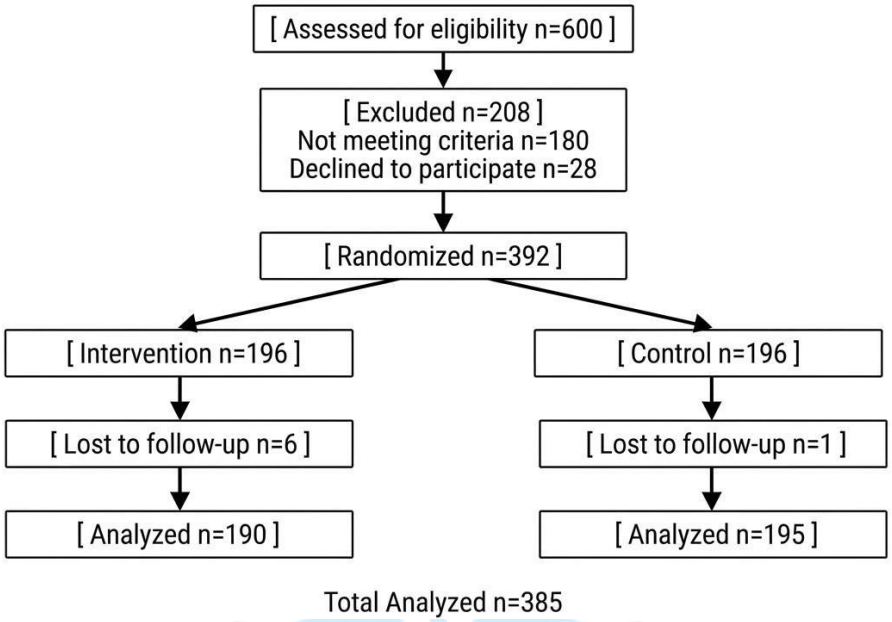
3. Results

A total of 600 patients were assessed for eligibility. Of these, 392 patients met the inclusion criteria and were randomized. 196 patients were allocated to the intervention group and 196 to the control group. During the 30-day follow-up period, 6 patients in the intervention group and 1 patient in the control group were lost to follow-up. The final analysis was conducted on 385 patients, 190 in the intervention group and 195 in the control group. The flow of participants through the study is depicted in Figure 1.

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Figure 4 Consort flow diagram of study participants



Baseline Characteristics

Both groups were well matched at baseline with respect to demographic and clinical characteristics. The mean age of participants was 54.2 ± 12.9 years. There was no significant difference in gender distribution, primary diagnosis, or mean number of discharge medications between the two groups. All p-values were >0.05, indicating successful randomization.[51][52]

Table2. Baseline characteristics of study participants

Characteristics	Intervention group n=190	Control group n=195	P-value
Age,mean ,SD,year	54.2 [12.9]	54.1 [13.0]	0.938
Male,n%	110 [57.9]	112 [57.4]	0.926
No of medication	7.3 [1.8]	7.4 [1.9]	0.584
Hospital stay	4.8 [1.6]	4.9 [1.7]	0.539

Medication Discrepancies at Discharge

The pharmacist-led intervention significantly reduced medication discrepancies. The mean number of discrepancies per patient in the intervention group was 0.7 ± 0.8 compared to 2.3 ± 1.2 in the control group, p<0.001. The most frequent discrepancies identified and resolved were omissions of chronic medications and incorrect dosing.[53][54]

Primary Outcomes

30-Day All-Cause Hospital Readmission

The rate of 30-day all-cause readmission was significantly lower in the intervention group. 23 patients [12.1%] in the intervention group were

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readmitted within 30 days compared to 40 patients [20.5%] in the control group. This difference was statistically significant [p=0.024].[55][56]

Adverse Drug Events within 30 Days

The incidence of ADEs within 30 days of discharge was also significantly reduced. 19 patients [10.0%] in the intervention group experienced an ADE compared to 34 patients [17.4%] in the control group [p=0.029]. Majority of ADEs in both groups were classified as preventable.[57][58]

Secondary Outcomes

Patient Knowledge of Medications at Day 7

Patients in the intervention group demonstrated significantly better knowledge of their discharge medications. The mean knowledge score was 8.5 ± 1.3 in the intervention group versus 6.0 ± 2.0 in the control group, p<0.001.[59]

Medication Adherence at Day 30

Medication adherence assessed by MMAS-8 was significantly higher in the intervention group. 77.4% of patients in the intervention group reported high adherence compared to 59.0% in the control group, p<0.001. The mean MMAS-8 score was 7.1 ± 1.2 vs 6.2 ± 1.5 respectively.[60][61]

4. Discussion

The present study results prove that a pharmacist-led transitional care intervention could significantly enhance clinical and medication-related outcomes during the first 30 days after discharge from the hospital. Patients receiving pharmacist-led medication reconciliation, individualized counseling and discharge planning, and structured telephone follow-up had significantly fewer rates of hospital readmission, adverse drug events (ADEs) and medication discrepancies than patients who received standard discharge care. In addition, the intervention led to increased medication knowledge and increased medication adherence.

