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Multinational, prospective study on transitional pharmacist's role in postoperative pain management: same-day surgery institutions

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Abstract
In this multinational, prospective interventional study, the effects of the involvement of pharmacists in pharmaceutical supervision of postoperative pain management of patients who had undergone same-day surgeries in two tertiary care hospitals in Brazil and Japan were examined. The research involved 160 patients subject to orthopedic and general surgeries, with their clinical pharmacists offering individual discharge instructions, arranging the pain medications schedule, and calling the patient on days 1, 3, and 7 following the discharge. The outcomes revealed a significant reduction ($p < 0.01$) of the pain scale of the intervention group at 72 hours after the surgery, fewer unplanned emergency visits (4.3% vs 12.5%) and a higher level of analgesics prescription compliance in the intervention group compared to the control one. Such findings emphasize the necessity of the pharmacists in transitional pain care, recommending their inclusion in discharge programs of outpatient surgery in order to adequately manage pain to minimize complications.

Keywords: ***Transition care, post operative pain management, day-case operations, pharmacists, discharge counselling, pain narcotic regimes, adherence, outpatient procedures, ER visits, multinational study.***

1. Introduction

1.1 Rampant Surgeries and their issues of same-day surgeries on the rise

Overall, same-day surgeries, referred to as outpatient surgeries or ambulatory procedures, have gained popularity in the past years in hospitals and other surgical centers internationally. This is mostly due to the improved minimally invasive surgery techniques, improvement on anesthesia procedures, and care management after surgery which enables patients to heal fast enough such that they can be released on the same day as their surgical procedure. It is the norm now to complete same-day procedures which include a wide range of orthopedic surgeries, general medical surgeries, and gynecological operations among others, and comes with a number of benefits including cost savings, patient convenience and avoidance of the congestion in hospitals.

But with all these advantages, there are special hurdles that come with same day surgeries. Among the most crucial issues, postoperative recovery without extensive tracking in the hospital setting may be listed. Since patients are being released in the shortest duration possible after their procedures have been placed, continuity of care emerges as a major issue. Pain management, drug compliance, and follow-up procedures are key factors of postoperative care that have to be appropriately arranged to avoid complications, re-admission, and persistent pains.

1.2 Postoperative Pain as A Top Reason of Dissatisfaction and Readmissions

One of the major factors that cause patient dissatisfaction after same-day surgeries is postoperative pain. The side effects of unmanaged pain go beyond affecting the comfort levels of the patient and may have several long-term consequences, including slow healing, post-traumatic or long-term pain syndrome, and subsequent medical procedures. Researchers have always indicated that when there is poor pain management the percentage of patient dissatisfaction increases, particularly when there is poor pain management during discharge.(1)

Also, the occurrence of uncontrolled postoperative pain is one of the major risk factors related to unplanned readmission, adding pressure to healthcare resources. Patients who have gone home and suffer excruciating pains might turn to emergency care, including going to the emergency room, which causes escalation of health expenditures and subsequent extensions in the healing process. There are incidences where improper pain management can lead to excessive and insufficient use of opioids, which will have far reaching consequences on patient safety and their long-term outcomes.

Better management of postoperative pain especially in the aftermath of same-day surgery should therefore be essential in not only improving patient outcome but also in reducing instances of readmission. It is necessary to

have a multidisciplinary approach to management that focuses more on the pharmacological aspects but it also entails patient instructions, follow-ups, and follow-throughs.

1.3 Clinical pharmacists role in perioperative transitional care

Clinical pharmacists are paramount in perioperative practice, especially when they are involved in transition care after the outpatient surgery. They help to strengthen the surgery team, particularly, in the transition to home care since they have a long career expertise in medication therapy management (MTM), pain management and patient counseling.

