

Research Article

Patients' response to waiting time in an out-patient pharmacy in Nigeria

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Abstract

Purpose: To identify the dispensing procedure at a pharmacy, investigate the possible operational problems that may lead to excessive patient waiting times as prescriptions are filled and to examine patient disposition to perceived delays at the pharmacy.

Methods: The study was carried out in a 574-bed university teaching hospital in Ile – Ife, Nigeria. The subjects were out-patients who gave their consent to participate in the study. Data were collected using the techniques of workflow analysis and time study in observing the dispensing process. A validated questionnaire was administered on the out-patients to measure their responses to waiting in the pharmacy as well as their level of satisfaction with pharmaceutical services rendered.

Results: The workflow analysis revealed considerable delay in the dispensing procedure as a result of extended process components. The total waiting time for a dispensing process averaged 17.09 min, and 89.5% of this was due to delay components. Specifically, the major delay components included patient queues for billing prescription sheets and subsequent payment to the cashier. Operational problems identified included patients' indirect access to dispensing pharmacist and the tortuous procedure for prescription billing and payments. Generally, patients were not satisfied with undue delay caused by the dispensing procedure at the pharmacy.

Conclusion: Most of the patient waiting time in the hospital studied can be accounted for by delay components of the dispensing procedure. Attempts should therefore be made to reduce the time on these components of the dispensing process so that more time could be devoted to counseling while reducing the total time spent by the patient in having their prescriptions sheets filled.

Key words: Dispensing process; hospital pharmacy; pharmaceutical service; waiting time

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Introduction

Patient waiting time has been defined as 'the length of time from when the patient entered the pharmacy to the time the patient actually received his or her prescription and left the pharmacy'¹. A patient's experience of waiting can radically influence his/her perceptions of service quality. In a study carried out at the University of Southern California, Los Angeles, USA, it was shown that the overall satisfaction of patients with pharmaceutical services is closely related to their satisfaction with waiting time². Long waiting time has been given as a reason why some patients do not have their prescriptions filled in a particular pharmacy³. This shows the significance of waiting time on pharmacy services and patronage.

Patients are attended to in various units within the hospital system but almost invariably a high percentage of out-patient patrons visit the hospital pharmacy unit for their drug needs. These patients leave the doctors' consulting clinics and any of the other units at various times thus constituting a random arrival rate at the pharmacy, where the dispensing activities take place sequentially. Queues form when the rate of patient arrival at the pharmacy is greater than the service rate.

Excessive patient waiting time undermines pharmacy efficiency. Such delay leads to patient dissatisfaction and thus may eventually result in loss of patronage in a competitive health care system. It can also lead to poor patient compliance with instructions given at the pharmacy. Therefore, there is a need to carry out a systematic study on patient waiting time in a pharmacy, with a view to identifying the factors that affect waiting time and recommend ways of minimizing the delay.

To this end, this study sought to find answers to the following research questions in the context of a Nigerian hospital:

- i. What is the average patient waiting time in the pharmacy?
- ii. Are patients favourably disposed towards the prescription filling procedures i.e. the pharmacy dispensing procedures?
- iii. What time may be attributed to the process and delay components of pharmacy dispensing operations?
- iv. What are the possible operational problems that may lead to excessive patient waiting times?

Methods

The study was carried out between April and May 2002 at the out-patient pharmacy department in a university teaching hospital situated in Ile-Ife - an urban community in Southwestern Nigeria.

Ile-Ife, known as the cradle of the Yorubas, is an ancient town with a rich culture and notable historic sites. The town is one of the main cities in Southwestern Nigeria and Obafemi Awolowo University is strategically located beside the hills within the city. The university teaching hospital known as Obafemi Awolowo University Teaching Hospitals (OAUTH) is a 574-bed government-owned hospital providing health care services to Ile-Ife communities and other neighboring towns and villages. Also, by virtue of its location and the specialty health care services it offers, the catchment area of OAUTH is extremely large with referral cases from about six adjoining states thus bringing health care facilities close to the communities.

