ORIGINAL ARTICLE

Patients', nurses' and physicians' perception of delays in emergency department care

La Vonne A. Downey[1], Leslie S. Zun[2], Trena Burke[3]

1. Roosevelt University, Health Services/Public Adm, Chicago, IL, USA. 2. Department of Emergency Medicine, Finch University/Chicago Medical School; Department of Emergency Medicine, Mount Sinai Hospital, 15th and California, Chicago, IL, USA. 3. Department of Emergency Medicine, 15th and California, Mount Sinai Hospital, Chicago, IL, USA

Correspondence: La Vonne A. Downey. Address: Roosevelt University/School of Policy Studies, 430 Michigan Ave, Chicago, IL 60605, USA. E-mail: Ldowney@roosevelt.edu

Abstract

Background: Patients often judge their experiences in the emergency department (ED) based upon how long they have to wait, the attitudes of staff, and the information provided them.

Objective: The objective of this study was to assess the causes in constraints to patient flow in emergency departments by comparing staff, patient, and DSS data findings.

Methods: A random sample of patients and their healthcare providers were administered a survey asking them to rank the reasons for delay during three points after triage (60, 120, 180 minutes). A comparison was then done using Spearman's rank correlations and a regression model with independent indicators collected from the hospitals Decision Support System (DSS) which included: time to be seen by doctors, time to laboratory test results, time for radiological results, wait time for hospital bed and discharge in order to compare if the perceptions of constraints are related to the actual reasons for delays in the ED. This study was approved by the Internal Review Board.

Results: There was a significant correlation in the ranking of the reason for delays within the first, second and third hours between patients, nurses and doctors. However, when comparing perceptions for delay and independent data, only nurses within the third hour were correct in their understanding of the constraints that lead to delays.

Conclusions: Overall, patients and staff view similar reasons for constraints to their timely flow through the ED. There is, however, very little correlation between the survey responses and the independent factors that did constrain the flow of the ED. A more extensive use and integration of the DSS system by staff could provide more reliable information for reasons for delay that could be communicated to the ED patients which could improve customer service.

Key words

Communication and wait times, Perceptions, Emergency department, Patients, Healthcare providers

1 Introduction

The manner in which patients judge an emergency department (ED) is often based on how long they have to wait, the attitudes of staff, and the ability of staff to provide information [1]. This has been shown to be used as markers of perception

of care. Patients themselves may not be able to adequately judge the level of care they receive [1, 2]. This is due to the difficulty in obtaining and understanding medical information, in other words, the high information costs related to acquiring this knowledge [2-5].

There is a direct link between patient satisfaction and throughput time in the ED. Boudreaux, *et al*., found that patients' overall ED satisfaction ratings were linked to perceived throughput time [5]. Variables that effected that perception were based upon patient and physician interactions and the number of communications. The leading reasons for the increased throughput time break down into internal and external factors. The external factors are the increase in number of patients seeking care and the complexity of the illnesses that those patients present with to the ED [6]. The secondary explanation is due to internal factors such as delays in radiology, laboratory and availability of beds [4-8]. Sinreich, *et al*., in a comprehensive study of major hospitals, found the chief culprit of long wait times was delayed access to auxiliary services [9]. They found that 51 to 63 percent of the total patient turnaround time was due to time waiting for x-ray examinations, the first physician's examination and waiting time for blood. In reducing two or more of these factors, wait times could be reduced significantly. Few studies have compared the reasons that staff give, as opposed to patients, as negatively effecting throughput. Several studies have shown that staff assessment of ED overcrowding was not reliable, and depended on their perception of their own ability to perform their job roles [10-12]. According to Reeder *et al*., ED personnel judge wait delays based on external factors such as an increase patients complaints, boarding of patients in hallways, and long waits for beds for those patients who are already admitted [12].

ED staff see the parts separate from each other such as the physician sensing delays due to spending lots of time on two intensively ill patients and the charge nurse seeing delays due to waiting for beds, versus understanding the system as a whole [12]. They, like the patients do not see how each aspect plays into reasons for delay for the remaining patients. This can create a problem when information communicated between the two component parts (staff and patients) is incorrect and based solely on their job or prospective, which in turn negatively impacts perceptions of customer service [12, 13]. Previous studies have helped to clarify what patients want and expected in the way information is communicated and how it is communicated in the ED [12, 13]. Patients want medical staff to communicate what they are doing, why they are doing it, what the problem is, and how long the wait is going to be in the ED [13, 14]. Patients also expect that this communication be done personally and in plain language. The ability to meet these expectations could improve patient satisfaction because it has been shown that staff interpersonal and communication skills along with the provision of information are predictive of patient satisfaction [12-16].

