SQU Med J, February 2012, Vol. 12, Iss. 1, pp. 86-92, Epub. 7th Feb 12.
Submitted 8th May 11
Revision Req. 23rd Aug 11, Revision recd. 15th Sep 11
Accepted 30th Nov 11

CLINICAL & BASIC RESEARCH

What are Patients' Concerns about Medical Errors in an Emergency Department?

Nahid Kianmehr,[1] *Mani Mofidi,[2] Hossein Saidi,[2] Marzieh HajiBeigi,[3] Mahdi Rezai[2]

ما هي مخاوف المرضى من الأخطاء الطبية في قسم الطوارئ؟

ناهيد كيانمهر، مانى مفيدى، حسين سعيدى، مرضيه حاجى بيكَى، مهدى رضايى

الملخص: الهدف: زادت المخاوف من الأخطاء الطبية في الآونة الأخيرة، وفهم كيفية تصور المرضى للخطأ الطبي يساعد مقدمي الرعاية الصحية على تبديد المخاوف المتعلقة بالسلامة، وزيادة رضا المرضى. هدف هذه الدراسة هو تقييم مخاوف المرضى من الأخطاء الطبية وعلاقتها مع خصائص المريض ورضاه. **الطريقة:** أجريت هذه الدراسة الوصفية المقطعية في قسم الطوارئ في مستشفى جامعي خلال فترة أسبوع واحد في أكتوبر 2008. تم استخدام استبيان لتقييم مخاوف المرضى من الأخطاء الطبية ومستويات رضاهم في كل من مقابلة أولية وعن طريق الهاتف بعد 7 أيام من إخراج المريض من المستشفى. تم جمع البيانات وتحليلها بواسطة مربع كاي وفحص تي والانحدار اللوجستي. **النتائج:** من ضمن 638 مريضا تم استبيانهم ، أظهر 61.6% منهم ارتياحهم بدرجة جيدة إلى ممتازة؛ بينما بين 93 مريضا [14.6%] درجة رضاهم بأنها ضعيفة؛ و 152 مريضا [23.8%] بأنها متوسطة؛ و 296 [46.4%] بأنها جيدة؛ و 79 [15.2%] بأنها ممتازة. كان 48.3% من المرضى (44.5–52% ، مع حدود الثقة 95%) قلقين من وقوع خطأ طبي واحد على الأقل. هناك علاقة واضحة بين معدل الرضا العام ووجود قلق لخطأ طبي واحد على الأقل (مربع كاي ، P <0.001). الخلاصة: أظهرت هذه الدراسة أن العديد من المرضى كانوا قلقين من الأخطاء الطبية في حالات الطوارئ الخاصة بهم. بسبب الضغوط الموجودة في أقسام الطوارئ، يمكن تحسين سلامة المرضى وزيادة رضاهم من خلال فهم أفضل لمخاوف المريض، وتثقيف الأطر الطبية العاملة في تلك الأقسام وتحسين العلاقة بين المريض والطبيب.

مفتاح الكلمات: خدمة الطوارئ، مستشفى، أخطاء طبية ، مرضى، رضا، مريض، إيران.

abstract: ***Objectives:*** Concerns about medical errors have recently increased. An understanding of how patients conceptualise medical error would help health care providers to allay safety concerns and increase patient satisfaction. The aim of this study was to evaluate patients' worries about medical errors and their relationship with patient characteristics and satisfaction. ***Methods:*** This descriptive cross-sectional study was done in the Emergency Department (ED) of a university hospital over a one week period in October 2008. A questionnaire was used to assess patients' worries about medical errors and their satisfaction levels both at an initial interview and by telephone 7 days after discharge. Data were gathered and analysed by $\chi 2$, t-tests and logistic regression. ***Results:*** Of 638 patients interviewed, 61.6% declared their satisfaction rate as good to excellent; (93 [14.6%] as poor; 152 [23.8%] as fair; 296 [46.4%] as good; 97 [15.2%] as excellent). A total of 48.3% of patients (44.5–52%, with confidence interval 95%) were concerned about the occurrence of at least one medical error. There was a clear relationship between the general satisfaction rate and having at least one concern about a medical error (Chi-square, P <0.001). ***Conclusion:*** This study showed that many patients were concerned about medical errors during their emergency care. Due to the stressful situation in EDs, patients' safety and satisfaction could be improved by a better understanding of patient concerns, education of ED staff and an improvement in the patient-doctor relationship.

