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RESEARCH ARTICLE

Pharmaceutical care performance of community pharmacies in a state in Nigeria before and after implementation of an educational intervention

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ABSTRACT

Background: There have been inconsistencies in the practice of pharmaceutical care despite several years of its inception. There is need to assess pharmaceutical care performed in community pharmacies in Nigeria. This study therefore aimed to assess the level of pharmaceutical care performance in community pharmacies in a state in Nigeria before and after the implementation of educational intervention. **Methods:** The study used a pre-and post-study design conducted in forty community pharmacies in Anambra State. The level of pharmaceutical care performed in the community pharmacies was determined using a 24-item validated quality indicator assessed through simulated patients and an audit on the randomly selected community pharmacies. An educational intervention was developed and implemented to improve areas the community pharmacies performed poorly in rendering pharmaceutical care. Data collected were summarized using a frequency (percentage), mean, median, and mode. McNemar's test was used to compare the significant differences between the pre-and post-performance scores of the community pharmacies. A significant value of $P < 0.05$ was employed. **Results:** The pre-assessment level revealed areas of poor performance by the pharmacists mostly in the documentation of pharmaceutical care activities; follow-up and referral of patients. Educational intervention targeted to improve areas community pharmacists perform poorly in rendering pharmaceutical care. The post-assessment resulted in significant improvement in pharmaceutical care with composite performance scores of 0.48 at pre-study and 0.61 at post-study. **Conclusions:** Community pharmacists in Anambra state have poor performance of pharmaceutical care. Continuous assessment of the community pharmacists is essential to sustain and improve pharmaceutical care performance.

Keywords: Community pharmacists, Performance, Pharmaceutical care, Quality indicator, Simulated patients, Educational intervention

INTRODUCTION

The essence of pharmaceutical care is to ensure that pharmacists take maximum responsibility for their patients' drug therapy needs not only to dispense medications.[1] Pharmacists should be involved in the identification of drug therapy problems, health promotion, provision of drug information, disease management, medication review, provision of non-prescription drugs, and in the participation of the therapeutic decisions of their patients. The pharmacy profession cannot progress if pharmacists continue in their usual act of preparing, dispensing, and selling medications. In the Nigerian healthcare system, pharmaceutical care is considered a model that needs to be implemented.

Community pharmacists are the most accessible healthcare professionals and this positions them

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to have regular contact with their patients. They are the first and in most cases the last contact for most patients. Community pharmacists delivering pharmaceutical care is not new but certain barriers have limited their performance of pharmaceutical care.[2] Quality indicators are elements of practice performance that can be measured, with a consensus that it can be used to assess the quality of care provided thus bringing about change in the quality of care provided.[3] They reveal the extent to which performance of care is provided, and they are used to bring about improvement in patient care.[4] Quality indicators can be classified as either structural indicators; process indicators or outcome indicators.[3,5] Quality indicators should have qualities such as their ability to measure, their importance and use, validity, and reliability.

The simulated patient method is a hidden method of observing actual responses in a natural environment, under conditions that are not influenced by the knowledge that such behavior is being monitored.[6] This technique is widely used in the community pharmacy setting and it's an effective means of obtaining valid outcomes that may be challenging to obtain using other means. The feedback provided to pharmacists after a simulated patient visit is very important and it allows for the gradual transformation of practice behavior over time which is an important aspect of the simulated patient study.[6] Lack of standards to guide pharmacists in their daily practice has been identified as the main setback in pharmaceutical care practice. For pharmaceutical care to be fully implemented in community pharmacies in Nigeria, quality indicators must be clearly defined and fully established for use and activities of community pharmacists periodically evaluated to determine the level of performance. This study, therefore, aimed to assess the level of pharmaceutical care performance in community pharmacies in Awka using validated quality indicators.[7]

METHODS

The study protocol was approved by the Ethics Committee of the Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Awka Anambra State, Nigeria. The participating community pharmacists gave written consent to participate in the study. The study was conducted from April 2019 to February 2020.

Study design

The level of pharmaceutical care performed within community pharmacies in Anambra state was determined using pre-and post-test.

