

Understanding Interns' information needs in emergency departments

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Abstract

Objective: In teaching hospitals, the clinical encounter is an increasingly significant component of interns' curriculum and one of the clinical experiences of interns is emergency medicine. This research was conducted to provide new insights on interns' information needs in emergency departments.

Methods: This study examines the information needs of interns in the emergency departments of teaching hospitals in Iran University of Medical Sciences. Questionnaires and observations were used to collect data from seventy interns. Chi-square, two-tailed and bi-variation correlation tests were used to investigate the relationship among the data.

Results: It was observed that the most commonly asked questions related to patient specific information and fewer questions related to organizational questions such as hospital policies and procedures. The analysis revealed a statistically significant relationship (0.576, $P < 0.01$, two-tailed) between the interns' diagnostic and therapeutic questions. The interns reported that the majority of their information needs were laboratory (84%) and radiography (74%) results and the least of those were dead person transfer (1.4%) and medico-legal coordination (10%).

Conclusion: Results showed that the interns underestimated the importance of access to organizational information such as medico-legal and dead person transfer issues in the emergency departments. Findings also support the development of educational programmes to promote student knowledge about organizational information and medico-legal issues in the emergency departments.

Introduction

Hospitals are complex and information rich environments in which collaboration is important to provide appropriate patient care.

In these environments, patient care departments are becoming an essential component of medical care (Baggs *et al.*, 1992; Yeoh, 2000). One of them is the Emergency Department (ED). Emergency departments are fast-paced, information-intensive environments where patient care team members must address their information needs quickly and accurately (Reddy & Ruma Spence, 2006; Lappa, 2005). In teaching hospitals, the clinical encounter is an increasingly significant component of interns' curriculum (Cogdill & Moore, 1997; Celenza, 2006) and one of the clinical experiences of interns is emergency medicine (Ling *et al.*, 1997; Kelly & Ardagh, 1994). In fact, the practice of emergency medicine is the ability to perform indicated clinical procedures in a skillful and safe manner (Vander Vlugt & Harter, 2002; David *et al.*, 1997). Due to multiple factors, including the unpredictable nature of emergency medicine, clinical experience may be quite variable. So clinical

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experience in the ED is the foundation of emergency medicine (Johnson *et al.*, 2002; Hockberger *et al.*, 2001; Manthey *et al.*, 2006; Shepherd *et al.*, 1990). Thus, all interns who graduate from medical school should be capable of handling emergency situations (Celenza *et al.*, 2001; De Lahunta & Bazarian, 1998). While the clinical encounter is understood to be a significant educational experience, little is known about the information of interns in response to clinical problems, especially in emergency departments.

Authors including Taylor (1968), Bertulis and Cheeseborough (2008) explained the need for information in four steps: "visceral need", "conscious need", "formalized need", and "compromised need". The visceral need is an unexpressed need, but it becomes a conscious need when a person creates a mental description of it. A person then formalizes the need into a rational statement and may seek an answer to it by using an information system, transforming it into a compromised need. Usually, we refer to the latter three needs when we say "information needs". Nicholas (1996) pointed out that the information needs arise when a person recognizes a gap in his/her state of knowledge and wishes to resolve that anomaly.

Recent studies have investigated the nature of physicians' information needs and how these needs are managed. Covell *et al.* (1985) developed a methodology that placed the researchers in ambulatory care practices for half-day site visits during which physicians indicated any information need which was related to each patient encounter. Results of this study suggest that clinicians articulate an average of two information needs for each three patients seen, but that only 30% of questions are resolved at the time of the patient visit. To date, many studies address physicians' information needs but few authors report studies describing interns' information needs in the emergency department. The present study differs from most of the past studies as it aims to analyze and understand the information needs of interns rather than the clinicians. This study can have an impact on the quality of clinical education, the recognition of interns' education needs, education improvement in emergency and better management of patients by interns that decreases patient's stay and promotes patient satisfaction.

Methods

This study examines the information needs of interns in the emergency departments at three teaching hospitals (Rassol Akram, Firoozgr and Hashemi Nezhad) affiliated with Iran University of Medical Sciences in Tehran, 2008. The selection of the sites was based on location and setting diversity (teaching, general and special hospitals). The study was approved by Management and Medical Informatics School Research Board.

Questionnaires and observations were used during the course of the study. In observation, the work of the interns was observed on all shifts to assess their information needs. They were asked to indicate their willingness as a volunteer. Informed consent was obtained and the interns were subsequently observed. The patients gave their consent to the observation of the encounter. During the observations, questions were noted as they were asked by the interns. Following a review of the literature, a survey instrument was developed that included seventeen questions related to demographics, the content and the rate of information needs. A covering letter described the aims of the study, explained that response to the survey implied consent to participate, and the participants were assured that all individual responses would be kept confidential.

A pilot version of the questionnaire was sent to 20 randomly selected interns. The final version of the anonymous questionnaire was given to all interns of emergency departments. The twenty pilot study participants were excluded. The data were interpreted based on observation reports and from the questionnaires. Data were put into two categories; (1) content of the interns' information needs (2) the rate at which types of information needed.

