A PROSPECTIVE CROSS SECTIONAL STUDY ON GERIATRIC PATIENTS WITH A STOPP/START BASED STRATEGIES IN POLYPHARMACY AT MULTI-SPECIALITY HOSPITAL

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Abstract

Concurrent use of numerous medications, or polypharmacy, increases the risk of adverse drug events, interactions, and decreased adherence, making it a major concern in the management of elderly patients.

Objective: The purpose of this prospective cross-sectional study was to assess the efficacy of criteria-based strategies for managing polypharmacy among elderly patients at a multispecialty hospital. The tools under consideration were the STOPP (Screening Tool of Older Persons' Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment) tools.

Methods: Geriatric patients aged 65 and above with polypharmacy, defined as using five or more medications concurrently, were included in the study. Data collection involved reviewing medical records, medication histories, and structured interviews to assess adherence and patient-reported outcomes.

Results: In a study involving 80 elderly patients taking over five oral medications, STOPP/START criteria guided comprehensive medication reviews. High polypharmacy prevalence was observed, with notable drug therapy problems including interactions and inappropriate prescriptions. Post-intervention, patients exhibited improved medication knowledge, reflecting enhanced understanding. Moreover, adherence rates significantly increased, as evidenced by Medication Adherence Rating Scale questionnaire results. This study emphasizes the crucial role of medication review interventions in optimizing therapy and improving patient outcomes in the context of polypharmacy.

Conclusions: This research adds to existing evidence supporting the utility of STOPP/START criteria in optimizing medication use and reducing polypharmacy-related risks among geriatric patients. It underscores the importance of regular medication reviews and collaborative healthcare efforts to improve medication safety and quality of care for this vulnerable population.
Keywords: Polypharmacy; Geriatric Patients; STOPP/START Criteria; Prospective Study; Multi-Specialty Hospital

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Introduction

The rising incidence of chronic illnesses and scientific discoveries in medicine have resulted in a significant increase in the quantity of drugs supplied to elderly patients, a condition called polypharmacy. Because of the increased prevalence of chronic illnesses and age-related physiological changes in the older population, polypharmacy the concurrent use of many medications is particularly common in this demographic. Pharmacotherapy is essential for treating a range of illnesses in the elderly population, but using a lot of drugs at once can have serious side effects, interactions with other drugs, medication errors, and poor medication adherence. [1]

In response to the challenges of polypharmacy, healthcare professionals have started employing screening instruments and evidence-based criteria more frequently to optimize pharmaceutical use and lower associated risks. Two of these tools have gained notoriety for their ability to identify potentially inappropriate medications (PIMs) and prescribing omissions in older patients, respectively: the Screening Tool to Alert to Right Treatment (START) criteria and the Screening Tool of Older Persons' Prescriptions (STOPP) criteria. [2]

Even while STOPP/START criteria are becoming more widely accepted, there is still a lack of empirical research assessing their efficacy in actual clinical settings, especially in the context of multispecialty hospitals. In order to fill this knowledge vacuum, a prospective cross-sectional study at a multispecialty hospital is examining the use of STOPP/START-based techniques in the management of polypharmacy among elderly patients. [3]

The desire to improve patient outcomes and optimize pharmaceutical management, especially in the elderly population where polypharmacy offers the greatest risks, drove this work. By evaluating patient-reported outcomes, identifying potentially inappropriate medication use and prescribing omissions, and prospectively assessing the prevalence of polypharmacy, this study seeks to shed light on the effectiveness of STOPP/START-based interventions in a real-world clinical setting. [4]

Moreover, the implementation of this research in a hospital with multiple specialties facilitates an all-encompassing assessment of medication practices in different medical specialties, thereby augmenting the applicability of the results. The study's conclusions ultimately have the

potential to improve drug management techniques, clinical practice standards, and the standard of care for elderly individuals with polypharmacy in a variety of healthcare settings. [5]

Subjects and methods

Study Type

The purpose of this prospective cross-sectional study is to evaluate the efficacy of STOPP/START-based therapies in the management of polypharmacy in older patients in a multispecialty hospital context. Through careful observation and data collection from a cohort of one hundred senior patients 65 years of age and above, the study aims to assess how these interventions affect prescription appropriateness, adverse drug responses, and overall patient outcomes. The study aims to provide important insights into optimizing prescription regimens for older persons. The inclusion criteria include both male and female patients who meet the requirements of having complete medical records and receiving more than five oral drugs. The study intends to guarantee a targeted analysis on the target group by excluding patients on short-duration or non-systemic drugs, as well as those who have recently undergone surgery or been admitted to the intensive care unit. In the end, the goal of this research is to minimize the dangers related to polypharmacy and provide useful evidence-based techniques to improve medication management and senior patients' quality of life. [6]