The pharmacy department is a service arm of the teaching hospital, which provides pharmaceutical services to both the in-patients and out-patients at the hospital. It is open to patients throughout the day but the peak hours for out-patients transactions is from 10.00 am to 1.00 pm daily on weekdays. At the time of this study, the number of pharmacists working in the hospital was 21, which consisted of 7 pupil

pharmacists, 2 National Youth Service Corps Pharmacists and 12 registered pharmacists. The total number of pharmacists working in the out-patient pharmacy was 9 and they were assisted by 4 attendants. The average number of prescriptions sheets dispensed per day at the out-patient pharmacy unit is 185. Prescription sheets are written and duly signed sheets indicating the drug items prescribed for a particular patient. Out-patients take their prescription sheets to the pharmacist who vets the drug items before dispensing. A prescription sheet may contain one or more drug items.

Due permission was sought from relevant authorities to carry out this study at the teaching hospital. Similarly, an initial interaction was made with the out-patients to establish rapport, introduce the questionnaire, seek their consent to take part in the study before requesting those that gave their consent to either complete or assist in the completion of the questionnaire used in this study.

A total of 100 out-patients randomly selected from the population of patients who normally patronized the pharmacy agreed to participate in the study. Similarly dispensing operations were observed and quantified for randomly selected prescription sheets but for patient samples different from those who completed the questionnaire.

Research Instruments

The data were collected by the use of questionnaire administered on the out-patient patrons at the pharmacy department. The questionnaire comprised of two sections with one of the sections on such demographic characteristics as sex, age occupation etc. The other section had 14 items designed to evaluate the extent of patient views on waiting time and the level of satisfaction with the quality of pharmaceutical services in the pharmacy. Examples of the items include 'waiting time at the pharmacy is too long', 'the

pharmacists are courteous to customers' and 'it takes an unnecessarily long time for the prescription sheets submitted at the pharmacy to be processed'. The questionnaire was subjected to pretest to determine reliability, over a two-week period, resulting in a reliability coefficient of 0.81. Construct validity was ascertained by the professional judgment of hospital pharmacists and a test developer. In particular, the items were ensured to sample aspects of the service quality such as pharmacist attitude to patient waiting time and frequency of pharmacists counseling on dispensed drugs.

Scoring of the items was done using tallies and summing up the frequency counts.

Measurement of Patients' Waiting Time

Workflow analysis method and the stop watch techniques were used to measure patient waiting time². The dispensing procedure in the pharmacy was first studied and then divided into sub-components and a stopwatch was used to determine the time spent for each sub-component. The workflow analysis highlights the sequence of activities involved in the dispensing procedure. The operation starts with submission of the prescription sheet by the patient and its subsequent flow through vetting by the pharmacist for appropriateness in drug combination and dosage; billing of the prescription items, payment to the cashier, dispensing and patient counseling. Various sub-components of the dispensing procedure were then grouped into two i.e. "process" and "delay". A process component involved a staff member actively working on the prescription, while a "delay" component involved the prescription sheet lying idle and waiting for a staff member to work on it.

Analysis

Statistical analysis was done using the SPSS version 10.0 software program for frequency distribution and cross tabulations.

Tests for statistical significance were done by the chi-square test for categorical data.

Results

All respondents who agreed to participate in the study actually did giving a 100% response rate. Most of the respondents (97.9%) came to the pharmacy to buy drugs on prescription. The remaining 2.1% came to request for drug information. Majority of the respondents visited the pharmacy occasionally (92.7%) or always waited to have their prescription filled at the pharmacy (91.7%). Too long waiting time was given as a reason for not always filling their prescriptions at the pharmacy by 8.3% of the respondents.

