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Assessment of Documented Pharmacists Interventions Across Secondary Healthcare Facilities in FCT, Abuja, Nigeria: A Retrospective Study

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ABSTRACT

Background: Pharmacists play a vital role in ensuring medication safety through their practice of pharmaceutical care. Prescription writing is the responsibility of the prescriber which provides information about medication use to a patient. Errors from Outpatient prescription can pose a significant challenge to patient safety and well-being.
Objective: To assess Pharmacists interventions on documented outpatient prescription errors across selected Secondary Healthcare facilities in Abuja, Nigeria.
Methods: The study was a cross sectional descriptive study carried out retrospectively on prescription errors intervened by the Pharmacists in the Outpatient pharmacies of nine Federal Capital Territory (FCT) Secondary Healthcare Facilities between 2018 and 2022. Systematic random sampling and simple random sampling techniques were used. Data were analyzed using IBM Statistical Package for Social Sciences (SPSS) version 29.0. Both descriptive and inferential statistics were presented in tables and figures. Similarly, Chi square test was used to analyze the association between the variables, and $p<0.05$ was stated as statistically significant.
Results: Two hundred and ten (210) interventions were analyzed. Adult patients outnumbered pediatric patients, accounting for more than 75.7% of the documented interventions. On the other hand, 50.0% of the sample population were adult females while participants with weight greater than 55Kg were the majority. Furthermore, the interventions that had more than one medical condition (36%) were frequently intervened while overdosage with (26%) was the highest prescription errors encountered whereas 85.3% of consequences of non-intervention were found to be severe. Similarly, there was an association between category of prescription errors and patients age, sex, Pharmacist intervention and consequences of not intervening ($p<0.001$).
Conclusion: Pharmacists intervention is essential in preventing prescription error from reaching the patient.

1. Introduction

Pharmaceutical care is the pharmacist's contribution to the care of individuals to optimize medicine use and improve health outcomes[1]. Pharmaceutical care is a patient-centered, outcome-oriented pharmacy practice that aims to optimize the patients' health-related[2]. To ensure that patients receive the most efficient and safe treatments possible, Pharmacists, who are specialists in medications, play a critical role in preventing, detecting, and resolving medication-related concerns [3]. In addition to the other services that Pharmacists provide, the level of interventions that Pharmacists make to prevent medication errors is always a good way to determine their effectiveness in optimizing drug therapy and medication management from the perspectives of patient safety and quality of care[3]. Consequently, their interventions are aimed at improving patient outcomes, minimizing adverse drug events, enhancing medication adherence, and promoting overall

health and well-being[2]. Additionally, treatments are intended to enhance medication adherence, promote general health and well-being, reduce adverse drug events, and improve patient outcomes [4].

Furthermore, prescription errors are the most common sort of preventable drug errors, and they have a significant incidence that needs to be reduced [5]. Available statistics demonstrate that between 30% and 70% of prescription ordering errors are caught by nurses and Pharmacists [6]. Drug therapy errors are a widespread issue, but for the most part, the issue may be avoided [7].

Nigeria's capital Abuja is home to a network of secondary Healthcare institutions that meet the demands of a sizable population. Since outpatient prescriptions are frequently written in these settings, it is crucial to investigate the prevalence of prescription errors and the corrective measures taken in Secondary Healthcare Facilities throughout Abuja[8].

An essential component of patient care and a gauge of the level of care delivered is the evaluation of drug prescription patterns[9], Outpatient prescription errors pose a significant challenge to patient safety and well-being[10].

Prescription errors in outpatient settings have gained recognition as a critical Healthcare concern globally. Despite significant advancements in medical technology and increased awareness about patient safety, such errors continue to persist [11]. Theories of human errors which concluded that errors are mainly mistakes that is an unintended action that goes wrong with the underlying contributing factors of stress, fatigue, high workload, lack of experience, training, and poor communication [11]. During the ordering or prescribing process, medication errors are most frequent. The wrong drug, the incorrect route, dose, or frequency are examples of common mistakes made by healthcare professionals [12]. Therefore, this study was aimed at retrospectively assessing documented Pharmacists intervention across selected Secondary Healthcare Facilities in Abuja, Nigeria.

2. Methods

This study is a cross sectional descriptive retrospective study that was carried out on prescription errors intervened by the Pharmacists before the medication was dispensed to the patients. Interventions made were documented using a checklist designed by the pharmaceutical care team. The research was carried out in the Outpatient Pharmacies of the nine selected Secondary Healthcare Facilities across the Federal Capital Territory, Abuja.