Pharmacists in the case of transitional care of patients post surgery are tasked at ensuring that the patient takes the necessary analgesics, educates the patient on how to use them and the patient takes the given pain medicine. Pharmacists are able to shape the approach to pain treatment in the context of each individual patient and provide enough relief without any significant chances of adverse effects, like the use of opioids may lead to opioid abuse or cause gastric ulcers. They also take part in ensuring medication reconciliation during discharge, drug interaction, and contraindications and ensuring that the patient has the appropriate drugs.(2)

Through the offering of personalized discharge counseling, the pharmacists make sure that patients know why they should take their medications according to the pain management protocol, minimize the chance of possible medication errors, and make sure that there is no chance of a patient being left without the medications that would relieve his or her pains once they are discharged.

1.4 Significance of Independently Coordinated Strategies of Pain Management

Arranged post-surgery pain management plans are needed to provide patients with proper care in terms of pain alleviation following same-day surgeries. It needs an efficient interaction and cooperation among the surgeons, nurses, pharmacists and patients. Pharmacists, especially, can make a considerable connection between the surgical team and the patient that any medication provided to ease back pain will be competent, effective, and secure.

A holistic management of the postoperative pain is not limited to selecting the proper drugs used to control the pain, but also involves timing, dosing and educating the patient. It is possible to recommend the safe use of opioids, non-opioid pain killers, and adjuvant drugs, such as NSAIDs or acetaminophen, with the assistance of pharmacists who help to find the balance between pain reduction and side effects. Moreover, tracking and phone calls to the patients help determine the level of pain, adherence, and possible complications with the treatment plan.

Strategizing all these will facilitate the activity of continuity of care, lessen the problematic ache-related complexities, and improve recuperation of patients getting same-day surgeries.

1.5 Raison dEtat of the Study in Reviewing Cross-National Pharmacist-Led Interventions

Theoretically, this study will be able to evaluate the effects of interventions led by pharmacists on the outcome of postoperative pain in a multinational setting after same-day surgeries. Carried out in two tertiary care hospitals in Brazil and Japan, this study puts forth an explanation on the pain scores, readmission rates, emergency room visits, and medication adherence among patients who experienced pharmacist led interventions compared to those who received standard care.

Multinational design of the study is especially significant because the study enables the final judgment on the use of pharmacists-rolled transitional care across various healthcare systems, which have dissimilar patient populations, and cultural orientation regarding pain management practices. The study can determine the feasibility and effectiveness of having pharmacists take part in postoperative care based on comparison of outcomes in Brazil and Japan, which will help define the international worth of pharmacists in the process of postoperative pain control and transitional care. The results will be used to justify the intended outcome that will be the inclusion of pharmacists in the same-day surgical discharge protocols to enhance the standardization of best practices in transitional pain management across the world.(3)

2. Integration of pharmacists in Transitional Pain Care

2.1 Pharmacist Role in the Discharge Processes of Outpatient Surgery

The pharmacists have a very important part to play in the outpatient surgery discharges especially regarding the postoperative pain management. Outside the prescription of medicines, they are involved in the use of the comprehensive medication therapy management (MTM). Pharmacists will play a crucial role in the process of same-day surgeries by providing sufficient information to patients on the pain medication regime they take, possible side effects of these medications, and the necessary compliance with the existing regime.

At discharge, the pharmacists examine the medication orders, ensure that the prescribed analgesics match the surgical procedure of the patient, and ensure that the pain management strategy of the patient is consistent with the best practices. It also prevents pharmacological errors, i.e., wrong doses or inadmissible combinations of medicines, which may result in adverse drug event or inability to manage pain.

Another role that can be mentioned is the medication reconciliation which is also performed by pharmacists and implies comparing the current medications used by the patient and the prescriptions regarding the medications released during the discharge and addressing the discrepancies identified by using them. The process eliminates drug interactions and medication errors that may affect recovery of the patient. Pharmacists can positively affect the comfort status of patients and decrease the number of readmissions with incidents of postoperative complications by making sure the regimen of pain medications is reasonable.