2 Methods

2.1 Study design-setting and protocol

The study was performed in the emergency department of a community inner city teaching hospital emergency department with 40,000 patient visits per year. Random numbers were generated using STAT TREK for each day based on the total number of patients seen during a 24 hour period. STAT TREK is a kind of statistical software that has a random number generator to create a list of random numbers, based on your specification, such as number of patients seen in a 24 hour period. From those numbers a random sample of patients was generated based on assignment of patient numbers. Those patients who were only known by their patient numbers were then approached by a research fellow during all shifts and asked to take part in the study. Only those patients who were medically stable and had given consent to take part were included in the study. Patients were told in the consent forms and by the research fellows that they could stop the survey at any time for any reason. The research fellows had received six hours training in how to approach patients, certification in HIPPA (Health Insurance Portability and Accountability Act) which protects patients medical information and human subject research per federal standards, and in how to administer the survey prior to the beginning of the study. Research fellows are also overseen by emergency department research administrator, department chair and external academic researcher. The research fellows then administered, which included giving the patients a copy and reading it to them, a

validated constraints in patient flow survey [1, 12]. See Table 1. This survey asks the patient and ED staff, including doctors and nurses, to rank among six responses the reasons for delay during three points after triage (60, 120, and 180 minutes). The survey responses were not identified and no patient, doctor and nurses names were on the survey forms. This study was internal review board approved.

Table 1. "Constraints in Patient Flow within ED" Survey Questionnaire

Demographics: Please check appropriate response

_____ Patient   _____Nurse   _____Doctor

Survey:

At the snapshot of 1 hour, 2 hour, 3 hour after triage, please rank the reasons that patients are likely to be waiting according to the frequency of occurrence, 1 being most likely and 3 least likely.

                              Have enrollee rank top 3 reasons for waiting….

1= Most Likely   3= Least Likely

1 hour	2 hour	3 hour	Reasons patients are waiting	Ranking Order
			ED doctor yet to commence assessment	
			ED assessment/treatment in progress	
			Waiting for investigation to be performed (e.g. blood tests, X-Rays, CT scan, ultrasound, etc)	
			Waiting for results from labs or investigations	
			Awaiting review by subspecialty team (e.g. Medical, Surgical, Pediatrics, ENT)	
			Awaiting Bed allocation (No beds or beds not ready)	
			Awaiting transport (orderly, ambulance, family, etc)	

2.2 Data analysis

The results of the surveys were entered into SPSS (Chicago, version 16). The results were compared within each time interval and between patients, nurses and doctors using a Spearman's rank correlation coefficient. This determined if there was a significant correlation between rankings of reasons for delay between each category of reasons given and time period. A regression model was then used to compare the results of these surveys to independent indicators. These indicators are taken from The Decision Support System (DSS) which the hospital uses to track a patients progress during their time in the ED and the hospital. DSS is an interactive software-based system which compiles information from a combination of raw data, and documents, to help identify and solve problems in real time [17]. It produces decision support -based reporting and analysis on a micro and macro level [17]. The independent variables in the model were: actual time before being seen by doctor, time waiting for laboratory test results, time waiting for radiological results, and time waiting for hospital beds or discharge. The dependent variables in the model were: the staff and patient perceptions of constraints to patient flow during each of the time periods the survey was administered.

3 Results

A total of 203 patients consented to take part in the study. Half of all participants were between 24 to 44 years of age, with less than 10 percent being over 60. More women (at 59%) than men (at 41%) participated in the study. The study population was largely African American 80%, followed by 15% Hispanic and 5% white. The educational range was split

between 28% some high school, 28% high school, 23% some college, 7% college graduates, with the remaining patients responding that they had some high school education. They presented with a range of chief complaints, with chest pains at 15%, abdomen at 14%, general at 11%, musculoskeletal at 10%, female-related at 8%, neurological at 6%, and the remaining categories at less than five percent.

Table 2. Response per interval asked

	Patient	**Nurse**	**Physician**	**P**
First Hr – 1st Reason	MD yet to assess (28.1%)	Waiting for results (27.6%)	MD yet to assess (26.1%)	.01
First Hr-2nd Reason	ED Assessment/treatment26.6%	ED assessment treatment (23.2%)	ED assessment treatment (22.2%)	.01
Second Hr-1st Reason	Waiting for results (28.6%)	Waiting for labs (29.6%)	Waiting for results (27.6%)	.01
Second Hr-2nd Reason	ED assessment treatment (24.1%)	ED assessment (24.1%)	ED assessment (25.1%)	.01
Third Hr-1st Reason	Discharge admitted (32.0%)	Waiting for labs (32.0%)	Discharge admitted (32.0%)	.06
Third Hr-2nd Reason	Discharged admitted (32.0%)	Discharge admitted (32.0%)	Discharge admitted (32.0%)	.01