The sub-components of the dispensing process and the time spent for each sub component are shown in Table 1. The time distribution for the processing and delay components showed that delay components accounted for most of the patient waiting time. Out of the average 17.09 min of patient waiting time, 12.48 min were related to delay components and 4.61 min were related to process components. The delay components accounted for 73.02% of overall patient waiting time. Significant delay occurred prior to payment for the billed prescription, i.e. "collection of money, issuing of receipts and recording by the cashier" (8.68 min or 50.79% of total patient waiting time).

Fifty-two percent (52.1%) of the respondents described the time they spent waiting in the pharmacy as adequate while the rest 47.9% of the patients that considered the waiting time as either long or too long gave "shortage of pharmacists" and "too many procedures involved in dispensing process" as reasons for the long waiting time. Over 20% of the patients were not satisfied with the waiting time while 78.9% considered it as either fairly satisfactory or very satisfactory.

All respondents with primary education described the waiting time as adequate

compared to 58.3% and 41.7% of those with secondary and post secondary education, respectively (Table 2). More females (60.4%) than males (43.8%) considered the waiting time as adequate. Respondents below 20 yr of age and above 50 yr were more satisfied with the waiting time than others. Eighty percent of respondents who were traders found the waiting time to be adequate compared to 52% of students and 43.3% of civil servants. Respondents living outside the town (60%) where the hospital is located were less satisfied with the waiting time than others.

On counselling, 28.1% of the respondents claimed that they were always counselled on dispensed drugs, 34.4% claimed they were only counselled occasionally while 36.5% claimed that they were never counselled on dispensed drugs. For those that were counselled, the average counselling time by the majority (80%) of them was less than 2 min and this period was viewed as just enough by the majority of the respondents.

Some of the respondents (12.5%) were not satisfied with the pharmaceutical services at the pharmacy while the extent of satisfaction ranged from fairly satisfactory to very satisfactory. The effect of demographic factors on patients' satisfaction with pharmaceutical services is shown in Table 3.

Discussion

The data in Table 1 presents the time distribution in processing and delay components of the dispensing procedure. Analysis of this data showed that the longest delay occurred prior to "collection of money, issuing of receipt and recording", when patients had to wait on queue for an average of 8.68 min which was 50.79% of total patient waiting time. The source of this delay is likely to be the process step immediately after it. On observation, the average time taken by this process of payment/recording (1.42 min or 8.31% of total patient waiting time) is quite minimal, indicating that the

Table 1: Observed time distribution between processing and delay components for each component of the dispensing process

Components of Dispensing Procedure	No of samples	Time Spent (min)			
		Processing		Delay	
		Mean \pm SD	%	Mean \pm SD	%
Patient wait for attendant to collect prescription	24			0.76 \pm 0.05	4.45
Attendant takes prescription for billing	20	0.15 \pm 0.00	0.88		
Prescription placed on dispensing table for billing	20			0.44 \pm 0.01	2.57
Pharmacist bill and review prescription	25	0.62 \pm 0.01	3.63		
Billed prescription placed on dispensing table for attendant	25			0.60 \pm 0.02	3.51
Attendant takes prescription to patient	20	0.18 \pm 0.00	1.05		
Patient takes prescription to cashier	25	0.14 \pm 0.00	0.82		
Patient wait on queue for payment				8.68 \pm 0.98	50.79
Cashier collects money, issue receipt and record	25	1.42 \pm 0.37	8.31		
Patient collect receipt and prescription; and takes them to attendant	22	0.18 \pm 0.02	1.05		
Patient wait for attendant to collect receipt and prescription	25			0.56 \pm	3.28
Attendant takes prescription and receipt to pharmacist	25	0.12 \pm 0.03	0.70		
Prescription and receipt placed on dispensing table for pharmacist to fill	20			0.58 \pm 0.01	3.39
Pharmacist fill prescription	25	1.38 \pm 0.38	8.07		
Drugs placed on dispensing table for attendant	20			0.86 \pm 0.01	5.03
Attendant takes drug to patient, instruct and dispense	25	0.42 \pm 0.02	2.46		
Total		4.61 \pm 1.24	26.97	12.48 \pm 2.04	73.02

process was not efficient. However there was a time lag before this process was initiated and hence the long delay.