Keywords: Emergency department; Medical errors; Patient concern; Satisfaction; Iran.

Advances in Knowledge

This article showed that nearly 50% of emergency patients at Hazrat e Rasool Akram Hospital, Teheran, Iran, had concerns about at least one type of medical error.

Applications to Patient Care

It is important to decrease concern about medical errors as this will have a positive effect on patient satisfaction.

[1]Department of Internal Medicine, Tehran University of Medical Sciences, Iran, and Department of Internal Medicine, Hazrat e Rasool Akram Hospital, Tehran, Iran; [2]Department of Emergency Medicine, Tehran University of Medical Sciences, Iran, and Emergency Department, Hazrat e Rasool Akram Hospital, Tehran, Iran; [3]Department of Forensic Medicine, Tehran University of Medical Sciences, Iran, and Hazrat e Rasool Akram Hospital, Tehran, Iran

Corresponding Author e-mail: m-mofidi@sina.tums.ac.ir

Emergency departments (ED) are busy environments. Confrontation with a wide variety of injuries and illnesses causes a very stressful climate both for patients and physicians.[1] There are many causes of the concerns that can ultimately lead to patient dissatisfaction. Overcrowding, the limitations of nurses and resources, the seriousness of illnesses or injuries and the presence of too many patients who require acute inpatient care, can all disturb patients. Regardless of how well trained and experienced the emergency physicians are, they can make mistakes as they are only human.[2] The probability of medical errors is increased by the acute and unpredictable presentations of illness, and by having to work in a busy and overcrowded environment.[3,4]

The worldwide expansion of medical knowledge through different kinds of media, has led many people to believe that medical care is not totally safe and that they can become victims of medical errors.[5] In one study, 75% of patients experienced concerns about medical errors during their hospitalisation.[6] In another study 39% of patients were anxious about the occurrence of at least one medical error.[7] Unaddressed patients concerns can lead to dissatisfaction, an unwillingness to return to or recommend this hospital to their relatives, non-compliance with medical advice, and an increase in medico-legal claims.[8,9]

Patients expect to be aware when, where and how malpractice issues happen. They also want to know the reasons for the occurrence and ways to prevent errors.[10] Studies of the delivery of health care services are producing improved safety suggestions. Some important aspects of improved care are good teamwork, anticipation of unexpected events, improving communication, providing a conducive learning environment, updating drug delivery systems, addressing patient concerns and engaging patients in error prevention.[10,11] The unique characteristics of emergency departments make this environment a suitable place to study patient concerns about medical errors. This study was conducted to determine ED patients' concerns about medical errors and their relationship with their general characteristics and satisfaction status.

Methods

This study was a descriptive cross-sectional study, conducted in the ED of Hazrat e Rasoul Akram Hospital in Tehran, Iran, during a 7 day period in October 2008. The ED has an annual intake of 50,000 patients with both medical and surgical complaints. All adult patients who presented to our ED during the study period were included in the study. Patients with a decreased level of consciousness, who were chemically intoxicated, aged <18 years, or those who were unwilling to participate in the survey were excluded from the study.

All of the included patients were interviewed with a questionnaire about their medical error concerns and their satisfaction with different components of ED services along the lines of patient satisfaction surveys carried out in previous studies.[12–14] Questions covered subjects such as triage performance, quality of care provided, physical environment, nursing and physician behaviour, and the general opinion about the ED experience. The answers were rated on a five point Likert scale: 5 = excellent, 4 = very good, 3 = good, 2 = fair, 1 = poor. Additional information, including age, sex, type of medical insurance, educational level, main physical complaints, time of admission, and length of stay in the ED, were extracted from the patients' files and recorded. During the survey testing phase, in order to tune the questionnaire to our culture, 8 related concerns, which were proposed in the Burroughs, *et al.* study, were also investigated for 30 patients.[1] They were also asked one open-ended question about their other concerns during their stay in the ED. Based on these patients' views, we then added two items: mistakes by medical students and ED waiting/treatment time.