Sampling and sampling technique

The sample size was calculated based on population size using a sample size calculator for designing clinical research (before after study) by the University of California San Fransisco. A group size of 34 was calculated as adequate for the study. Given possible attrition from the study, another 6 pharmacies were added to the number to make it up to 40. The population frame was 60 community pharmacists in Anambra state that met the inclusion criteria. Community pharmacies that participated in this study were randomly selected. The inclusion criteria include community pharmacists registered with the Pharmacists Council of Nigeria for the study year and those that gave their informed consent to participate in the study. Community pharmacists registered in Anambra state but have not practised for more than one year were excluded from the study. Out of the 60 community pharmacists, 40 participated fully in the study. Twelve (12) of the pharmacists did not complete in the pre-assessment study, and 8 of the pharmacists did not fully participate in the educational intervention study. The sample size used in this study was 40 community pharmacists.

Data collection

Twenty-four itemed validated quality indicator[7] assessed using simulated patients and audit of some other activities of the community pharmacists was used as an instrument for the data collection on the level of pharmaceutical care performed in the community pharmacies in Anambra State. A schematic representation of the method of data collection is shown in Figure 1.

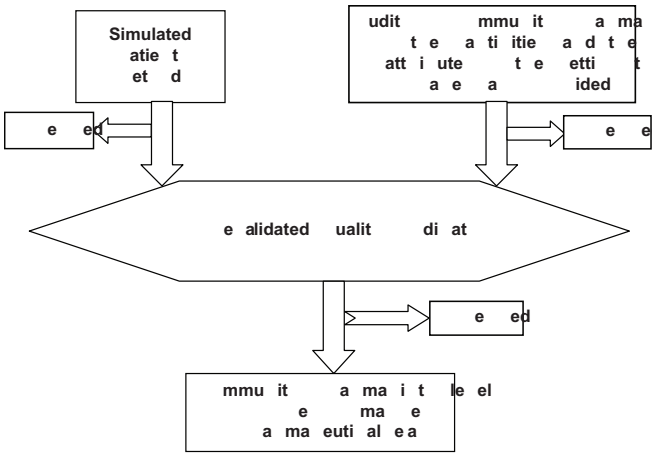

Figure 1: Schematic representation of method of data collection for the pre-and post-assessment of pharmaceutical care performance in the community pharmacies

Pre-and post-test study

Four undergraduate students (2 men and 2 women) were recruited and trained intensively for 2 weeks to act as simulated patients. The training was done by the researcher. The training concentrated mainly on the ability to carry out a role with consistency and adequate concentration and being able to repeat a role with sustained concentration. The training also stressed how to respond to differences in scenarios appropriately. Four scenarios were employed by the simulated patients to obtain information on the level of performance of the pharmaceutical care by the community pharmacists. Every participating pharmacy was scheduled to receive 2 scenarios. The simulated patients were selected in such a way that no simulated patient visited any of the pharmacies more than once for each scenario. This was to prevent the fatigue that can arise when one undertakes the same role continuously over a long period. The simulated patients were trained to always complete the evaluation form immediately after they come out of the pharmacies "in character," and this was stressed throughout the study to avoid introducing bias in the study. After the completion of each visit, the simulated patients were paid the agreed fee for acting. Details of the scenarios and activities are shown in Table 1.

The pre-and post-assessment audit was carried out at the participating pharmacies by the researcher on some other activities of community pharmacists and the attributes of the setting in which the care was provided. The average time for each audit was 30–45 min. The audit of other activities of the community pharmacists is shown in Table 2.

Educational intervention which was developed as a "Pharmaceutical care lecture module for community pharmacists in Anambra state" was used in training the community pharmacists as shown in Appendix 1. The intervention lasted for five months and within the period; the researcher had contact with each of the community pharmacists twice. The mode of interaction was purely interactive and self-directed. The essence of pharmaceutical care practice and the need for documentation of pharmaceutical care activities in community pharmacies were emphasized throughout the interactive session. Developing a format for documentation of pharmaceutical care activities in the community pharmacies was considered necessary at the end of the session.

Method of data analysis

Responses from the pre-and post-intervention study were analyzed using Statistical Package for Social Science Students Version 23 software package. Data collected were summarized using descriptive statistics: Frequency distribution table (%). The significant differences between the community pharmacists pre-and post-performance scores were compared using McNemar's test. All significant statistics were accepted at $P < 0.05$.

RESULTS

Demographic characteristics of the participants

Forty community pharmacists participated in this study. Out of the forty respondents, more females (60%) than males participated in the study. Most of the respondents were aged 20–30 years of age (52.5%). Details of the demographic profile of the respondents are shown in Table 3.