At the time of the study, there was only one "payment unit" at the pharmacy. Increase in the number of "payment units" should significantly reduce this delay. The potential for improvement is buttressed by the short delay observed prior to "filling of prescription

by pharmacist". The processing time for filling of prescription and payment/recording are similar. This was probably because there was more than one member of staff filling prescriptions and the time lag (delay) before initiation of the process which is significantly short.

Currently a significant number of the processing components involve movement from one area of the pharmacy to another. These processes included:-

Table 2: Cross Tabulation of Demographic factors against Patient Description of waiting time

Demographic Factors	Patient Description of Waiting Time (%)			Chi square	
	Adequate	Long	Too long		
Level of Education				12.33	p<0.025
Primary	100	0	0		
Secondary	58.3	33.3	8.3		
Post Secondary	44.6	32.4	23.0		
Sex				2.72	p>0.20
Male	43.8	37.5	18.8		
Female	60.4	20.8	18.8		
Age (Years)				13.74	p>0.05
<20	100	0	0		
>20 – 30	43.8	41.7	14.6		
>30 – 40	31.6	26.3	42.1		
>40 – 50	50.0	20.0	30.0		
> 50	100	0	0		
Occupation				17.91	p>0.20
Trading	80.0	20.0	0		
Schooling	52.2	32.6	15.2		
Civil Servant	42.3	23.1	34.6		
Others	30.0	50.0	20.0		
Area of Residence				6.67	p<0.05
Within town of hospital	55.3	27.6	17.1		
Outside town of hospital	40.0	35.0	25.0		

Table 3: Cross tabulation of demographic factors against level of patient satisfaction

Demographic Factors	Level of Patient Satisfaction with Pharmaceutical Services (%)				Chi square	
	Unsatis- factory	Fairly Satisfactory	Satisfactory	Very Satisfactory		
Level of Education					13.52	p<0.05
Primary	0	33.3	66.7	0		
Secondary	41.7	58.3	0	0		
Post Secondary	16.2	48.7	31.1	4.1		
Sex					5.99	p>0.10
Male	16.7	58.3	25.0	0		
Female	8.3	37.5	47.9	6.2		
Age (Years)					21.07	p< 0.05
<20	0	100.0	0	0		
>20 – 30	12.5	56.3	10.4	0		
>30 – 40	26.3	31.6	31.6	10.5		
>40 – 50	0	40.0	50.0	10.0		
> 50	0	30.8	69.2	0		
Occupation					15.78	p>0.05
Trading	10.0	20.0	70.0	0		
Schooling	8.6	58.7	32.6	0		
Civil Servant	11.5	34.6	42.3	11.5		
Others	30.0	70.0	0	0		
Area of Residence					8.26	p<0.05
Within town of hospital	15.8	39.5	42.1	2.6		
Outside town of hospital	0	80.0	15.0	5.0		

- (a) Attendant taking prescription to pharmacist for billing.
- (b) Attendant taking prescription to patient.
- (c) Patient taking prescription to cashier.
- (d) Patient collects receipt and prescription and taking it to the attendant.
- (e) Attendant taking prescription and receipt to pharmacist.
- (f) Attendant taking drug to patient, instructing and dispensing.

All the above processes accounted for 6.96% of the total waiting time or 25.81% of the time spent on processing components. Restructuring of the pharmacy layout appropriately to reduce movement will lead to a reduction in the total patient waiting time.

A delay is more likely to come up at the end of a process component due to a break in the workflow. Decrease in the number of process components of the dispensing procedure should lead to decrease in delay and subsequent decrease in total waiting time. For example, merging of the billing process and payment/recording will lead to elimination of about 9 out of the 16 components of the dispensing procedure. The evolved process (merged billing and payment/recording) could then be computerised to make it efficient. Another way of reducing delay is by increasing the number of "payment units" or servers at the pharmacy to two, especially during the peak hours. This has the potential of considerably decreasing the time lag (delay) before the process of payment/recording is initiated.