The same questionnaire was administered in the ED and then again, 7 days after discharge, by telephone interview. For the latter, up to 10 attempts were made to contact each patient. For patients who were admitted to the ward, their follow-up questionnaire was completed at their bedside. In the questionnaire, patients were asked whether they experienced any of the following medical errors during their hospital stay (coded as yes/no): prescription of wrong drugs; operational problem of medical equipment; nursing mistake; physician mistake; medical student mistake; identity mistaken for that of another patient; laboratory test mistakes; improper diagnosis; lengthy waiting/treatment times, and fall from hospital bed (concern that they might fall).

Table 1: Demographic data and clinical characteristics of participants

Variable	n (%)
Age±SD in years	40.4±18.5
Sex:	
Male	345 (54)
Female	293 (46)
Length of ED stay, in hours	6.37±7.4
Education (university degree)	141 (22.1%)
Insurance holder	370 (58%)
Outcome:	
Discharge	366 (57.4%)
LAMA	102 (16%)
Admitted to ward	170 (26.6%)
Overall satisfaction	
Excellent	97 (15.2%)
Good	296 (46.4%)
Fair	152 (23.8%)
Poor	93 (14.6%)

Legend: SD = standard deviation; ED = emergency department; LAMA = left against medical advice.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS, Version 14, IBM, Chicago, Illinois, USA) to answer the following main questions: 1) Which medical errors are the greatest patient concerns? 2) Is there any correlation between medical errors and patient characteristics? and 3) Do patient concerns affect patient satisfaction? The chi-square test was used for categorical variables, the unpaired t-test for continuous variables and multivariable logistic regression for prediction. The study was approved by the Ethics Committee of the Faculty of Medicine of Tehran University of Medical Sciences. The researchers obtained consent from patients for participation in the study.

Results

A total of 638 (75%) of the 850 patients included in the study completed both the initial questionnaire interview as well as the 7-day follow-up telephone interview which repeated the same questions. Patients' characteristics are summarised in Table 1. A total of 61.6% of patients had a satisfaction rate of good to excellent; (93 [14.6%] poor; 152 [23.8%] fair; 296 [46.4%] good; 97 [15.2%] excellent). A total of 48.3% of patients (44.5–52%, with confidence interval 95%) were concerned about the occurrence of at least one medical error. Some of them reported more than one. If patients' responses changed between the initial questionnaire and the 7-day follow-up questionnaire, we took into account all of the concerns mentioned by the patient. The percentages of patients' concerns are shown in Figure 1 as: prolonged ED stay (19%); medical student related error (18.7%); errors with equipment malfunction (8.6%); improper diagnosis (7.1%); injury due to fall from hospital bed (5.6%); physician' fault in management (4.5%); identity mistaken for that of another patient (4.4%); laboratory test mistake (2.7%), and nursing mistake (0.6%)

We assessed the factors that might have affected patient satisfaction. This revealed that the gender of patients (chi-square, P = 0.141), their educational grade (chi-square, P = 0.110), age (t, P = 0.191), and length of stay in ED (t, P = .404) did not have any significant relationship with patient satisfaction; however, the outcome of patients (discharged, admitted to wards or those who left against medical advice) (chi-square, P <0.001), and having medical insurance (chi-square, P = 0.20) did have a significant relationship with patient satisfaction.

We found, on the one hand, that only four (3.92%) of the 102 patients (16% of the patients interviewed) who left the ED against medical advice (LAMA) were satisfied with their care. This means that near all of these patients were unsatisfied; they maybe went to another medical centre for continued treatment. On the other hand, for patients who were discharged by physicians or admitted to a ward the satisfaction rates were 68.85% and 80.58% respectively. Of the patients who had a university degree, 24.14% were satisfied with their treatment while 18.77% of those without a university degree were satisfied. This difference was not, however, statistically significant (P = 0.110). A total of 52.92% of female patients were satisfied with their treatment. Although they had less concerns than males, this difference was not statistically significant (P = 0.141).