In order to determine if there was a significant difference between the three groups with respect to perceived delays in the ED, a Spearman's rho was used to compare the ranking of reasons given by each group. The three groups were of equal numbers and had equal variance. The *P*-value for statistical significance was set at .05, with an r s value of .5 - .8 as being a sign of strong correlation of ranking of reasons. There was a significant correlation between the reason for constraints given by patients and nurses (.498, .01), nurses and doctors (.577, .01), or patients and doctors (.553, .01) within the first hour. The same was true between the doctors and patients in the second hour (.547, .01) and nurses and patients (.519, .01) and doctors and nurses (.657, .01). The third hour also had significant similarities in ranking of constraints between doctors and patients (.811, .01), but not for nurses whom rated the primary reason for delay as waiting for labs. See table I for results.

A regression model was then used to compare the results of these surveys to independent indicators collected from the hospitals decision support system (DSS)—actual time before being seen by doctor, time waiting for laboratory test results, time waiting for radiological results, and time waiting for hospital beds or discharge—in order to determine any correlation between the dependent staff and patient perceptions of constraints to patient flow versus the independent indicators. The only significant finding (*t*= -2.205, *p*=.029, *r* squared= .51) was the nurses' perception of waiting time for laboratory results and laboratory order time to complete during the patients third hour in the ED was correct in that it did account for the wait times for those patients who had not been admitted or discharged. The real reasons for delay in the first hour were waiting for laboratory or radiological tests to be completed. The second hours delay was due to waiting to be admitted or discharged.

4 Discussion

Overall patients, nurses and doctors agreed on the reason they ranked for delays within each time period of the study. There were some differences, although they were not large when comparing percentage response. The first difference was in the area of patients (at 4%) stating they were waiting for a subspecialty review, whereas doctors stated it at 7%. The second difference was with doctors stating (at 8%) they were waiting for patient transport, whereas only 4% of patients

gave that as the reason for delay. During the third hour, 16% of patients stated they were waiting for laboratory results, as compared to half that number (8%) reported by doctors. Nurses' and patients' perceptions differed, with 19% of patients saying they were awaiting a doctor's assessment, as opposed to only 10% of nurses agreeing. So, too, with their perceptions of awaiting laboratory results, with 27% of patients giving this as a primary reason for delay, as compared with only 13% of nurses.

These similarities in rankings of constraints did not however, really explain the real reasons for delays or constraints in the ED. This was seen when making a comparison of staff and patient perceptions and the correlation between DSS collected independent data. The perception of delays related to waiting for laboratory results was only correlated with the nurse's response. This finding was also only true for the third hour, during which a large percentage of patients were either admitted, or admitted but waiting for a bed or discharged. This conclusion does support previous findings that staffs' perceptions do depend on their role and interaction with their patients, with nurses having more interaction with patients during this time period [12]. This study found, as did Sinreich, *et al.*, that the nurses versus doctors and patients were correct in stating the real reasons for delay [9]. This however was only for a specific time period with what were more complicated cases. That finding showed that for all other time periods, as Reeder, *et al.*, say in their study, that staff perception, was not a good indicator of the actual reason for delay [12]. This indicates a need for a better understanding by staff of reasons for delays. There is, however, very little correlation between the survey responses and the independent factors that constrain the flow of the ED. In fact, only during the third hour do nurses correctly correlate the reasons for delay and again this may be due to them having the most interaction with those patients during this time [12]. Since we know from previous studies that those patients who wait the longest have the lowest level of customer service satisfaction, this study points to factors that need to be addressed, and can provide some guidance to what resources can improve communication. Patients, as several other studies have shown, want staff to communicate with them directly about their treatment and the treatment process during their time in the ED [13-15]. This study shows that patients did not understand or were not given by medical staff the correct reason for delays in their treatment. It is important that the ED medical staff find a way to address patient's expectation in this area as it has been shown to increase patient satisfaction [12-15]. This seems to be especially true for patients who remain the longest in the ED and whom have the lowest reported levels of patient satisfaction [5].

The results indicate that staff should consult the hospitals DSS system to identify reason for delay and not rely on their own perceptions. DSS can serve as a guide to understanding the way the whole system impacts delays. Use of the DSS system can potentially improve communication between patients and health care providers in the ED. Once that is accomplished then a more comprehensive and realistic communication can occur between staff and patients in order to better understand delays. The use of this tracking system would allow for the type of ongoing communication about the ED process between medical staff and patients to occur. The use of the DSS system to give medical staff information they can communicate to patients could help to achieve what Taylor *et al.* stated were the three aspects that would improve patient satisfaction in that it would foster the interpersonal and attitudinal skills of staff, increase the information provided, and reduce the perceived waiting time [13].

