VOL. 4, NO.3, March 2014 ISSN 2225-7217
ARPN Journal of Science and Technology
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http://www.ejournalofscience.org

Assessment of Patient's Waiting Time in the Radiology Department of a Teaching Hospital

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ABSTRACT

Lengthy patient waiting time is a major cause of dissatisfaction of patients with healthcare providers [1]. This study aims at identifying the various steps in patient registration process that significantly contribute to the increased length of time spent by patients in the radiology department. 131 patient request cards were systematically sampled for the study. The times they arrived at the department, registered, taken into the diagnostic room, and when the patient was asked to go were recorded. Time differences were used to estimate the length of time request cards spent in each process. The mean (±SD) time a patient spent from time of reporting to the reception to leaving the department was 2hrs. 40mins ± 1hr. 16mins. Chest cases spent the least time of 2hrs. 29mins ± 1hr. 9mins, while those that came for extremities spent the longest time of 3hrs. 36mins ± 21mins. All other processing steps except film assessment by radiographers significantly affected the length of time patients spent. There is a need to review the registration process of the department so as to reduce the length of time spent by patients in the department and improve service delivery.

Keywords*: service delivery, patient waiting time, radiology, radiographer*

1. INTRODUCTION

The diversity of inputs and range of services provided makes the radiology department a very complex system to run [2]. One of the hallmarks of a well-managed radiology department is the short length of time patients spend before accessing a radiology service. Previous studies on the factors that affect patient's satisfaction with health care services show that they are patient centered, and include the time spent with the health care provider, willingness of the physician to listen to the patient, and expectations for treatment[3–6]. Lengthy patient waiting times have been fingered as the major cause of dissatisfaction with health care services [1, 7]. Anecdotal evidence points to this fact [8], and several authors have been equivocal on the negative relationship between patient waiting time and satisfaction with services rendered [1, 8–10]. Despite its deleterious bearing, it is but one more aspect of the factors that weigh against patient satisfaction with health care services. Anderson [11]demonstrated that overall patient satisfaction with health care services is determined to a great extent by the length of time spent with the healthcare giver. The radiology department under study provides several radiological services like Accident and Emergency Radiology, Conventional and Special radiological examinations, Theatre and Ward Radiography, Computed Tomography examinations, Mammography examinations, and ultrasonography. The objective of this study was to find out the average length of time a patients spends from reporting to the department to the time he/she leaves, and identify how the steps in patient registration contribute.

2. MATERIALS AND METHODS

This prospective longitudinal study was narrowed down to patients referred for conventional radiological examinations in the two diagnostic rooms available as at the time of this research. They include a diagnostic "Room 1" housing a floor mounted x-ray unit for axial and appendicular radiography apart from chest x-ray, and another room housing a mobile unit used exclusively for chest examinations. Ethical approval was obtained from the departmental ethics committee. Systematic Random Sampling was used to select 131 request cards over a 3 month period. Intern radiographers were posted to the three major areas where request cards pass through, which include the Reception area, Identification slip typing area, and the Radiographer's common room. They had recording sheets for collecting x-ray number, examination requested, diagnostic room where the exam is to be done, time-in and time-out. The intern at the reception sequentially numbered all the request cards according to their time of submission by the patient. Every fourth card was selected and details such as the x-ray examination requested, the arrival time to the reception which was considered to be the time the patient reported to the department, the time it left the reception to the assessment and costing area were recorded. The intern in the typing room recorded the time the selected cards coming from the reception entered and left. The last intern in the film assessment area recorded the time the sampled cards entered and left the room. All radiographers and health attendants not involved in the study were blind to the study. No effort was also made on the part of the observers to facilitate the movement of the cards. The final results were analyzed using IBM SPSS for Windows v 21.

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3. RESULTS

A total of 131 request forms were sampled for study. 69.5% (n = 91) of the cases were chest x-ray examinations while the remaining 32.8% (n = 40) were either skull or spine examinations (21.4%, n = 28), abdomen and pelvis (6.1%, n = 8), or involved the extremities (3.1%, n = 4). Figure 1shows the time that patients arrive at the department. Patients, on arrival, submitted their request cards for assessment between 8:00AM and 2:20PM. The highest number of patients (31.3%, n = 41) came between 10:00AM and 11:00AM, while the least number (2.29%, n = 3) came between 2:00PM and 3:00PM.

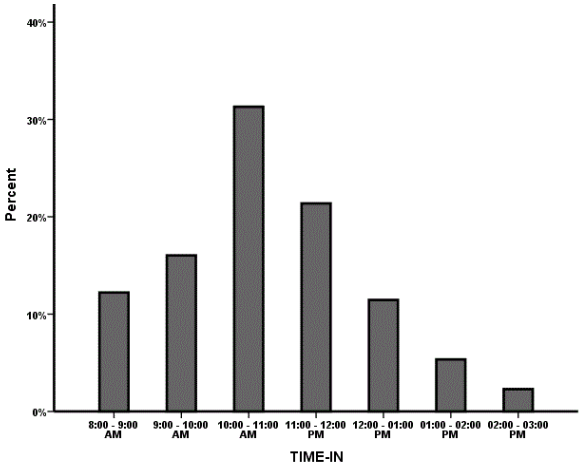

Fig 1: Bar chart showing distribution of arrival time of patients

Table 1 shows the various steps each patient undergoes to access radiological services. The requested radiological procedure and film processing lasted for an average of 1 hour 14mins (range 5mins to 5hours 33mins), while it took an average of 20mins (range 0 to 1hr. 50mins) for the films to be assessed and the patient to be discharged. In effect, each patient reporting to the radiology department spent not less than 45 minutes with are cord waiting time of 7 hours (mean: 2hrs. 40mins).