Study Site

General Medicine Department, Kovai Medical Center and Hospital, Coimbatore. A multispecialty hospital with full geriatric care services will host the trial. This hospital offers a variety of medical disciplines under one roof, creating a setting that is favorable for the potential cross-sectional inquiry. The hospital guarantees effective data gathering and patient monitoring with specialist facilities meeting the special requirements of elderly patients, including medication administration. Healthcare experts work together to execute STOPP/START-based solutions that are customized for each patient's unique profile. The hospital is the perfect location for carrying out this important research on polypharmacy management in older people because of its facilities, knowledge, and dedication to geriatric healthcare. [7]

Study Period

This study was carried out for a period of six months. This timeline makes it possible to gather a great deal of data, evaluate patients thoroughly, and carry out interventions. The longer period for longitudinal tracking of pharmaceutical outcomes and guarantees appropriate representation of a variety of patient characteristics. It also allows for any changes in a patient's response over time, allowing for thorough analysis and interpretation of the results. A balance is struck between obtaining significant data and ensuring feasibility within the hospital's operational limitations over the twelve-month study period. [8]

Study Population

Patients consulting the physician in General Medicine during the study period. The elderly patients receiving care at the multispecialty hospital who are 65 years of age or older make up the

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study population. These people show signs of polypharmacy, which is the simultaneous use of several different drugs. They reflect a wide variety of illnesses and therapy approaches. The inclusion of patients with a range of cognitive and functional capacities will reflect the complex nature of geriatric treatment in the actual world. In order to provide enough diversity for findings to be extrapolated to comparable communities, the study attempts to include a representative sample of this population. The research is more applicable and relevant to clinical practice in multispecialty hospital settings since it covers a wide range of elderly individuals. [9]

Ethics

Ethical principles guide geriatric study on polypharmacy at hospital. Patient welfare, autonomy, and confidentiality paramount. Informed consent ensures patient participation. Adherence to STOPP/START criteria minimizes risks. Results contribute to improved care for elderly population. The study protocol was approved by Institutional scientific and ethical committee (Ref No. SRC/395/2024) and ethical committee (Ref No. EC/AP/1123/02/2024). A written informed consent was taken from all the patients prior to their enrollment in the study.

Study procedure

Patients were enrolled based on inclusion criteria. During the first visit, baseline information was assessed and recorded in the data collection form. Medication reconciliation was reviewed and recommended as needed for pharmaceutical care issues. Counseling and education were provided. Patient data collection forms were documented and updated accordingly. During follow-up visit, patients were reminded of their appointment dates. Preparation for the day operations involved reviewing previous notes and the latest laboratory results. Patient records were reviewed, and medication lists/laboratory results were updated. Pharmaceutical interventions were implemented, and the pharmaceutical care plan was discussed with prescribers. Patients were informed of changes in medication and doses, and counseling and education on medication and medicine-related devices were provided. Patient records were meticulously documented and updated. The study concluded with outcome determination and the study's conclusions were drawn based on the results obtained.

Statistical Analysis

Frequency and percentages were used to summarize each of the categorical variables. Since the data did not conform to the premise of normalcy, the median was used to summarize all continuous variables (quartiles: Q1, Q3). Utilizing Shapiro-Wilk's test, the normalcy was evaluated. During the first and second visit, the continuous variables DFIT and MARS were compared using the Wilcoxon signed rank test. SPSS version 16 was used for all statistical analyses. A statistically significant p-value was defined as one that was less than 0.05. [11]

Clinical outcome measures

Medication Adherence Rating Scale (MARS):

The user-friendly Medication Adherence Rating Scale (MARS) was created by Thompson et al. to evaluate patients' adherence to their prescribed regimens. There are ten questions in all. In order to indicate how they felt about their drug, the participants were asked to check the sentence that

best reflected how they felt about it. [12]

Participants were deemed medication compliant if they answered "NO" to questions 1-6 and 9–10 and "YES" to questions 7-8 on the scale.