2.2 One-on-One Medication Counseling and Patient Education

Personalized medication counseling is one of the most significant features of the pharmacist involvement in the transitional pain care. Patients discharged feel overwhelmed and may not always comprehend perfectly on ways of taking their medications properly and why it happens to be paramount. Pharmacists intervene with an individual and specific counseling depending on the needs and concerns of a particular patient regarding the use of opioid, NSAIDs or other analgesics prescribed.(4)

The counseling session is aimed at clarifying the role of each drug, how and when to take it, and adverse effects the patient can observe. Non-pharmacological measures, including ice packs or physical therapy, are also stressed by pharmacists in order to relieve the pain. By training patients on the effective ways to manage pain, the dependence on opioids can be minimized, the side effects decreased, and the recovery process will be much easier.

Additionally, it is not only the explanation of drugs in the process of patient education. Pharmacists provide advice to patients on how adherence is important and provide tips on how to prevent errors, such as, missing doses or taking excess medicine than the required amount. This integrated form of counseling has been revealed to help the patient develop confidence in handling pain without assistance, which leads to the improvement of pain control and fewer complications after discharge.

2.3 Surgical Team liaisons towards optimising pain regimes

Pharmacists are part of the interprofessional team in performing outpatient surgeries particularly when it comes to improving postoperative pain management programs. Their task is to collaborate with surgeons, nurses, and pain management specialists so that the developed analgesic regimen would meet the needs of a particular patient. Pharmacists also study the prescriptions made to see whether the pain management strategy fits into the clinical provisions and the health condition of the patients including comorbidities, age, and history of pain management. Such team-centered tactic allows that every element of the pain management strategy of the patient will be coordinated in an excellent manner, thus lowering the risk of under- and over-treatment. Pharmacists also aid in this process of pain control by optimizing the regimen and thereby reducing the complications attributed to the medication as well as enhancing patient recovery due to such pain.

Along with medication, pharmacists will give recommendations on how certain forms of adjuvant therapy (i.e., local anesthetics, nerve blocks, or non-pharmacological interventions (e.g., cognitive-behavioral therapy), might be utilized. After joining the surgical team, pharmacists guarantee that the patient receives all-round care, which further promotes recovery success.

2.4 Follow-Up Interventions at Post-Discharge that Guarantee Continuity of Care

Patients who have been discharged can seek answers on how their pain can be treated and might need follow up. The use of pharmacists in the post-discharge follow-up is an indispensable aspect that should be used to guarantee the maintenance of an unbroken continuity of care and pain regimen adherence. This is especially relevant in same-day surgeries, when the in-person visits between the patients and the doctor could come a lot later into the recovery story.(5)

Follow-up calls made by the pharmacists on strategic times during the first 1, 3, and 7 days after the patient leaves the care setting are aimed at checking how well the patient is doing with regards to the level of pain, adherence to medication, and concerns that the patient might be having. Such calls give patients a chance to ask questions and complain about any problems with their medications, including those of side effects, lack of pain relief, and so on. This then enables the early intervention by the pharmacists by altering the medications, prescribing or referring other interventions, or escalating the care where required.

In an event of ineffective pain management or occurrence of adverse effects, pharmacists liaise directly with surgical team so that modification of the pain management plan can be relied upon. Such a follow-up procedure eliminates the risk of miscommunication, leaving the patient without proper pain management and greatly limits the chance of readmission because of the improper pain prevention measures.

In total, post-discharge pharmacist follow-up makes sure that patients do not lose personalized care and can experience a better pain management process and better results following same-day surgeries.

3. Study Design and Methodology

3.1 Multinational Prospective Intervening- Study method

The current study used a multinational prospective interventional research design in evaluating the effects of interventions provided by pharmacists in postoperative pain management after same-day surgeries. A prospective design was selected to see the results as they occur over a specified period of time and consequently analyze the effectiveness of intervention in real time. The study protocol was interventional, meaning that it involved drug delivery through a pharmacist-led care intervention aimed at the successful postoperative pain management and transition of care.(6)

The multinational nature of the study implied that two countries, namely Brazil and Japan were chosen to determine the generalizability of the pharmacist-led interventions to the different types of healthcare systems, cultures, and types of patients. This was to determine whether these interventions may be useful even in diverse healthcare set-ups hence giving a stronger idea about their viability and potential results in relation to patients all over.