Table 1: Mean time for various steps taken in attending to patients

	Mean	Std. Deviation	Minimum	Maximum
COSTING AND PAYMENT	0:59	0:46	0:05	4:10
DURATION FOR TYPING SLIP	0:14	0:15	0:01	2:06
DURATION OF PROCEDURE	1:14	1:02	0:05	5:33
DURATION OF FILM ASSESSMENT	0:11	0:20	0:00	1:50
PATIENT WAITING TIME	2:40	1:16	0:43	6:59

Table 2 shows the various examinations requested along with the average time patients spent on each. Chest x-rays had the lowest mean waiting time of 2hrs. 29mins ± 1hr. 9mins while those that came for extremities stayed longer than others (3hrs. 36mins ± 21mins

Table 2: Mean time spent by patients undergoing various routine examinations

		PATIENT WAITING TIME				
		Table N %	Mean	Standard Deviation	Minimum	Maximum
EXAMINATION REQUESTED	CHEST X-RAY	69.5%	2:29	1:09	0:43	6:29
	SKULL AND SPINE	21.4%	3:02	1:22	1:19	6:28
	ABDOMEN AND PELVIS	6.1%	2:54	1:59	0:51	6:59
	EXTREMETIES	3.1%	3:36	0:21	3:07	3:55
	Total	100.0%	2:40	1:16	0:43	6:59

Pearson's correlation analysis between the total time spent by the patient in the department and each of the steps taken between registration and discharge of the patient is shown in Table 3.There was no significant relationship between the total time spent by the patient in the department and the length of time it took to assess the films by the radiographers. This length of time however was affected significantly by the time patients reported to the department, the time it took to cost and process the card to be ready for typing slip, the length of time it took for the slip to be typed, the duration of the examination and processing of the image.

Table 3: Pearson's correlation analysis between the total time spent in the department and the steps taken in attending to patients

TOTAL TIME SPENT BY THE PATIENT IN THE DEPARTMENT						
	TIME PATIENT REPORTED TO DEPARTMENT	TOTAL TIME SPENT BY THE PATIENT IN THE DEPARTMENT	COSTING AND PAYMENT	TYPING OF IDENTIFICATION SLIP	ATTENDING TO PATIENT AND PROCESSING FILM	FILM ASSESSMENT
Pearson Correlation	-.665**	1	.525**	.208*	.721**	.165
Sig. (2-tailed)	.000		.000	.017	.000	.059
N	131	131	131	131	131	131

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4. DISCUSSION

The common systems used for scheduling patients have been classified into three: pure block appointment systems, individual appointment systems, and mixed block-individual appointment systems [9]. The radiology department under study practices an open book appointment system, where a predetermined number of patients are booked per day. The date they are given depends on their arrival time, the pathology they present with, and their clinical departments. Patients from casualty department, paediatrics and children emergency are not given appointments; they are attended to immediately. Hoe [12] defined service quality as service that meets or exceeds the expectations of a customer, thereby making the customer happy. A radiology department can be said to offer good customer service when it constantly and consistently give their customers what they want and need [12]. Although crowded

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reception areas and long patient waiting times are a common sight in the hospital, it is ubiquitous in several other government health care institutions. 28.2% of the patients arrive before 10:00am. A greater percentage reports to the department between 10:00am and 11:00am, while the remaining 40.5% arrive between 11:00am and 2:00am. This could be attributed to the time they were released by the physician that requested for a radiological investigation. The arrival time surprisingly correlated negatively with the total time spent in the department, indicating that early arrival did not necessarily mean spending lesser time in the department. Patients on the average spend almost an hour after arrival getting their request cards ready for typing. Payments are made before 10.00am at a pay point in the department, after which patients have to go to a designated bank in the hospital, a 2 minute walk from the department, endure the queue, come back to the department to convert the payment teller from the bank to hospital receipts, submit same along with their request cards at the reception for registration and subsequent transfer to the typing room. Time could be saved by rerouting all payments to the pay-point in the department. Stress on patients will also be reduced. The manual registration of patients can be replaced by a simple computer program stationed at the reception area. This will have the added advantage of simplifying retrieval of patient data when needed. The typing room utilizes a manual typewriter for attaching identification slips. Each slip takes an average of 14 minutes. A means of printing out the patient's identification slip from the registered information in the computer system can remove the step in typing of slips and significantly reduce patient waiting time. Once the patient's request card is taken into the diagnostic room, it takes about an hour and a quarter for the patient to be called in, attended to by the radiographer, the films processed and then sent into the film assessment area. Since the department is still operating the analog system of film processing, digitizing the image acquisition and processing will drastically shave off time spent with automatic processing, sorting, and repeating poor quality radiographs. The effect of time spent assessing the films by radiographers had no statistically significant effect on the total patient waiting time but efforts aimed at reducing them could make the patients spend lesser time. One could be a simple intercom system between the film assessment area and the reception to inform the receptionist to immediately discharge a waiting patient whose films have been certified to be of diagnostic value.

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