Table 2 shows the relationship between patient characteristics and patient concerns. Females had greater concerns about improper diagnosis, being mistaken for another patient and falling from a hospital bed, while males were worried about

Table 2: Relationship between patient characteristic and patient concerns

	Gender (male/ female)	Insurance (without) %	University degree (+)%	Disposition (LAMA) %	%Age (worried/ not worried) mean
Worried about at least one medical error	54.54 / 45.46 *P* = 0.056	42.86P = 0.674 +, *P* = 0.674	28.9 +, *P* <0.001*	21.42 +, *P* <0.001*	41.01 / 39.86 ~, *P* = 0.433
Prolonged ED stay	47.93 / 52.07 *P* = 0.725	23.96 +, *P*<0.001	23.14 +, *P* = 0.759	20.66 +, *P* = 0.119	37.74 / 41.04 ~, *P* = 0.078
Medical student related error	52.95 / 47.05 *P* = 0.388	47.05 +, *P* = 0.216	29.1 +, *P* = 0.163	21 +, *P* = 0.098	44.29 / 39.53 ~, *P* = 0.017*
Errors with equipment malfunction	89.1 / 10.9 *P* <0.001*	61.82 +, *P* = 0.002*	10.9 +, *P* = 0.036*	14.55 +, *P* = 0.760	27.3 / 41.65 ~, *P* <0.001*
Improper diagnosis	28.89 / 71.11 *P* = 0.004*	64.45 +, *P* = 0.002*	46.66 +, *P* <0.001*	35.56 +, *P* <0.001	41.64 / 40.32 ~, *P* = 0.646
Injury due to fall from hospital bed	25 / 75 Chi2, +, *P* = 0.003*	22.23 +, *P* = 0.013*	13.9 +, *P* = 0.222	0 #, *P* = 0.004*	50.3 / 39.52 ~, *P* <0.001*
Physician' fault in management	72.41 / 27.59 *P*=0.011*	58.62 +, *P* = 0.064	44.82 +, *P* = 0.003*	27.58 #, *P* = 0.081	37.31 / 40.56 ~, *P* = 0.077
Being mistaken for another patient	14.29 / 85.71 *P* = <0.001*	0 #, *P* <0.001	0 #, *P* = 0.004*	0 #, *P* = 0.018*	47.42 / 40.02 ~, *P* = 0.001*
Laboratory mistake	52.95 / 47.05 *P* = 0.766	52.94 +,*P* = 0.355	29.41 +, *P* = 0.461	23.53 #, *P* = 0.332	37.52 / 40.49 ~, *P* = 0.208
Nursing mistake	100 / 0 *P* = 0.042*	100 #, *P* = 0.018*	0 #, *P* = 0.285	100 #, *P* = 0.001*	35 / 40.45 ~, *P* <0.001*

*Note: *statistically significant. Statistical tests used: + = chi²; # = Fisher's exact; ~ = T test.*
Legend: SD = standard deviation; ED = emergency department; LAMA = left against medical advice.

nursing mistakes, equipment malfunction and physician error. Patients with university degrees were markedly more worried about physician error, being mistaken for another patient and improper diagnosis, but less worried about equipment malfunction. Older participants were more worried about medical student error, falling from a hospital bed and being mistaken for another patient, but younger patients were more concerned about equipment malfunction and nursing mistakes. Some of the patients left the hospital without completing the diagnosis or treatment process. They were significantly more worried about improper diagnosis and nursing mistakes.

We conducted a multivariate analysis and found that female gender, leaving the ED against medical advice and having a university degree were independently predictive of having at least one concern about a medical error. Also, multivariate analysis demonstrated that having insurance, being discharged or admitted by a physician and having a university degree were independently predictive of high satisfaction [Tables 3 and 4]. There was a clear relationship between the general satisfaction rate and having at least one concern about a medical error (chi-square, *P* <0.001).