Pre-and post-assessment of the level of pharmaceutical care performance

Composite performance scores of 0.48 at pre-study and 0.61 at post-study revealed significant

Table 1: Simulated patients and scenarios

Scenarios	Activities
1. Simulated patient present to the pharmacy and asks to see the pharmacist. He complained of itching for the past 3 days	a. Private area for consultation b. Pharmacist documents complaints made by patients c. Pharmacist obtains patient drug history d. Standard means of documentation e. Pharmacists asks patient if he is on any drug or has taken any drug since the past three days f. Pharmacists asks patient if he changed cream or soap or is allergic to any substance
2. Simulated patient presents to the pharmacy and asks to see the pharmacist. He requested Lisinopril (10mg) for the father and septrin tablet for the cough the father had	a. Private area for counselling patient b. Document patient medication history and complaints c. Ask the patient if the drug was prescribed by a physician d. Ask if the cough was productive or non-productive e. Ask for how long he had experienced the cough f. Ask if another drug can be given for the cough in place of the septrin tablet
3. Simulated patient present to the pharmacy and request to see the pharmacist. He requested for diclofenac tablet, Naproxen tablet, and Ibuprofen tablet	a. Private area for consultation b. What was the pharmacist reaction c. Ask who is taking the drug d. Ask if the person had ulcer or heartburn or stomach pain e. Ask if the person is on any antacid or gastroprotection f. Ask for how long the person had been on the medication g. Were the drugs dispensed as requested
4. Simulated patient presents to the pharmacy. Complained to the pharmacist of passing watery stool with nausea, weakness, and pains all over the body	a. Private area for consultation b. What was the pharmacist's reaction c. Did the pharmacist prescribe any drugs d. Pharmacist asks the food the person took e. Ask if the person taking water or any other fluid f. Was antibiotics prescribed? If not, the patient should request for it g. Was there any referral

Table 2: Audit of other activities of community pharmacists

Assessing drug supplies in Community Pharmacies
1. Where do you procure your drugs
2. Any standard guideline in accessing drugs in your pharmacy
Detecting expired drugs in pharmacy
1. How often do you check for expired drugs
2. What method do you use to detect expired drugs
3. Average number of expired drugs in pharmacy each month
4. Presence of any stock card with manufacturing and expiry dates of drugs written
5. How do you dispose of expired drugs in your pharmacy
Training of pharmacy staff
1. Are your staff knowledgeable in community pharmacy operations
2. How often do you train your staff
3. How often do you participate in professional development programs or seminars or continuing education

Table 3: Demographic Characteristics of the Community Pharmacists that participated in pre- and post-assessment of the level of pharmaceutical care performance

Demographic characteristics	n (%)
Gender	
Female	24 (60)
Male	16 (40)
Age (Yrs)	
20–30	21 (52.5)
31–40	12 (30)
41–50	4 (10)
>50	3 (7.5)
Highest qualification	
FPC Pharm	2 (5)
M. Pharm	3 (7.5)
Pharm. D	0 (0)
B. Pharm	35 (87.5)
Practice experience (Yrs)	
1–5	23 (57.5)
6–10	9 (22.5)
11–15	6 (15)
>15	2 (5)

differences in the pre-and post- assessment level of pharmaceutical care performance in the community pharmacies ($P = 0<0.05$). The result of the analysis shows that the odds of the community pharmacist performing pharmaceutical care in the pre-test is 0.60 times their performing pharmaceutical care in the post-study. The result of McNemar's test is shown in Table 4.

DISCUSSIONS

The level of pharmaceutical care performed in community pharmacies in Anambra state was determined using the validated quality indicator; assessed through simulated patients and audit of other activities of the community pharmacies, and the attribute of the setting the care was provided.

The educational intervention was developed and implemented to improve the areas the community pharmacists perform poorly in rendering pharmaceutical care. The impact of the intervention on community pharmacists' performance of pharmaceutical care was assessed using the validated questionnaire, simulated patients, and audit of other activities of the community pharmacists.

This study revealed significant differences between the pre-and post-assessment level of pharmaceutical care performance. Results of the analysis revealed that 48% of the community pharmacists performed pharmaceutical care in the pre-test study while 61% performed pharmaceutical care in the post-test study.