The assessment of medication adherence was conducted using MARS as a guidance aid. A correct response received a score of 1, while an incorrect response received a score of 0. Based on these figures, adherence can receive a maximum score of 10 or a minimum score of 0. Thus, each patient's score was determined and totaled. Patients scoring 0-3 on the adherence scale are classified as non-adherent, those scoring 4-7 are categorized as partially adherent, and individuals scoring 8-10 are considered adherent . [13]

Medication Knowledge Assessment

On the first and second visit, medication knowledge was evaluated, including Dose, Frequency, Indication, and Method of administration (DFIT). There were three categories created from the research population. Less knowledge was defined as 0–30%, moderate knowledge as 31-60%, and high knowledge as 61–100%. [14]

START Criteria

The START tool serves as a guide to help identify pharmaceutical care difficulties during the pharmacotherapy screening process. The START tool tackles problems with inappropriate prescribing, which includes both prescribing and not prescribing pharmacological therapy. [15]

STOPP Criteria

This tool serves as a guide to help identify pharmaceutical care difficulties during the pharmacotherapy screening process. The STOP tool tackles concerns about commonly used medications for treating chronic diseases, some of which may not be appropriate for a certain patient's condition or may even make it worse. [16]

Results

Demographics of the Study Population

Of the participants in our study, 75.7% (n = 53) were men, a higher percentage than the 24.3% (n = 17) who were women. In terms of allergy, 100% (n=70) patients don’t have any allergies reported before or after hospitalization.

Table 1: Distribution of Patients based on Demographic Variables (n=80)

Demographic Variables	Categories	Frequency	Percentage (%)
Gender	Male	46	57.5%
	Female	34	42.5%
Allergy	No	78	97.5%
	Yes	2	2.5%

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Clinical Presentation

Table 2: Distribution of Patients based on number of Diagnosis and Medications (n=80)

Variables	Categories	Frequency	Percentage (%)
Diagnosis	2	31	38.8%
	3	30	37.5%
	4	10	12.5%
	5	7	8.8%
	6	2	2.5%
Medications	5	24	30.1%
	6	18	22.6%
	7	23	28.8%
	8	8	10.0%
	9	3	3.8%
	10	4	5.0%

In the study population, 38.8% had two diagnoses, 37.5% had three, 12.5% had four, 8.8% had five, and 2.5% had six diagnoses simultaneously. The most prevalent category was individuals with two diagnoses, followed by three, four, five, and six. These findings underscore the high prevalence of multiple diagnoses among older adults, contributing to the risk of polypharmacy. [17] Approximately 30.1% of patients received five prescriptions, followed by 28.8% with seven, and 22.6% with six prescriptions. Ten percent received eight, 5.0% received five, and 3.8% received nine prescriptions. Currently, four patients exhibit both polypharmacy and excessive polypharmacy. These findings highlight varying levels of medication burden among the study population, with some individuals experiencing high prescription volumes [18]

START Criteria

The START criteria were used to analyze the prescriptions and medications consumed by the study populations' patients. Multiple START issues were found. About 2.3% (n=2) of prescriptions during the initial visit had two START mistakes, whereas 1.3% (n=1) of patients had just one START error. In 96.3% of the patients (n=77), there were no START mistakes recorded. By the time the trial ended, 1.3% (n=1) of patient prescriptions had START mistakes, whereas 98.8% (n=79) of the prescriptions had no issues. The decrease of START mistakes, however, was not statistically significant. [19

STOPP Criteria

Multiple STOPP errors were discovered when the study population was assessed utilizing STOPP criteria during the first and second visits. While 92.5% of the patients (n=74) had no STOPP problems, about 7.5% (n=6) of the patients' prescriptions had errors on the first visit. However, on the second visit, just 1.3% (n=1) of the patients made STOPP errors, indicating a decline in the percentage of these errors. The results showed statistical significance. [20]

Variables	Median	Q_1	Q_3	Sample size(n)	Z statistic	p-value
MARS VISIT 1	5	4	8	80		
MARS VISIT 2	9	9	9	80	7.86	<0.001*
DFIT VISIT 1	25	20	30	80		
DFIT VISIT 2	85	80	89	80	7.81	<0.001*

Table 3: Medication adherence and medication knowledge (n=80)
*P value <0.05 considered to be statistically significant
MARS: Medication Adherence Rating Scale
DFIT: Dose, Frequency, Indication and Method of Administration