In a study carried out at the out-patient pharmacy of the University Hospital Inc. Cincinnati, Ohio², workflow analysis was used to document the detailed steps involved in the existing system that cumulated in a typical patient waiting time. At the end of the study, it was found that the "process" components accounted for 10.5% of the waiting time while the 'delay' components accounted for 89.5%. This showed that time spent on "delay" was

greatly excessive and a significant reduction in the time would have led to significant reduction in waiting time thus increasing efficiency of the out-patient pharmacy. In our study, majority of the patients always waited to fill their prescriptions at the pharmacy. Although only less than 10% did not always fill their prescriptions at the pharmacy, this group of patients should not be ignored as long waiting time which was given as the reason for not filling prescriptions at the pharmacy is important. It is pertinent to point out that patients who are told the expected waiting time and are kept busy while waiting have been found to have higher satisfaction perceptions⁴. Overall, satisfaction has been found to be more closely related to satisfaction with waiting time and whether the pharmacy staff are helpful and caring⁵. It has been reported that patients are least satisfied when waiting times are longer than expected, relatively satisfied when waiting times are perceived as equal to expectations, and highly satisfied when waiting times are shorter than expected⁶.

The average waiting time given by majority of respondents is 10–30 min. This corresponds to the average waiting time obtained from the time study (17.09 min). A number of studies had shown that patient waiting time could be managed effectively; thus improving the efficiency of the out-patient pharmacy. It has been found that waiting times, even if they cannot be shortened, can be managed more effectively to improve patient satisfaction⁷. Drug information/educational materials could be provided at the waiting area as most patients indicated that this was a desired service while waiting.

Cross tabulation of some selected items shows that there is a relationship between patient waiting time and patient satisfaction; most patients that described the waiting time as adequate were satisfied with the pharmaceutical services at the pharmacy e.g. all the patients of primary education level, while most patients that described the

waiting time as too long were not satisfied with the pharmaceutical services e.g. 70.6% of patients with post-secondary education were not satisfied with the pharmaceutical services. In a study with physicians, the importance of the level of education on perception of services was shown by the fact that patients who had higher education assessed the work of physicians more critically⁸.

A considerable number of female out-patient respondents (60.7%) considered the waiting time as adequate (Table 2) and they were quite satisfied with the pharmaceutical services at the hospital (Table 3). These results were not surprising as females are generally more likely to be patient and less in haste than males. Patients of post-secondary education are not likely to be easily impressed and are more likely to be critical and impatient than patient of lower educational levels. Some similarities were obtained between results obtained for educational level, occupation and age. This may be due to the fact that in the group studied people of post-secondary education level were more likely to be either students or civil servants and within the age range of 20 and 40 yr. These groups of patients are likely to be in haste due to their occupation (students and civil servants) because they may have to get back to their various places of work while most traders (because they are self employed) are less likely to be in a hurry.

Patients may be less able to judge the technical quality of the care they receive, but they do judge their social interaction with the pharmacist. Pharmacy professionals must increase patients' awareness of the value of pharmaceutical care services and make it important to their judgment of satisfaction⁹.

Conclusion

This study has shown that majority of the patients were fairly satisfied with the pharmaceutical services at the pharmacy

and the major cause of dissatisfaction was long waiting time although the level of satisfaction was found to vary among different groups of patients; with patients of post-secondary level of education, which are mainly students and civil servants being the least satisfied. The conclusion is reached that most of the patient waiting time in the hospital studied can be accounted for by delay components of the dispensing procedure. Attempts should therefore be made to reduce the time on these components of dispensing so that more time could be devoted to counselling while reducing the total time spent by the patient in having their prescriptions filled.

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