Pre-assessment level of pharmaceutical care performance

Standard means of documentation

Assessment of community pharmacists' documentation activities revealed that community pharmacists in Anambra state do not document their pharmaceutical care activities. This is consistent with the result reported by a study.[8] A study[9] stated that the majority of the community pharmacists kept no records of pharmaceutical care activities. Another study[10] revealed that a good number of pharmacists had no documentation for patient follow-up. A study[11] revealed that the main elements of pharmaceutical care were missing among community pharmacists such as patient referral, documentation, and drug-related problems identification. A study[12] which stated that pharmacists in Kenya and the United States of America keep documentation of patients' records in pharmacy contradicts the result obtained from this study. The main aim of documentation is to show a record of what a practitioner does, why it's done, and the outcome of such actions. Lack of documentation shows a lack of practice. Failure to document pharmaceutical care activities can directly affect the patient's quality of care.

Referrals to other healthcare professionals

This study recorded poor referral of patients to other health care professionals and poor documentation of referrals by the community pharmacists. This is consistent with a study[13] where only a quarter of community pharmacists document referrals. To promote communication and collaboration between healthcare professionals, healthcare systems should be designed in such a way to ensure the coordination of patients' medication therapies. Adequate referral of patients to other healthcare practitioners by community pharmacists is essential to ensure the maintenance of the quality of care and continuity of care. Documentation of referrals is an important aspect of pharmaceutical care.

Communication

This study reported good communication between pharmacists and patients. The community pharmacist in this study communicated effectively with their patients. This is in contrast to studies[14-16] where poor communication and communication skills between pharmacists and patients were observed. A study[10] showed that many pharmacists do not counsel patients, and for some who counsel patients, the quality and extent of counseling is inadequate. Communication with patients has been emphasized as a core indicator of pharmaceutical care performance by community pharmacists. Failure of healthcare professionals to communicate effective medication use when starting new medications can result in a poor understanding of directions for medication use, and this can affect compliance with medication.

Dispensing of drugs

This study revealed unsatisfactory dispensing practices by community pharmacists. This is consistent with the results of studies[17,18] where dispensing practices were reported to be unsatisfactory. A study[10] revealed that only a small percentage of pharmacists provide patient counseling and drug dispensing instructions. This study revealed that none of the pharmacists wrote the name of the drug and its strength on the drug label. A study[18] revealed that few of the pharmacists wrote the strength of drugs dispensed on the label of drugs.

Table 4: Pre-and post-assessment of the level of pharmaceutical care performance

No.	Indicator	Pre-test (Freq)		Post-test (Freq)		Test statistics	Odds ratio	*P*-value
		Yes	No	Yes	No			
1.	Pharmacist knowledge and use of pharmacovigilance form	1	39	1	39	-	-	0
2.	Document patient history	0	40	30	10	28.033	0	0
3.	Documents complaints made by patients	0	40	30	10	28.033	0	0
4.	Drug information provided to patients based on need and understanding	30	10	30	10	0.05	1	0.82306
5.	Discusses adverse drug interaction, side effects, contra-indication	32	8	32	8	0.0625	1	0.80259
6.	Document medication errors discovered during dispensing and advises patients	0	40	30	10	8.1	0	0.00443
7.	Asked about drug allergies	40	0	40	0	-	-	0
8.	Adequate steps are taken to manage drug interactions	40	0	40	0	-	-	0
9.	Communicates in a clear simple language according to patients understanding	40	0	40	0	-	-	0
10.	Private area for counseling	37	3	37	3	1.6667	1	0.68309
11.	Patients referred to other healthcare professionals when necessary	5	35	5	35	0.1	1	0.75183
12.	Document referrals to other healthcare professionals	0	40	30	10	28.033	0	0
13.	Follow-up patients and documents patients contact and phone number as means of follow-up	0	40	30	40	28.033	0	0
14.	Advises patients to come back to the pharmacy after some days for follow-up	5	35	15	25	4.05	0.333	0.04417
15.	Provide information on gastroprotection to patients when necessary	40	0	40	0	-	-	0
16.	Offer gastroprotection to patients especially when it is lacking	30	10	40	0	8.1	0	0.00443
17.	Standard means of documentation of pharmaceutical care activities	0	40	30	10	28.033	0	0
18.	Adequately label dose and dosing frequency of medication	40	0	40	0	-	-	0
19.	Writes the name and strength of dispensed drug on label	0	40	10	30	8.1	0	0.00443
20.	Writes the course of the duration of dispensed drugs	3	37	30	10	20.485	0.1	0.00001
21.	Standard guideline in accessing supplies of drugs	0	40	0	40	-	-	0
22.	Validmeans of checking expired drugs	40	0	40	0	-	-	0
23.	Participation in professional development programs and seminars	28	12	28	12	0.0417	1	0.83826
24.	Pharmacy staff have adequate training on pharmacy operations	30	10	30	10	0.05	1	0.82306
Composite performance score		0.48		0.61		51.06619	0.60116	0

On the other hand, the pharmacists in this study wrote the dose of the drugs on the drug label. This is in contrast to a study[18] that reported few of the pharmacists wrote the dose of drugs on the label. Poor dispensing practices include but are not limited to: Lack of proper counseling of drugs, drugs not adequately labeled, and incomplete dispensing of drugs.[17] Patients' quality of life will be negatively impacted by poor dispensing practices.