Discussion

Most of the time, EDs have too many acutely ill patients. This situation can be highly stressful for physicians, very disturbing for patients and lead to medical error. This study was conducted to evaluate the patient concerns about medical errors during their visit to the ED. In spite of overcrowding in our ED, the majority of patients expressed satisfaction with the medical care they received during their visit although 48.3% of them were concerned about occurrence of one medical error. In the study by Burroughs, 38% of patients experienced error related concerns.[1] In other studies, the reported "medical error anxiety" rate was much higher.[11,15]

The following factors are suggested as the causes of the greatest concern about medical error which ultimately result in more dissatisfaction: severity of illness or pain; uncertain clinical diagnosis; prolonged ED stay; unclear or insufficient

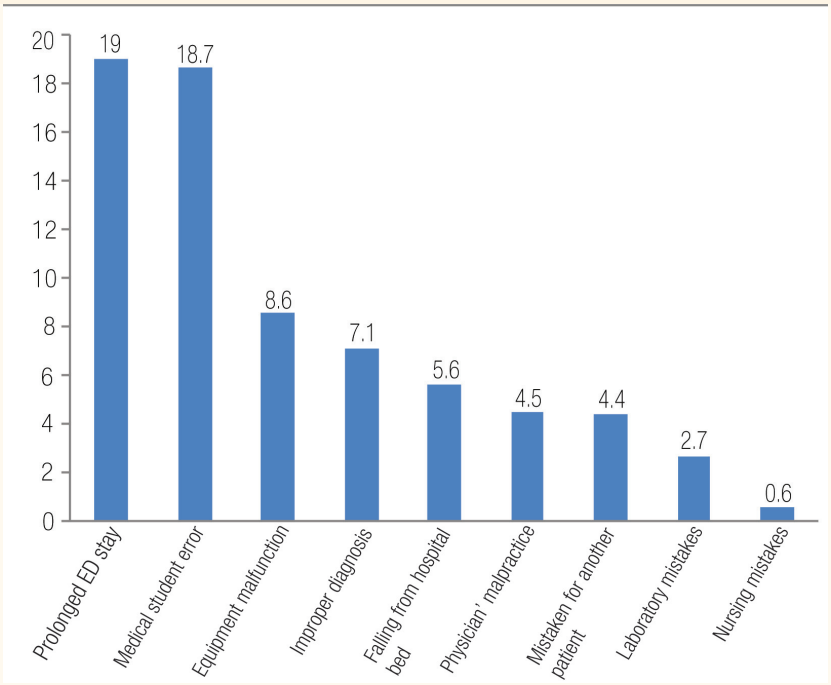

Figure 1: Patients' concerns about medical errors during emergency department visit.

explanation from nursing or physician, and unclear management plan[16–20] In our study, younger patients were more concerned than the older ones. This finding is similar to the Burroughs study.[1] We surmise that the reason for this may be that elderly patients likely have more previous ED experiences and their illness may be less unexpected. In our study, patient concerns were correlated with length of ED stay. However, Thompson *et al.* reported that opinions regarding perceived waiting time rather than actual waiting time were correlated with patient satisfaction.[21]Although the ED length of stay was influenced by factors such as seriousness of illness, overcrowding, and the shortage of ED staff in relation to patient numbers, the probability of medical error occurrence increases with more prolonged ED stays.[1] It has been shown that providing the public with ED waiting time information can reduce lengthy ED waiting times.[22] Concerns about falling from a hospital bed were greater in older patients. This may originate from motor or equilibrium problems in this age group. Patient concerns had a direct relationship to educational levels. More educated patient had more complaints and paid more attention to the likelihood of medical errors. Patients who were discharged home were less concerned than the others, both on

Table 3: Multivariate analysis (binary logistic regression) predictive of being concerned about at least one medical error

	B	SE	*P* value	Exp (B) (95% CI)
Male	-0.347	0.163	0.033	0.707 (0.513–0.973)
LAMA	0.824	0.228	<0.001	2.28 (1.458–3.565)
Not having university degree	-0.778	0.199	<0.001	0.459 (0.311–0.678)
Constant	0.580	0.197	0.003	1.78

Legend: SE = standard error; CI = confidence interval; LAMA = left against medical advice.