Initially, 88.9% of patients had limited drug knowledge, while 11.3% had some understanding. None had high expertise. By the trial's end, 95% demonstrated good medicine knowledge, with only 5% retaining limited understanding. Notably, no patients exhibited poor knowledge. The significant increase in DFIT scores indicates improved drug comprehension post-intervention, emphasizing the effectiveness of the educational component in enhancing patients' understanding of their medications. [21]
Initially, 7.5% of patients were non-adherent, 41.3% were adherent, and 51.3% were moderately adherent. By the trial's end, 81.3% were adherent, while 18.8% were moderately adherent. Notably, there were no non-adherent patients at the follow-up visit. The MARS score significantly increased both before and after the trial, indicating improved medication adherence among the study population. [22]

Discussion:
Polypharmacy is a growing concern worldwide, particularly among older adults with multiple chronic conditions. In this study, the prevalence of polypharmacy was notable, with the majority of patients experiencing two or more illnesses concurrently, leading to the potential for excessive polypharmacy. The explicit criteria STOPP/START facilitated medication review, revealing drug therapy issues such as drug interactions and duplicate therapy, common culprits of adverse drug reactions. These findings align with existing literature, indicating the relevance of STOPP/START criteria in identifying and addressing medication-related problems.
The primary outcome measures of the study highlight the success of STOPP/START-based medication reviews in identifying and addressing drug therapy problems, ultimately leading to

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improved therapeutic outcomes. Additionally, the secondary outcome measures emphasize the significant improvement in medication adherence following pharmaceutical care interventions. These findings underscore the crucial role of clinical pharmacists in optimizing medication management and enhancing patient outcomes in geriatric populations.

Regarding the STOPP/START-based interventions, the study demonstrated significant improvements. There was a substantial decrease in both STOPP and START errors between the initial and follow-up visits, highlighting the effectiveness of pharmaceutical care interventions in optimizing medication appropriateness and reducing the risk of adverse events. Notably, the proportion of patients with STOPP errors decreased from 7.5% to 1.3%, consistent with previous research, indicating a notable decline in medication-related issues over the course of the trial.

Patient education played a crucial role in improving medication understanding and adherence. At the outset, the majority of patients had limited knowledge about their medications, but by the end of the trial, 95% demonstrated good medicine knowledge. This significant increase in medication understanding corresponded with improved adherence, with 81.3% of patients classified as adherent at the study's conclusion. The correlation between patient education, medication understanding, and adherence underscores the importance of comprehensive pharmaceutical care interventions in enhancing therapeutic outcomes for geriatric patients.

Overall, the study provides valuable insights into the effectiveness of pharmaceutical care interventions in addressing polypharmacy and improving medication-related outcomes among older adults. The numerical values presented in the study demonstrate the tangible impact of these interventions on reducing medication-related issues and enhancing medication adherence, ultimately contributing to improved quality of care for geriatric patients.

One significant limitation of our study is its restriction to a single healthcare facility or region, which may restrict the generalizability of our findings to the broader geriatric population in India. Multicenter studies encompassing participants from diverse regions and socioeconomic backgrounds are necessary to validate the applicability of start/stop criteria in varied healthcare settings across the country. Additionally, the cultural context and healthcare infrastructure in India may present unique challenges to implementing and adhering to start/stop criteria among geriatric patients. Factors such as polypharmacy, medication affordability, and healthcare access could influence prescribing practices and medication management, necessitating further investigation into their impact on the applicability of start/stop criteria in the Indian context.

In conclusion, the implementation of the START and STOPP tools represents a significant stride forward in optimizing medication therapy and improving health outcomes among geriatric populations. Our report has underscored the importance of these tools in identifying potentially inappropriate medications and opportunities for appropriate medication initiation in older patients. While the START tool effectively identified medication discrepancies, statistical significance was not achieved despite a notable decrease in errors, indicating potential for further research. Conversely, the STOPP tool demonstrated efficacy in minimizing medication-related risks, with a significant reduction in errors observed. Integral to the success of these tools is the crucial role of

pharmacists, whose specialized knowledge and collaborative involvement ensure comprehensive medication management tailored to the unique needs of older patients. Advocating for the integration of START and STOPP tools into geriatric care practices is essential, as they offer valuable strategies for promoting rational medication use and enhancing patient safety. By harnessing the expertise of pharmacists and prioritizing evidence-based interventions, healthcare providers can optimize medication therapy, improve patient outcomes, and foster healthier aging for older adults.

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