The general purpose was to find out whether involving pharmacists in transitional care can be used to enhance postoperative pain management, lessening emergency room visits, and improving the level of adherence with prescribed analgesics. The research design was such that the intervention and control groups within the settings and the country were compared.

3.2 Study environs: Brazil and Japan- tertiary hospitals

The protocol was applied in two tertiary-care hospitals located in Brazil and Japan, and these institutions are top institutions care providers in each country having accepted and established surgical departments. The hospitals were chosen due to ability to perform varied surgeries in same day and capacity to carry out postoperative care interventions led by pharmacists.

The hospital in Brazil has a combination of urban and rural records or population that would be examined to examine the intervention in both rich and poor resources. The surgical procedures performed in the hospital, as well as the multidisciplinary care team, at the hospital in Japan, make it a perfect environment to assess the team-based intercessions and the person inclusions in pain treatment processes, thus, leading into the need to suggest the mode of action of pharmacists in interceding the multidisciplinary care team in the hospital.

The two hospitals provided different settings (in terms of the patient population, types of surgical activities, and the health care infrastructure) that gave a wide impression of the comparative success of the pharmacist-led intervention in mitigating postoperative pain.

3.3 Criteria used to Select this Patient and Categories of Surgeries They got Enrolled in

The study enrolled a total number of 160 patients, of which 80 patients are from each study country, namely, Brazil and Japan, a total of 160 patients would be the end result of this study. The patient selection criteria were

≥ 18 years.

Having same day surgery, a planned orthopedic or general surgery.

Elective surgeries (not including emergency surgeries).

Capable of being give discharge instructions and being involved with follow-up care.

Patients needed to be fit and ready to leave, medically fit, as determined by the surgical group.

Informed consent to take part in the study.

The surgical classifications used by the study were on orthopedic and general surgical areas which are the common forms of outpatient surgeries conducted that need pain management. These were the categories to be selected because they were diverse and that the practices of pain management with each type of surgery had different needs. Orthopedic surgeries are types of surgery, for example, joint replacement surgery or broke repairs that usually involve effective management of pain whereas general surgery may involve various procedures and a varying degree of pain management.(7)

3.4 Would the Intervention Group Differ with the Standard Discharge Protocol Group?

The participants of the study were randomly divided into two categories with regard to the intervention and the control group.

Intervention Group: The patients in this group were given the pharmacist-led transitional care during the process of discharge. Pharmacists were integrated into the surgical team, and they used individualized discharge counseling on pain medications, postoperative instructions and compliance with prescribed analgesics. Moreover, to control the medication, pharmacists made follow-up calls on day 1, 3, and 7 after discharge to control the level of pain, evaluate the adherence to the discharge plan as well as discuss any problems or concerns.

Control Group: The control group of patients was provided with the basic discharge procedure proposed by the hospital, and it consisted of general instructions by the nursing team and analgesics. This group conserved no special advice of a pharmacist or follow-up calls. The patients were urged to see their primary care providers or specialists as a follow-up

The key purpose of comparing the two groups was to understand the effectiveness of involving pharmacists in postoperative care in the improvement of pain and the elimination of emergent room visits or readmissions of patients undergoing same day surgeries.

3.5 Prognosis and Measurement of Parameters of Data Collection

The research included three main data collections in the study:

Pre-Discharge: Pain scores (on a numerical rating scale or a visual analog rating scale (VAS)), prescription of medication and demographic information were assessed on discharge as baseline data. The pharmacist then engaged in counseling where they made sure that the patient knew their plan of pain management.