The categorization of interns' questions was based on the content of them, such as diagnostic, therapeutic and organizational. The categorization of the rate of information was as low, moderate and high. Inter-rater reliability for the categories was found to be highly (0.80). Analysis of questionnaire data was conducted using SPSS; Chi-square, two-tailed and bi-variation correlation tests were used to investigate significant relationships among the data.

Results

70 interns participated in the study; 45 (64%) were male. 350 different questions were noted during our observations. The questions were used to identify the unmet information needs of interns. The questions were used to identify the unmet information needs of interns. The questions pertained to diagnosis, treatment and organizational information. 147 (42%) of questions pertained to diagnosing the patient's problem. Organizational questions such as hospital policies and procedures made up a lesser portion of the questions asked by the interns (Figure 1). The analysis revealed a

statistically significant relationship (0.576, $P < 0.01$, two-tailed) among the interns' diagnostic and therapeutic questions (Figure 2). The interns reported that the majority of their information needs were laboratory $n=59(84.3\%)$ and radiography $n=52(74.3\%)$ results and the least of them were dead persons transfer $n=1(1.4\%)$ and medico-legal coordination $n=7(10\%)$. The chi-square analysis revealed a statistically significant relationship of the need rate when compared to radiography, laboratory and drug treatment results ($P < 0.01$) (Table1).

Figure1: type of question

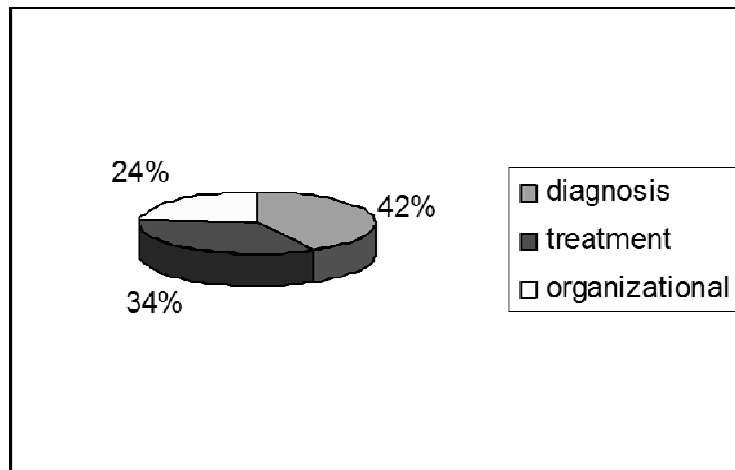


Figure2: need rate to type of question

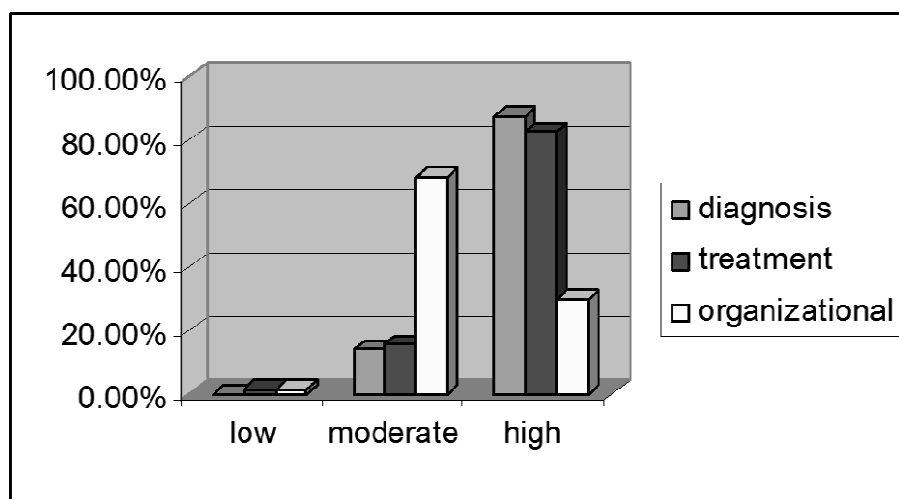


Table 1: Rate of information needs

Rate of need	Low	moderate	high
Information need	N(%) (total = 70)		
Triage	5(7.1)	27(38.6)	38(54.3)
Result of CPR	8(11.4)	24(34.3)	38(54.3)
Primary procedures	3(4.3)	15(21.4)	52(74.3)
Patient identification	24(34.3)	30(42.9)	16(22.9)
Death confirmation	13(18.6)	32(45.7)	25(35.7)
Drug order and care procedures	5(7.1)	14(20)	51(72.9)
Body transfer	55(78.6)	14(20)	1(1.4)
Medico-legal coordination	52(74.3)	11(15.7)	7(10)
Radiography results	4(5.7)	14(20)	52(74.3)*
Laboratory results	4(5.7)	7(10)	59(84.3)*
Drug treatment results	6(8.6)	13(18.6)	51(72.9)*
Patient transfer	11(15.7)	42(60)	17(24.3)
Nursing procedures	13(18.6)	26(37.1)	31(44.3)
Patient transfer order	15(21.4)	39(55.7)	16(22.9)
Patient discharge status	13(18.6)	30(42.9)	27(38.6)