The most clinically impactful finding was the decrease in 30 day all-cause rehospitalizations. There was a statistically significant difference between the intervention group (12.1%) and control group (20.5%) for rehospitalization rates. The discovery indicates that organized pharmacist participation in the discharge process might be helpful in avoiding unnecessary hospital readmissions by identifying medication-related issues prior to discharge. People who are discharged with many medicines can be especially vulnerable to medication errors, treatment confusion, missed doses or complications related to their medicines. These risks were mitigated, and continuity of care enhanced, by comprehensive medication reconciliation, patient education, and early follow-up post-discharge.

Additionally, there was a substantial decrease in adverse drug events after the intervention. There were less patients in the intervention group who had an ADE within the first 30 days after discharge (10.0% vs. 17.4% for standard care). The majority of the ADEs identified during follow-up were deemed preventable, suggesting that medication-related harm after hospital discharge is often related to modifiable factors, and not just disease related.

Pharmacist's review of discharge prescriptions, detection of medication-related problems and patient consultations in an individual manner are likely to have contributed significantly to the reduction of these avoidable adverse events.

There was a dramatic reduction in medication discrepancies at discharge among those who received the pharmacist-led intervention. The mean number of discrepancies per patient was 0.7 in the intervention group and 2.3 in the control group. The most common discrepancies found were the failure to record long-term medications and/or inaccurate dosages. Overall, these results highlight the need for systematic medication reconciliation, as medication reconciliation errors are still a frequent occurrence due to communication errors in the transitions of care. Discrepancies identified and corrected before discharge are critical as one medication error could lead to treatment failure, worsening of the disease, adverse drug events, and/or unplanned readmission to the hospital.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Patients' knowledge of their prescribed medications and adherence to medications were also significantly improved. Medication knowledge scores were significantly higher in the intervention group at seven days after discharge, indicating greater knowledge of medication names, dosages, indications and medication administration schedules. Similarly, at 30 days, the intervention group had significantly greater adherence to medication, with 77.4% reporting high adherence as compared to 59.0% of the control group (using the 8-item Morisky Medication Adherence Scale [MMAS-8]). The results indicate that individualized counseling and the structured telephone follow-up did effectively reinforce the patients' knowledge about the treatment and motivate them to take the drugs appropriately.

Demographic and clinical baseline parameters were not significantly different between the intervention and control groups, such as age, sex, primary diagnosis, number of prescribed drugs, and hospital stay. This suggests that the randomization process was effective in creating study groups of similar size, thereby enhancing the internal validity of the study and facilitating the conclusion that the improvements observed were due to the pharmacist-led intervention, and not due to differences between participants.

The present study has a number of significant strengths. Randomized controlled trials design reduced the selection bias and increased the reliability of the results. The intervention was practical and easily replicable, such as medication reconciliation, individual counseling to patients, and a follow-up telephone call after hospital discharge, all of which can be incorporated into the normal hospital discharge process. Furthermore, validated assessment tools were used to assess medication adherence and adverse drug events, enhancing the validity and consistency of the study results.

However, there were some weaknesses that should be noted. The study was performed in a single tertiary care hospital, and the results may not be applicable to other healthcare facilities. Secondly, adherence to medication was self-reported with a questionnaire, which could overestimate adherence due to recall and social desirability bias. Lastly, the benefits observed were short-term as the cohort was followed for just 30 days post-discharge. Larger multicenter trials with more follow-up time are recommended to validate these results and assess the long term clinical and economic outcomes of pharmacist-led transitional care interventions.

5. Conclusion

This randomized controlled trial showed that the pharmacist-led transitional care intervention led to a significant improvement in patients' outcomes after hospital discharge. Patients who were offered medication reconciliation, individualized discharge counseling, and coordinated telephone follow-up had substantially fewer 30-day hospital readmissions, adverse drug events, and medication discrepancies than did patients who were not. Moreover, the intervention significantly increased patients' knowledge of their drugs and adherence to them in the post-discharge period.

Such results are suggestive of the benefits of the integration of clinical pharmacists within a multidisciplinary hospital discharge team (MDHDT). Pharmacist-led medication reconciliation is a practical, cost-effective, evidence-based method for making accurate medication reconciliation, avoiding preventable medication-related harm and improving the quality of medicines during the transition. Structured pharmacist-led discharge service can be broadly implemented in the tertiary care hospitals in Pakistan to enhance patient outcomes and health system utilization as well as patient safety in the health system. Additional multicenter studies with longer follow-up periods are needed to validate the results of this study and guide national health care policy on the scope of clinical pharmacy services.

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