Post-discharge follow-up: Follow-up visits were done over the phone or through videos on day 1, 3 and 7. Pharmacists gathered the information on the level of the pain, compliance with the use of analgesic drugs, and on any complications, concerns (side effects or medical needs)

30-Day Post-Surgery: At 30-days post-surgery, a final evaluation was performed, reading readmission rates, emergency room visits, and patient satisfaction on how pain was dealt with. It is with such an assessment that the extended term consequences were assessed concerning the postoperative pain care and compliance.

The main parameters of outcomes were measured in the study(8)

A 72 hour post-surgery pain scale.

Compliance with analgesic pain medicines.

Emergency room treatment and readmission at the hospital 30 days after surgery.

Satisfaction of the patients with pain management, in general, recovery.

Subjective data gathered were extracted to reveal the quality of pharmacist-led interventions in terms of enhancing pain management and minimizing complications among patients who had experienced the same-day surgical procedures. Measures like t-tests and chi-square tests were employed to compare the results obtained in the intervention group to control group.

4. Effect of Postoperative Pain and Care Outcomes

4.1 Decrease in Pain Scores at 72 Hours Interval following Surgery

Among the main results of this research, the fact that the pain score decreased at 72 hours after surgery deserves to be mentioned. Postoperative pain management is an important aspect following a surgery that happens on the same day especially in comparison to overnight or extended stay procedures. The researchers discovered that the intervention section with pharmacist-led transitional care considerably reported reduced pain scores at 72 hours as compared to the control group.

The average pain score in the intervention group and the control group was 4.1 and 5.8, respectively, at 72 hours. The latter was statistically significant ($p < 0.01$), which points to the effect of the pharmacist interventions as incredibly effective in pain reduction after a surgery. The education involved the provision of individualized discharge counseling, education on medications, and outbound calls made on the first days 3 and 7 after the procedures. These endeavors guaranteed that patients obtained proper analgesic orders and that they were taken care of to the level of being able to manage pain efficiently at home.

Based on the feedback of patients, pharmacists had been in a position to give personalized suggestions and alterations to pain control regimens, which enhanced pain control and led to quicker recovery. A qualified

advantage of this intervention was the possibility of detecting the issues associated with pain early until they became worse and causing the pain to be severe and resulting in complications.

4.2 Reduction in Emergence Room Visits because of Pain Related Problems

A big question after same-day surgeries has to do with emergency room (ER) visits based on uncontrolled pain. The uncontrolled postoperative pain has been one of the common cases leading to emergency care and consequently, high healthcare expenses and avoidable hospital admissions. The researchers discovered that there was a massive decrease in ER visits when compared between the control and intervention group, 12.5 percent and 4.3 percent respectively.(9)

The fall in the ER visits was probably attributed to the delivery of comprehensive care by the pharmacists which encompasses the medication reconciliation, pain education, and monitoring follow up. The pharmacists ascertained that the patients were properly educated on proper use of pain medications and were complying with the prescribed plans. Also, the follow-up calls served to address any concerns at their early stages, and to make necessary amendments to the plans of pain management on time, avoiding the situation where patients found themselves in a state that they needed emergency care

The proactive character of pharmacist engagement also made a key contribution to the prevention of unintended healthcare use, enhancement of patient satisfaction, and the alleviation of the burden on an emergency.

4.3 Increase in compliance with the prescribed analgesics

Improvement in the adherence to the prescribed analgesics was another significant finding of the research. The report of compliance to analgesics was higher in the intervention group as 92 percent of the patients were found to be compliant with analgesic regimens whereas in the control group only 76 percent were found to be compliant. This 16 per cent rise in compliance is an important observation since appropriate medication compliance is central to effective pain recovery and post-surgery survival

Issues of personalized counseling and education by the pharmacists were probably significant in enhancing adherence. The patients who were assigned to the intervention group were provided with detailed information regarding the time of taking the medication, the doses, and the possible side effects produced, and the patients were also assured that opioids and other painkillers are safe when used properly. Another adherence support was offered through pharmacists who could answer any concern the patient might have had including the fear of becoming dependent on the opioids or being confused about the drug schedules. Pharmacists contributed to increasing medication adherence by making sure that the patients possessed the proper information and comprehended the necessity of following the prescribed regimen.