* P<0.01

Discussion

The results of this study provide a better understanding of interns' information needs in the emergency department and describe the information needs in response to a clinical encounter. A complete understanding of these factors is increasingly important, as many medical schools develop curricula that rely on problem-based learning (Cogdill & Moore, 1997; Kelly, 2000). In ED, the goal is, in most cases, to identify the patient's problem (Kolker, 2008; Vander Vlugt & Harter, 2002; DeBehnke *et al.*, 1995). Findings showed that the most interns' questions about the admitted patients were clinical questions. In this study, like those of experienced clinicians, interns' information needs most often pertain to diagnosing a problem or choosing a treatment option.

Cogdill and Moore (1997) examined the first-year interns' information needs in response to a clinical scenario. They found that the majority of interns' questions was related to diagnosis and treatment. Covell *et al.* (1985) examined the information needs of 47 physicians and found that they focused on patient-care questions at work. Interns, who work in environments such as an emergency departments, depend on finding accurate information quickly and efficiently in order to

provide care to their patients (James 1921; DeBehnke *et al.*, 1995). The observations showed interns' questions were often asked because of a breakdown in the information flow. Although some questions were asked to elicit opinions or confirm order, many questions were asked because the interns *did not receive* the needed information to make or implement a decision. Speed is essential in ED (Kulkarni, 2007; Trott & Blackwell, 1992). Quickly obtaining answers to questions regarding coordination is of the utmost importance because these answers allow the interns to work effectively and efficiently (Vieth & Rhodes, 2006; Humphris & Kaney, 2001).

However, the observations during the study showed that the breakdown in the information flows in the department occurred for three reasons. Firstly, the information was not available when expected. For instance, a laboratory result was not ready when the interns expected it and they had to ask the unit secretary about the results. Secondly, the information was either incorrect or incomplete. Therefore, interns had to ask questions to find the correct or complete information. Finally, the information was delivered to the wrong person. Each of these situations had the potential to compromise patient care if not quickly resolved.

Clinical work of the emergency department occurs within a particular organizational framework (Collinson & Turner, 2002; Burdick, 1991). Therefore, it is important for interns to meet their organizational information needs. However, only 24 % (n=84) of the questions noted during observations related to hospital policies, procedures, coordination and management issues. In ED the answer to the organizational questions enabled the interns to function more effectively and keep the unit running smoothly (James 1921). The low occurrence of organizational questions among interns indicates a few interns had understood the importance of the interrelationship between clinical and organizational aspects of work in clinical units. For these interns, it was not sufficient just to find clinical information because the clinical information by itself did not always allow them to complete their activities. For instance, in the emergency department, interns often asked organizational questions about their work in order to coordinate the clinical care of the patient.

The interns in this study reported that they had high need for laboratory and radiography results. This study indicated that 42% questions pertained to diagnosis, thus interns must have high need for these results because they support the interns to work out the diagnosis. The results revealed a significant correlation among need rate to radiography, laboratory and drug treatment results. In other words, those who had higher need to laboratory and radiography results also had higher need to drug treatment result. The opposite was true for those who had low need to laboratory and radiography results. Usually Physicians' drug orders are based on diagnostic procedures results and drug treatment results indicating clinical diagnosis quality of the physician (Reddy & Ruma Spence, 2006). This study showed that medico-legal issues were not important for the majority interns, as only 10% (n=7) reported a high need for this information. Since medico-legal affairs are paramount in some patients referred to the emergency department, it is important that interns consider them.

Limitations to our study include focus on interns in ED, which may not be generalized to other departments. The EDs were chosen based on close proximity to the researchers' institution. The specific geographic location and the small sample size, may also be a limitation to generalizing the findings to interns in other emergency departments in Tehran or in other medical sciences universities in other

states. However similarities between the current results and intern information needs in other studies point to commonality of challenges and preferences among interns, perhaps independent geographic location.

Conclusion

This research has addressed a number of questions related to information needs of interns in emergency department. As in previous studies, interns in the current study regularly experience information needs as a result of encounters with patients. Results point to the type of questions and need rate of the interns to them and pointing to the importance of organizational information. Though there is a strong connection between organizational and clinical questions in the emergency department, the interns perceive fewer organizational information needs and medico legal aspects in the emergency department. We are starting to identify a set of common categories of interns' information needs. These categories expand our understanding of the different types of their information needs in information-intensive and time-stressed environments. This study has the important issues for intern educators. Educational programs aiming to promote the interns' awareness about organizational information and medico legal issue must be provided in medical schools. Medical school is an ideal setting to teach and practice procedural skills because interns have fewer direct patient-care responsibilities and more time to ask questions and practice, especially in settings other than at the bedside.

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