All patients who visited the outpatient pharmacies of these facilities and obtained medication during the period of the study from January 2018 to December 2022 were considered for the study. The sampling technique employed was the systematic sampling technique which was used for the selection of the documented prescription sheets that were to be analyzed. The documented prescriptions errors between 2018 and 2022 were considered and selection was done using the simple random sampling method to determine a particular year as the sample size.

The sample size included all outpatients of all ages whose prescription errors were intervened and documented by Pharmacists for the particular year of study. All outpatient prescriptions with errors detected, intervened, and documented on the particular year of study were considered. Hence, the year 2022 was the year selected for the study.

All Patients from the inpatient setting or those in an outpatient setting without errors or with incomplete reported Prescription errors and Pharmacists interventions were excluded. A questionnaire was self-designed on Google form and divided into sections using questions from a checklist designed by the pharmaceutical care unit. Data were collected using the direct reporting technique in which an error detected during screening and validation is immediately reported, intervention were properly documented by the Pharmacists using a checklist and documented forms were then forwarded to the research team for data collection.

Ethical Approval was sought from Federal Capital Territory Administration Ethics and Research Committee **FHREC/2023/01/191/06-09-23** and Data were analyzed using IBM Statistical package for social sciences (SPSS) version 29.0. Both descriptive and inferential statistics were presented in tables and figures. For categorical variables, the chi square test was used to investigate the association between the variables, and $p<0.05$ was stated as statistically significant.

3. RESULTS

3.1 Healthcare Facilities

A total of 210 entries were recorded as Pharmacists interventions across nine secondary Healthcare facilities in Abuja in the Year 2022 (Figure 1).This include Healthcare Facility (1) (19.52%), Healthcare Facility(2)(14.76%), Healthcare Facility (3) (10.95%), Healthcare Facility(4) (11.90%) , Healthcare Facility (5) (4.29%), Healthcare Facility (6)(7.62%), Healthcare Facility (7)(20.00%),

Healthcare Facility (8) (4.76%) and Healthcare Facility(9)(6.19%) (Figure 1).

3.2 Social Demographic Factors

The adult patients outnumbered pediatric patients, accounting for more than 75.7% of the documented interventions. Fifty (50.0%) of the sample population are adult females. The participants with weight greater than 55kg are the majority while 96.7% of participants neither smoke nor drink alcohol (Table 1).

3.3 Frequently Encountered Medical Conditions

Interventions with more than one medical condition had the highest prescription errors (36%), followed by Malaria (31%) and hypertension (21%). Furthermore, peptic ulcer disease, respiratory tract infection and urinary tract infections were medical conditions that were also seen to be frequently encountered during interventions (Table 2).

3.4 Categorization of Prescription Errors

Prescription interventions with overdose had the highest frequency (26.1%) followed by prescribing without indication (22.9%) and sub therapeutic dose or duration (20.9%) (Figure 3).

3.5 Outcome of Intervention

The prevention of complication was the outcome of intervention having the highest frequency of 139 out of 210 prescription interventions which corresponds to 66.2% (Table 2). The other variables like prevention of mortality (13.3%), rationalization of drug therapy (5.7%) and reduction of cost (0.5%) (Table 3).

3.6 Consequences of not Intervening

The highest cosequence of non-intervention was severe/ life threatening (85.3%) the moderate (9.48%) while the lowest was mild (4.74%).

3.7 Acceptance or rejection of intervention by prescriber

100% of documented interventions were accepted by the prescribers (Table 4).

3.8 Association of prescription error with different variables

The chi square test yielded a small p-value(p<0.001) which means that there is strong evidence against the null hypothesis and may conclude that there is possible association between category of prescription errors and the age, sex, pharmacist intervention and consequences of not intervening (Table 5).