5 Limitations

This study was done at one location, an inner city Emergency Department. Results would likely have been different if another hospital, such a suburban ED, was used for comparison. This may have indicated different factors that influence throughput times. The type and number of illnesses may also vary in differing ED settings. This would generate different needs from the ED and the hospital. Responses could also have less variability due to patients and staff members physically seeing only certain aspects of what impacts the ED process. They only commented on what they saw or experienced directly, versus other, unseen components, such as types of patients who present and the extensiveness of their illness, bed availability, and other departments' time usage of laboratory and radiological services.

6 Conclusions

Overall, patients and staff view similar reasons for constraints to their timely flow through the ED. There is, however, very little correlation between the survey responses and the independent factors that did lead to constraining the flow of the ED. In fact, only during the third hour do nurses correctly correlate the reasons for delay. A more extensive use and integration of the DSS system by staff could provide more reliable information that can be communicated to the patients in the ED with regards to reasons for delay which could improve customer service.

References

[1] Chan, A. Arendts, G. Causes of constraints to patient flow in emergency departments. Emerg Med Australasia. 2008; 20(3): 234-240. PMid:18400001 http://dx.doi.org/10.1111/j.1742-6723.2008.01079.x

[2] McCaig, L, F., Burt, C.W., A National Hospital Ambulatory Medical Care Survey: 2002 Emergency Department Summary, Adv Data. 2004 Mar 18; (340): 1-34. PMid:15068333

[3] Emergency department overload: A growing crisis. (2002, April). The Lewin Group of AHA ED and hospital capacity survey.

[4] Cunningham, P., May, J. Insured Americans drive surge in emergency department visits [Internet]. (October 2003). Available from: www.hschange.org/content/613 accessed May 2011.

[5] Boudreaux E. D., Friedman J., Chansky, M.E., Baumann B., M., Emergency department patient satisfaction: examining the role of acuity, Acad Emer Med. 2004;11(2): 162-8. http://dx.doi.org/10.1197/j.aem.2003.08.018

[6] Miro, O. Sanchez, M, Espinosa, G. Analysis of patient flow in the emergency department and the effect of an extensive reorganization. Emerg Med J. 2003; 20: 143-148. PMid:12642527 http://dx.doi.org/10.1136/emj.20.2.143

[7] Downey, LA and Zun, LS: Determinates of Throughput Times in the Emergency Department. J Health Management. 2007; 9(1): 51-58. http://dx.doi.org/10.1177/097206340700900103

[8] Holland, L.L., Smith L.L., Blick K.E. Reducing laboratory turnaround time outliers can reduce emergency department patient length of stay: an 11 hospital study. American J Clinical Path. 2005; 123(5): 672-4. http://dx.doi.org/10.1309/E9QPVQ6G2FBVMJ3B

[9] Sinreich, D., Marmon, Y., Ways to Reduce Patient Turnaround Time and Improve Service Quality in Emergency Departments. J Health Organ Manage, 2005; 19(2): 88-105. http://dx.doi.org/10.1108/14777260510600022

[10] Chan, B. T. and Ovens, H.J., Frequent Users of Emergency Departments. Do they also Use Family Physicians' Services? Can Fam Med, 2002; 48: 1654-60.

[11] Understanding Emergency Wait Times: Who is using the Emergency Department and How Long are They Waiting, Sep 2005, Canadian International Health Institute.

[12] Reeder T, Burleson D, Garrison H. The Overcrowded Emergency Department: A comparison of Staff Perceptions. Acad Emerg Med. 2008 Oct; 10: 1059-1064. http://dx.doi.org/10.1111/j.1553-2712.2003.tb00575.x

[13] Taylor C, Benger JR. Patient satisfaction in emergency medicine. Emerg Med J. 2004; 21: 528-52. PMid:15333521 http://dx.doi.org/10.1136/emj.2002.003723

[14] Boudreaux ED, Ary RD, Mandry CV, *et al*. Determinants of patient satisfaction in a large municipal ED: the role of demographic variables, visit characteristics and patient perceptions. Am J Emerg Med. 2000; 18: 394-400. PMid:10919526 http://dx.doi.org/10.1053/ajem.2000.7316

[15] Boudreaux ED, O'Hea EL. Patient satisfaction in the emergency department: a review of the literature and implications for practice. J Emerg Med. 2004; 26: 13-26. PMid:14751474 http://dx.doi.org/10.1016/j.jemermed.2003.04.003

[16] Cooke, T, Watt D. Wertzler, W, Quan H. Patients expectation of emergency department care. Can J Emerg Med. 2006; 8(3): 148-157.

[17] Lukasic, C. The Future of Decision Systems in Hospital Management. J Soc Health Syst. 1991; 3(1): 47-66.