Table 4: Multivariate analysis (binary logistic regression) predictive of high satisfaction

	B	SE	*P* value	Exp (B) (95% CI)
Not having university degree	-0.632	0.254	0.013	0.531 (0.323–0.874)
LAMA	-4.295	0.524	<0.001	0.014 (0.005–0.038)
Having insurance	0.588	0.194	0.003	1.80 (1.229–2.634)
Constant	1.160	0.245	<0.001	3.190

Legend: SE = standard error; CI = confidence interval; LAMA = left against medical advice.

initial interview and at 7-day follow-up. As patients' management could be influenced by factors such As the severity of their illnesses, it may have biased the patients' level of concern. One common concern was the possibility of errors by medical students. A possible solution to this concern would be to inform patients about the advanced capability and sophisticated training which medical students receive before they work in clinical wards, and to underline that all student work is supervised by attending physicians. Another way to decrease concerns about student error would be to improve the knowledge and clinical expertise of medical students themselves in order to make them more proficient and self-confident. This is important as two studies found that patients were unwilling to have procedures done by medical students.[23,24]

Worries about medication mistakes have been found to be one of the major and fundamental reasons for patient concern.[25] In the current study, the patients were not significantly worried about this error. Most errors were due to diminished attention levels occurring during prescribing, dispensing or administering drugs.[26] Collaboration with the clinical pharmacist can reduced harmful medication error.[27]

There is a significant relationship between the level of patient concerns and their satisfaction. More satisfied patients were less concerned about medical errors. Our results were consistent with previous studies.[1,7] According to some studies, expanding patient involvement in medical care, teaching physicians about error disclosure techniques, and honesty and compassion were effective and valuable ways to avoid medical errors and increase patient satisfaction.[28–31] Although informing patients about the nature and origin of medical errors is valuable, it is not possible in a stressful environments like ED. Regarding the influence of background anxieties on satisfaction in a majority of patients admitted to EDs,[32] a timely recognition of their situation is mandatory.

Although our study has valuable results about types of concerns, our suggestion is to repeat the study in other university hospital EDs, community, or private hospitals to compare the results for patients with different illnesses. Personal characteristics such as psychological, emotional and social factors, which were not considered in this study, could influence the level of patients' concerns. Proper attention to these factors in future studies and also to other clinical situations may further define the factors contributing to patient concerns about medical errors.

Conclusion

Recognition of patient concerns and addressing them in a timely fashion appear to be an effective strategy for improving patient safety and satisfaction.

CONFLICT OF INTEREST

The authors declared no conflict of interest

References

1. Burroughs TE, Waterman AD, Gallagher TH, Waterman B, Adams D, Jeffe DB, et al. Patient concerns about medical errors in emergency departments. Acad Emerg Med 2005; 12:57–64.
2. Taylor TB. Threats to the health care safety net. Acad Emerg Med 2001; 8:1080–7.
3. Velianoff GD. Overcrowding and diversion in the emergency department: The health care safety net unravels. Nurs Clin North Am 2002; 37:59–66.
4. Risser DT, Rice MM, Salisbury ML, Simon R, Jay GD, Berns SD. The potential for improved teamwork to reduce medical errors in the emergency department. Ann Emerg Med 1999; 34:373–83.
5. National Patient Safety Foundation. Patient Safety: Your Role in Making Healthcare Safer. Chicago, IL: National Patient Safety Foundation, 2002.
6. The Kaiser Family Foundation/ Agency for Healthcare Research and Quality. National Survey on Americans as Health Care Consumers: An Update on the Role of Quality Information. Washington, DC: Agency for Healthcare Research and Quality, Dec 2000.
7. Burroughs TE, Waterman AD, Gallagher TH, Waterman B, Jeffe DB, Dunagan WC, et al. Patients' concerns about medical errors during hospitalization. Jt Comm J Qual Patient Saf 2007; 33:5–14.
8. Hickson GB, Clayton EW, Githens PB, Sloan FA. Factors that prompted families to file medical malpractice claims following perinatal injuries. JAMA 1992; 267:1359–63.
9. Levinson W, Roter DL, Mullooly JP, Dull VT, Frankel RM, et al. Physician-patient communication: The relationship with malpractice claims among primary care physicians and surgeons. JAMA 1997; 277:553–9.
10. Schenkel S. Promoting patient safety and prevention error in emergency department. Acad Emerg Med 2000; 7:1204–22.
11. Thiagarajan RR, Bird GL, Harrington K, Charpie

JR, Ohye RC, Steven JM, et al. Improving safety for children with cardiac disease, Cardiol Young 2007;17:127–32.