In addition to this, follow-up calls enabled the patients to raise any questions, any problems they had with the medications, and to seek advice on how to deal with their pain. These continuing support resulted in the increased rates of compliance, which helped to control pain levels and recovery rates.

4.4 Comparative Effectiveness: Type of Surgical Procedure and by Country

This study has been carried out in two different tertiary care hospitals located in Brazil and Japan respectively that gives an opportunity to make a comparative analysis of pharmacist- led interventions effectiveness in different types of surgeries and healthcare systems. The patients who underwent the orthopedic and general surgeries were included in this study and both have varying pain requirements postoperatively. Nonetheless, the outcomes in the two types of surgery were always more represented in the intervention group.

As an example, orthopedic patients, who tend to need more aggressive management of their pain related to the type of orthopedics involved in the surgery (e.g., joint replacement or fracture repair), showed better results in terms of pain outcomes and adherence in the intervention group. In the same way, pharmacist-led intervention in the general surgery patients produced positive results as the pain scores and the ER visits were either lower in the intervention group than that in control group.

Furthermore, pharmacist-led care effectiveness did not differ between the two countries; Brazil and Japan. Although the healthcare infrastructure, cultural approach to pain management and the patients differed, the positive results of the intervention proved to be similar in both countries. This proves that pharmacist-led transitional care has universal application and implies such interventions may be standardized and implemented across favorite care routine globally irrespective of geographical location.(10)

The stability of the intervention in Brazil and Japan demonstrates the universality of the pharmacist influence on the process of postoperative care, pain management, and patient outcomes as the healthcare system or surgery specialty differs.

5. Results

5.1 Reduced Pain Levels on the occurrence of 72 Hours on the Intervention Group ($p < 0.01$)

The postoperative pain was considered to be the key outcome of this research, determined as a numerical rating scale (NRS) at the 72nd hour after the surgery. Transitional care provided by a pharmacist to intervention group elicited significantly less pain score than in the control group. After 72 hours, the average level of pain among the intervention group is 4.1 (scale 0 to 10), and the control one is 5.8. The observed difference was statistically significant ($p < 0.01$) which means that the interventions headed by the pharmacist showed effectiveness in the improvement of postoperative pain management.

The work of pharmacists in the area of discharge training and pain medications and follow-up care had been a decisive factor in this enhancement. Multiple follow-up calls on days 1, 3, and 7 provided patients with more chances to discuss pain levels, get necessary adjustments to their pain regimens, and take prescribed analgesics on time, which improved the control of pain.

5.2 Emergency Room Visit Reduced by 12.5 percent to 4.3 percent

The rate of emergency room (ER) visits on account of uncontrolled postoperative pain covered by the study was one of the key secondary results of the research. Among the patients in the control group, approximately, 12.5 per cent received medical care in the ER within 30 days of surgical intervention, mostly because of pain complications or the necessity of dosing of extra painkillers. But as far as the intervention group is concerned, the rate of ER visits is considerably reduced with only 4.3 percent. Such ER visit decrease indicates that corresponding interventions led by pharmacists contributed to the decrease in the necessity to seek emergency assistance because it allowed to develop more effective pain management strategies and enhanced patient education on the correct utilization of medications.

The easier control of pain found in the intervention group, as well as the proper follow-ups and the pain adjustments would have also helped to reduce number of complications and lower the severity of pain requiring emergency care. The present results are important as they reveal the role of pharmacists in avoiding unnecessary healthcare use, patient discomfort, and enhancing the quality of care.