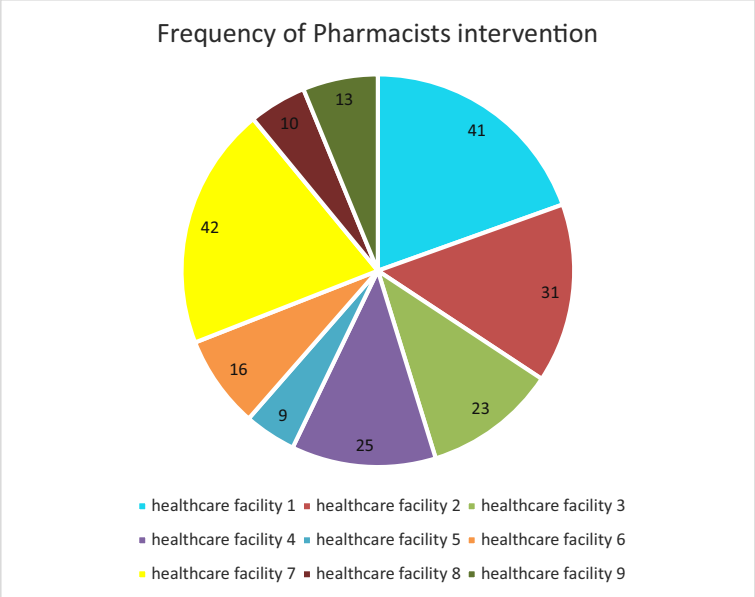

Figure 1: Frequency of Pharmacists interventions in FCT Secondary Healthcare Facilities

Table 1: Patients' socio-demographic factors

Variable	Parameter	Frequency(n=210)	Percentage
Patients age	Child	49	23.3
	Adult	159	75.7
	Blank	2	1.0
Patients Sex	Adult Male	55	26.2
	Adult Female	105	50.0
	Pediatric Male	25	11.9
	Pediatric Female	20	9.5
	Blank	5	2.4
Patients weight	<5kg	4	1.9
	5-15kg	15	7.1
	16-25kg	9	4.3
	26-35kg	5	2.4
	36-45kg	2	1.0
	46-55kg	7	3.3
	>55kg	138	65.7
	Blank	30	14.3
Social history of patients	Smoking	1	0.5
	Drinking	1	0.5
	Nill	203	96.7
	Both	1	0.5
	Blank	4	1.9

Table 2: Medical conditions frequently encountered in some facilities in the Federal Capital Territory (FCT) Abuja

Variable	Frequency	Percentage (%)
More than one	36	17.1
Malaria	31	14.8
Hypertension	21	10.0
Respiratory tract infection	20	9.5
Peptic ulcer disease	18	8.6
HIV	13	6.2
Urinary tract infection	10	4.8
Pain	8	3.8

Gasto – intestinal infections	6	2.9
Blank	6	2.9
Allery	5	2.4
More than 2 infections	5	2.4
Sepsis	3	1.4
Sickle cell	3	1.4
Ear, nose & throat	3	1.4
Psychosis	3	1.4
Diabetes	3	1.4
Hypertension and Diabetes	2	1.0
Pelvic inflammatory disease	2	1.0
Wounds	1	0.5
Skin infection	1	0.5
Viral infection	1	0.5
Infertility	1	0.5
More than 3	1	0.5
Typhoid fever	1	0.5
Mania	1	0.5
Burns	1	0.5
Post partum hemorrhage	1	0.5
Pregnancy	1	0.5
Eye infection	1	0.5

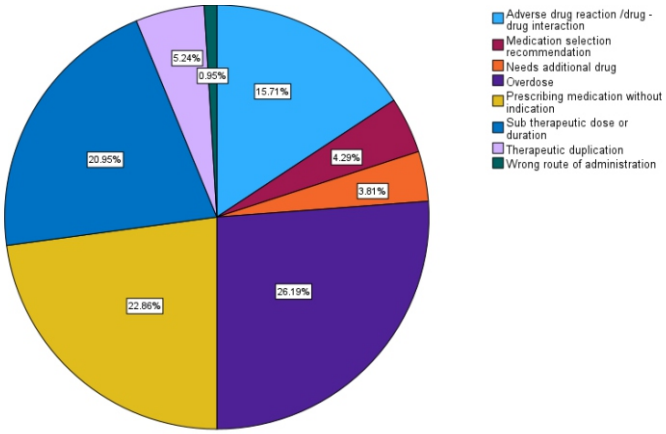

Figure 2: Categorization of prescription errors

Table 3: Outcome of intervention

Variables	frequency	Perecentage (%)
Outcomes		
Prevention of complication	139	66.2
Blank	30	14.3
Prevention of mortality	28	13.3
Rationalisation of drug therapy	12	5.7
Reduction of cost	1	0.5
If more than one outcome		
Prevention of complication and mortality	10	4.8
Prevention of complication and reduction of cost	9	4.3
Prevention of complication and rationalisation of drug therapy	6	2.9
Prevention of mortality and reduction of cost	3	1.4
Prevention of complications/mortality and reduction of cost	3	1.4
Blank	179	85.2