12. Hedges JR, Trout A, Magnusson AR. Satisfied patients exiting the emergency department (SPEED) study. Acad Emerg Med 2002; 9:15–21.
13. Sun BC, Adams JG, Burstin HR. Validating a model of patient satisfaction withemergency care. Ann Emerg Med 2001; 38:527–32.
14. Trout A, Magnusson AR, Hedges JR. Patient satisfaction investigations and the emergency department: What does the literature say? Acad Emerg Med 2000; 7:695–709.
15. Byrne G, Heyman R. Patient anxiety in the accident and emergency department. J Clin Nurs 1997; 6:289–95.
16. Boudreaux ED, Frieman J, Chansky ME, Baumann BM. Emergency department patient satisfaction: Examining the role of acuity. Acad Emerg Med 2004; 11:162–8.
17. 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.
18. Aragon SJ, Gesell SB. A patient satisfaction theory and its robustness across gender in emergency departments: A multigroup structural equation modeling investigation. Am J Med Qual 2004; 18:229–41.
19. Arendt KW, Sadosty AT, Weaver AL, Brent CR, Boie ET. The left-without-being-seen patients: What would keep them from leaving? Ann Emerg Med 2003; 42:317–23.
20. Sun BC, Burstin HR, Brennan TA. Predictors and outcomes of frequent emergency department users. Acad Emerg Med 2004; 10:320–8.
21. Thompson DA, Yarnold PR, Williams DR, Adams SL. Effects of actual waiting time, perceived waiting time, information delivery, and expressive quality on patient satisfaction in the emergency department. Ann Emerg Med 1996; 28:657–65.
22. Xie B, Youash S. The effects of publishing emergency department wait time on patient utilization patterns in a community with two emergency department sites: A retrospective, quasi-experiment design. Int J Emerg Med 2011; 4:29.
23. Graber MA, Pierre J, Charlton M. Patient opinions and attitudes toward medical student procedures in the emergency department. Acad Emerg Med 2003; 10:1329–33.
24. Graber MA, Wyatt C, Kasparek L, Xu Y. Does simulator training for medical students change patient opinions and attitudes toward medical student procedures in the emergency department? Acad Emerg Med 2005; 12:635–9.
25. Jenkins G, Johnston PE, Patel NR, Jones I, Aronsky D. The epidemiology of medication prescribing errors in the emergency department. AMIA Annu Symp Proc 2006:968.
26. Nichols P, Copeland T, Craib I, Hopkins P, Bruce DG. Learning from error: Identifying contributory causes of medication errors in an Australian hospital. Med J Aust 2008; 188:276–9.
27. Rothschild J, Churchill W, Erickson A, Munz K, Schuur JD, Salzberg CA, et al. Medication errors recovered by emergency department pharmacists. Ann Emerg Med 2010; 55:513–21.
28. Hobgood C, Peck CR, Gilbert B, Chappell K, Zou B. Medical errors - what and when: What do patients want to know? Acad Emerg Med 2002; 9:1156–61.
29. Greenfield S, Kaplan S, Ware JE. Expanding patient involvement in care. Effects on patient outcomes. Ann Intern Med 1985; 102:520–8.
30. Benbassat J, Pilpel D, Tidhar M. Patients' preferences for participation in clinical decision making: A review of published surveys. Behav Med 1998; 24:81–8.
31. Hoffmann B, Rohe J. Patient safety and error management. Dtsch Arztebl Int 2010; 107:92–9.
32. Nirenberg TD, Baird J, Harrington M, Mello MJ, Woolard R, Longabaugh R. A cross sectional study of the self-report of stress among emergency department patients. J Emerg Trauma Shock 2009; 2:155–8.