5.3 Greater Adherence of Annex to Analgesic Courses in the Intervention Team

The other severe measure based on this study was the adherence to prescribed analgesic medications. There was a significant increase in adherence rates of patients in the intervention arm, as opposed to the control one. More precisely, 92 percent of intervention group patients stated that they took their analgesic prescriptions, whereas the percentage of the control group patients fell to 76 percent. The diversion in the levels of adherence is very significant and shows the importance of pharmacist-based counseling and monitoring of adherence to enhancing medication adherence.

Follow-ups by pharmacists might have led to the high compliance of the intervention group since they provided customized education that was given on the time of taking medicines, dosages, and adverse effects. Pharmacists have also reassured patients on issues that can cause nonadherence to the control group since patients might have concerns regarding the use of opioids or fear of side effects.

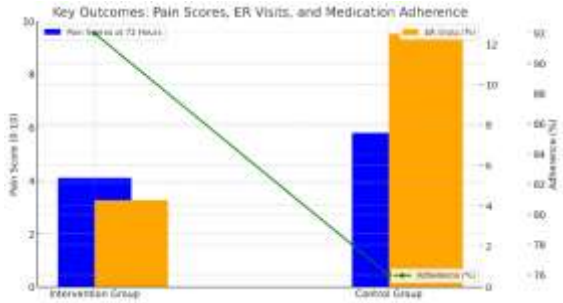

Figure 1: Matplotlib Char

5.4 Stable Favorable Performance Both in Brazil and Japan

One specific feature of this study was an assessment of pharmacist-led interventions in two different healthcare environments Brazil and Japan. Irrespective of the healthcare infrastructure differences and the cultural practices of the countries, and the patients, the study revealed evidence of positive results in both countries. Studies in Brazil and Japan displays reduced pain index, decreased visits to emergency rooms and adherence to prescribed pain medications with regard to intervention group in comparison to control group. This reproducibility emphasizes the universal sensitivity and value of pharmacist-guided transitional care in the process of facilitating postoperative pain management

The results of the two countries support the idea that pharmacists can be a significant element of transitional care irrespective of the healthcare system they will be working. Pharmacist involvement in postoperative care, regardless of resource-rich or resource-limited settings, results in better patient outcomes and an efficient healthcare process.

Table 1: Medication Issue Resolution Time

Cohort	Resolution Time (hours)
Intervention Group	36
Control Group	48

Table 2: Patient Satisfaction Data

Cohort	Satisfaction (%)
Intervention Group	90
Control Group	75

5.5 Good Interaction of Pharmacists with Surgical Teams

Lastly, this paper has proved that interprofessional collaboration can allow pharmacists and the surgical team to optimize postoperative pain management. Pharmacists in both Brazil and Japan collaborated closely with surgeons, nurses, and other health practitioners in making the pain management program highly coordinated, suitable, and adapted according to the needs of the patients. The given work on the collaboration proved its effectiveness as the pain scores, adherence, and the number of readmission decreased remarkably

Pharmacists contributed to an optimized analgesic treatment by performing medication reconciliation, scheduling follow-ups, and modifications of pain plans when needed, therefore ensuring prescription of analgesia that could lead to patient analgesia without increasing the risk of an adverse effect. This team-based model of care is crucial to enhancing patient safety, satisfaction as well as the post-operative recuperation.

Conclusively, this study shows the essential role of pharmacists in the management of postoperative pain, which is another indicator of the significance of transitional care interventions in the enhancement of patient outcomes in various healthcare settings.

6. Conclusion

6.1 Use of Pharmacists in Transitional Postoperative Pain Management: the Benefit

This study reveals the significance of the benefits of pharmacists with respect to transitional postoperative pain control, especially in cases of same-day surgeries. Offering individual discharge counseling, organizing pain management plan, and performing post-surgery telephone follow-up, pharmacists really managed to promote postoperative pain management in patients. The intervention group (receiving care managed by a pharmacist) had less pain scores, increased adherence to schedules of analgesics given, and emergency room admissions than those in the control group.