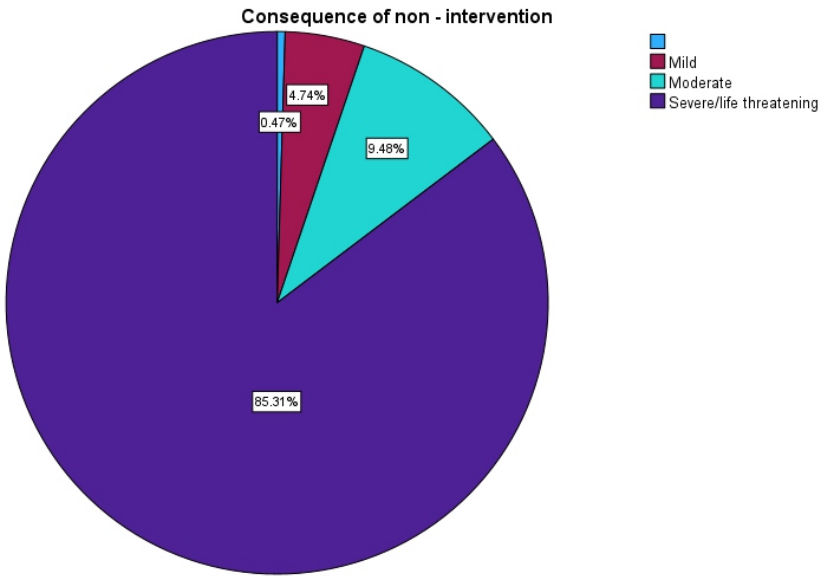

Figure 3: Consequences of non-intervention.

Table 4: Acceptance or rejected by the Prescriber

Variable	Frequency(N)	Percentage (%)
Accepted	210	100.0
Rejected	0	0

Table 5: Association of prescription error with different variables

Variable	Prescription errors N (%)	p-value
Sex		
Adult Male	55(26.8)	
Adult Female	105(51.2)	
Pediatric Male	25(12.2)	
Pediatric Female	20(9.8)	<0.001
Age	49(23.3)	
Male	162(77.1)	<0.001
Female	2(0.9)	
Pharmacists' interventions in hospitals		
Healthcare Facility 1	41(19.5)	
Healthcare Facility 2	31(14.8)	
Healthcare Facility 3	23(11.0	
Healthcare Facility 4	25(11.9)	
Healthcare Facility 5	9(4.3)	<0.001
Healthcare Facility 6	16(7.6)	
Healthcare Facility 7	42(20.0)	
Healthcare Facility 8	10(4.8)	
Healthcare Facility 9	13(6.2)	
Consequences of not intervening		
Severe/life-threatening	180(85.7)	
Moderate	10(4.8)	
Mild	20(9.5)	<0.001

4. Discussion

The study "Assessment of Documented Pharmacists Interventions across Secondary Healthcare Facilities in FCT, Abuja, Nigeria: A retrospective study" comprehensively evaluated Pharmacists' roles in secondary Healthcare facilities in the Federal Capital Territory. It examined the frequency, impact, and influencing factors of Pharmacist interventions. Pharmaceutical care is crucial for effective medication therapy and patient safety, addressing various aspects from medication reviews to prescription error resolution. The assessment explored Facility distribution, patient demographics, prevalent medical conditions, and prescription error categories. It also assessed intervention outcomes, highlighting prevention and cost-effectiveness. The study also underscores the vital role of Pharmacists in patient well-being and examines collaboration between Pharmacists and Prescribers in Healthcare settings. The distribution of Pharmacist interventions across different Healthcare facilities provides valuable information about the demand for pharmaceutical services in various locations within Abuja. Our present study noted that, the distribution of pharmacist interventions varies among facilities, with Healthcare Facility (7) having the highest percentage, followed closely by Healthcare Facility (1). Conversely, Healthcare Facility (5) has the lowest percentage. These variations suggest differing needs for pharmaceutical interventions across facilities, with higher percentages possibly indicating greater demand for Pharmacist expertise. Recognizing and understanding these variations is vital for effective resource allocation, targeted interventions, and collaborative efforts among healthcare professionals to enhance pharmaceutical care quality across the diverse landscape of Abuja's secondary Healthcare facilities. Previous studies on Healthcare Facility distribution showed similar findings, emphasizing the importance of equitable access to healthcare services [14]. Comparing these results with previous studies helped identify trends in the utilization of healthcare facilities and the need for resources in specific areas.