Drug information

This study reported good provision of drug information by community pharmacists. Results from this study revealed that a good number of community pharmacists provided effective drug information to their patients. This is consistent with the study[19] where a good number of community pharmacists provided drug-related information to patients. This contradicts the result obtained from the study[20] which reported a lack of drug

information by community pharmacists relating to adverse effects to laypeople.

None of the pharmacists in this study documented patient drug information. This is consistent with the study by[8] where poor documentation of patient drug information by community pharmacists was recorded. A study[21] reported limited provision of drug information by pharmacists in India. The provision of drug information is very important to both the patients and healthcare professionals to promote Rational Drug Use.

Pharmacovigilance

This study reports a lack of pharmacovigilance knowledge and its reporting by community pharmacists. This is consistent with similar studies[22,23] which reported that many community pharmacists do not have pharmacovigilance forms in their pharmacies. A study[24] reported that the majority of the community pharmacists in Bangalore do not even know how they can obtain the pharmacovigilance form. A study[25] showed that the pharmacovigilance form (yellow form) had only been seen by a little percentage of the pharmacist in southeastern Nigeria. A study in Lagos[26] revealed that only a small percentage of the community pharmacists reported adverse drug reactions to the appropriate authorities. Community pharmacists are the first and in most case the last point of call for most patients so they must strengthen pharmacovigilance activities through reporting.

Standard guideline in accessing drug supply in community pharmacists

This study revealed the absence of a standard guideline in procuring drugs by community pharmacists. According to reports by the World Health Organization (WHO), 80% of developing countries have bad drug procurement and distribution system.[27,28] An uncoordinated drug distribution system is one of the major challenges of the pharmaceutical sector in Nigeria.[27] This has led to a difference in the prices and quality of drugs obtained in the community pharmacies in Nigeria.

Post-assessment level of pharmaceutical care practice

Outcome measurement took place 6 months after the educational intervention. This is contrary to findings[29] where outcome assessment took place a few weeks after intervention. Monitoring of patients' outcomes is very essential as it helps determine the effectiveness of the intervention employed. There was a statistically significant improvement in the post-assessment level of pharmaceutical care performance in the community pharmacies with 61% of the community pharmacist performing pharmaceutical care. The quality indicator that recorded the highest improvement was the community pharmacists' documentation of pharmaceutical care activities. There was however no improvement in pharmacovigilance reporting and standard guidelines for assessing supplies of drugs by the community pharmacists though the pharmacists were performing very poorly in those areas. This is, in contrast, to the result obtained by[30] that recorded that educational intervention improved knowledge and attitude of community pharmacists toward pharmacovigilance.

This study had some possible limitations. One of the limitations could have emanated from the disadvantages of pre-and post-test design such as "confounding," "temporal changes," "regression to the mean," and lack of "control group." We tried to avoid these limitations by successfully utilizing the simulated patient method, by insisting on documenting data collected "in character" and appropriate application of statistics.

CONCLUSION

Community pharmacists in Anambra state have poor performance of pharmaceutical care. The use of the validated quality indicator revealed areas community pharmacists perform poorly in rendering pharmaceutical care. Activities of community pharmacists should be assessed periodically using quality indicators to sustain pharmaceutical care performance. This should be among the items evaluated by the inspectorate team during their routine inspection.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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APPENDIX 1

EDUCATIONAL INTERVENTION

PHARMACEUTICAL LECTURE MODULES FOR COMMUNITY PHARMACISTS IN ANAMBRA STATE

COURSE OBJECTIVE

1. To help Community Pharmacists understand the importance of pharmaceutical care
2. To provide an overview of the pharmaceutical care process
3. To provide a better understanding of why Community Pharmacists should document pharmaceutical care activities

OVERVIEW

- The practice of pharmaceutical care
- The pharmaceutical care process
- Pharmacist-patient relationship
- Assessment
- Goals of therapy
- Interventions
- Referral
- Follow up
- Documentation of pharmaceutical ca