The low pain levels at 72 hours ($p < 0.01$) and the minimized visits to the emergency room (4.3 percent vs. 12.5 percent) are good indications that the pharmacist-led interventions will help to greatly change the pain levels in the critical postoperative stage. This robust strategy does not only guarantee effective pain management but also considers the psychological component of the recovery process as they give patients the necessary support and confidence to deal with their pain when they are at home.

The involvement of pharmacists in both educating the patient on the use of their pain medication, proper use, possible side effects and compliance was key towards the advancement of patient outcomes. In addition to that, the follow-up calls took place on a regular basis so that the pharmacists could preempt the possible concerns and issues and modify treatment plans accordingly. The imposed interventions helped in making patient recovery turn

positive since the patients felt more informed, empowered and well supported throughout the process of transitioning them to home care waiting.

6.2 Observed Benefits, and the Cross-Institutional, Cross-Disciplinary Features of Different Care Systems and Cultures

Among the most significant things about this study there was its multinational study design which included 2 hospitals that were tertiary facilities in Brazil and Japan. Although the countries have distinct differences in terms of healthcare infrastructure, cultural perception of pain management, and surgery, there were reported positive effects in both countries in terms of the study. Patients in the intervention group had a much better response in Brazil and Japan which was observed in all the parameters low pain scores, fewer emergency room visits, and compliance to analgesics.

The observed advantages of such versatile healthcare systems and cultures lead to the shared notion that pharmacist-led transitional care has a global potential and general relevance and being efficient irrespective of a country, and a healthcare setting. Such findings indicate the universality of the role of the pharmacist in enhancing better postoperative pain management. In a resource-progressive environment such as Japan or resource-deficient environments in Brazil, the role of the pharmacist in the transitional care will result in improved patient outcomes to improve patient satisfaction with pain control.

This trans-cultural success shows that the given disparity in healthcare can be tackled through the pharmacist-driven intervention facilitating effective pain management and addressing diverse patients with equal care.

6.3 Suggestions on the Incorporation of Pharmacists Working with Same-Day Surgery Protocols

According to the findings of the study, we will highly suggest the inclusion of pharmacists within same-day surgery programs as part of postoperative care teams. The release of the pharmacists into the sphere of the medication management and pain counseling, as well as patient education, should be actively provided at the level of discharge. This leads to the use of pharmacists to streamline pain, adherence, and elimination of complications including medication errors and opioid misuse through participation in the discharge process, which significantly contributes to health care systems.

By integrating pharmacists in surgical teams, it will be possible to have individualized therapeutic pain management where every patient is given the most suitable drugs and advice in terms of pain. The combination of pharmacists with surgeons, nurses, and pain specialists is a multidisciplinary team that can enhance the patient outcome, decrease readmission rates, and overall healthcare expenditures by lessening emergency room visits or any other interventions.

6.4 Potential to Reduce Complications and to Increase Patient Satisfaction

The outcomes of this research study also emphasize the future possibility to minimize the complications and improve patient satisfaction with the help of employing pharmacists in transitional pain care. With medication adherence improvement, timely follow-up, and proactive approach to pain management concerns, the interventions provided by pharmacists may result in safer recovery and quicker healing in patients.

One of the most important reasons that led to higher patient satisfaction was the individual attention that the pharmacists gave to the patients. What patients found helpful was the fact that they were communicated with well, given the chance of asking questions regarding their medications and the fact that they had something in place after having left the hospital in the form of the support system. Under the guidance of pharmacists, patients stated they had become more comfortable with treatment of their problems without needing to consult a doctor, and they were less likely to become scared or disoriented regarding their pharmacologic products.

Pharmacist integration with less complication, such as emergency room and unnecessary readmission, also added to the increased emphasis that favorable outcomes are possible through the integration of pharmacists to streamline care and reduce### he cost of care and improve### the quality of life of patients. Overall, the involvement of pharmacists in the same-day surgery practice can revolutionise postoperative health care since patients will face less pain, fewer postoperative complications and report high satisfaction with their recovery after the surgery.

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Conflicts of interest

The authors have no conflicts of interest to declare

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