The present study shows that adult patients constitute the highest number of interventions, emphasizing a focus on the adult population in pharmaceutical care. The gender distribution, with more than half being adult females, is noteworthy for tailoring interventions based on gender-specific health needs. Additionally, most participants have a weight exceeding fifty-five (55) kilograms, influencing dosage calculations and medication management. Lifestyle factors, such as not smoking or drinking alcohol (ninety-six percent), played a crucial role in pharmaceutical care interventions, guiding Pharmacists in providing personalized advice and monitoring based on patients' lifestyle choices. Overall, understanding these demographics and lifestyle aspects is essential for healthcare professionals to optimize pharmaceutical care and improve patient outcomes. Previous studies on patient demographics have shown variations based on geographical location, time, and Healthcare systems[15]. The present findings can help to identify changes in patient demographics and inform Healthcare planning and resource allocation.

Furthermore, the findings emphasized the correlation between prescription errors and various medical conditions. The highest prescription error rate was associated with interventions involving more than one medical condition, indicating that the complexity of managing multiple conditions may contribute to errors. However, specific conditions, such as Malaria and Hypertension, contribute significantly to prescription errors with (P<0.001), emphasizing the need for careful consideration in disease-specific prescriptions. Additionally, frequently encountered conditions like peptic ulcer disease, respiratory tract infection, and urinary tract infections were highlighted, guiding Healthcare providers in addressing common Healthcare needs. The findings also underscore the importance of tailoring pharmaceutical care interventions based on the complexity of medical conditions, urging heightened pharmacovigilance, precision, and enhancing preparedness for managing prevalent conditions during interventions. Previous studies on prescription errors and medical conditions have shown similar patterns, highlighting areas where Healthcare professionals need additional training or decision support tools [16]. These findings will help in developing targeted interventions to reduce prescription errors for specific medical conditions.

The categorization of prescription errors provides insights into the types of errors that occur most frequently. This information discusses key patterns in prescription interventions, focusing on different types of prescription issues. In the present study, prescription interventions with overdose were the most frequently encountered, indicating a significant portion of cases where medication dosages exceeded recommended levels, posing risks to patient safety. Prescribing without indication, highlights instances

where medications were prescribed without clear medical reasons, leading to potential side effects and increased costs. Subtherapeutic doses or duration interventions, suggest cases where medications were prescribed at insufficient levels or for inadequate durations, compromising treatment effectiveness. Addressing these issues requires careful monitoring, adherence to guidelines, and individualized consideration of dosage and duration for optimal patient outcomes. This corroborates the studies carried out in Netherlands[17] in southwest Nigeria[18].

The outcomes of Pharmacists interventions, particularly the prevention of complications, are important for assessing the impact of these interventions or otherwise on patient care. The findings highlight the diverse goals achieved by Healthcare providers and Pharmacists through prescription interventions. The primary emphasis on preventing complications and mortality underscores their crucial role in improving patient outcomes and ensuring safety. Additionally, efforts to rationalize drug therapy and reduce costs reflect the commitment to optimizing Healthcare resources and enhancing the overall quality and efficiency of healthcare delivery. Previous studies on Pharmacist interventions have shown similar outcomes, emphasizing their role in improving patient safety [18]. These findings corroborate the effectiveness of Pharmacists interventions in different settings.

The consequences of not intervening highlights the potential risks associated with prescription errors. This agrees with the findings of other researchers which underscores the importance of error prevention thereby providing insights into the persistence of certain risks and the need for targeted interventions [19].

The high acceptance rate of Pharmacists interventions is a positive outcome which indicates a successful collaboration between Pharmacists and prescribers. This is linked to good communication skills and clinical knowledge by Pharmacists.

The strong evidence of an association between prescription errors and various variables is a significant finding (P<0.001). The study showed an association between category of prescription errors and the gender, pharmacist intervention and consequences of not intervening this corroborates previous studies on prescription errors that have explored similar associations [20,21,22] This confirms the consistency of these relationships across contexts thus guiding interventions aimed at reducing prescription errors from reaching the patient.

5. Conclusion

This Study demonstrates the pivotal role Pharmacists play in enhancing patient care, medication safety, and clinical outcomes. Thus, Pharmacists intervention is essential in preventing prescription error from reaching the patient. The study also provided valuable insights into the Healthcare system's effectiveness and points toward opportunities for a strengthened collaboration of Pharmacists with other members of the Healthcare team. The study's findings can guide Healthcare policies and practices to optimize the role of Pharmacists in providing a quality patient care in FCT and can also serve as a model of practice for other states in Nigeria and other Countries Worldwide.

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