

## Original Article

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## Waiting Time for Specialist Consultation and Visit Requested in the Emergency Department; a Cross-Sectional Study

Ehsan Hajzargarbashi<sup>1</sup>, Rakhshan Rashedi<sup>1\*</sup>, Seyedmehdi Pourafzali<sup>2</sup>, Mehrdad Esmailian<sup>3</sup>

1. School of Medicine, Islamic Azad University (Najafabad Branch), Isfahan, Iran.

2. School of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.

3. Department of Emergency Medicine, Al-Zahra Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran.

\*Corresponding author: Rakhshan Rashedi; Email: [drakhshan.rashedi@gmail.com](mailto:drakhshan.rashedi@gmail.com)

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### Abstract

**Introduction:** Waiting time in the hospital directly affects the quality of healthcare providing centers. One of the waiting times in hospital is the time spent waiting for receiving various consultations and visits requested by emergency medicine specialists from specialist services.

**Objective:** The present study was designed and performed to assess the waiting times for receiving specialist visits and consultations requested in the emergency department based on the corresponding service in a referral hospital in Isfahan, Iran.

**Method:** In the present cross-sectional study, patients presenting to emergency department of Dr. Shariati Hospital, Isfahan, Iran, from October 2017 to March 2018, who were in need of visit or consultation from other specialist services based on the opinion of the emergency medicine specialist, were studied. By attending the patients' bedside, the researcher filled out a checklist consisting of demographic data and waiting time of the patients and other probable related factors. Finally, raw data were entered to the computer and after correction of errors were statistically analyzed via SPSS software.

**Results:** Overall, 400 patients with the mean age of  $53.3 \pm 24.3$  years were included in the study, 58.8% of which were male. Mean waiting time for receiving a visit or consultation among the studied patients was  $242.0 \pm 202.4$  (min: 5 and max: 1200) minutes. Mean waiting time for a visit or consultation did not significantly correlate with the corresponding physician being resident or on-call. However, it showed a statistically significant correlation with triage level ( $p = 0.013$ ), work shift ( $p = 0.000$ ), type of service requested/the specialist service asked for a consultation or visit ( $p = 0.049$ ), and the consultation or visit being emergent or non-emergent ( $p = 0.000$ ). In addition, emergent visits or consultations by on-call physicians had been performed significantly faster than those by resident physicians; while non-emergent visits or consultations by resident physicians had been performed significantly faster than those by on-call physicians ( $p = 0.001$ ).

**Conclusion:** The results of the present study showed that patients with triage level 2, emergent visit of consultation and a visit or consultation request in the morning or evening shift wait a shorter time for receiving the visit or consultation. In addition, neurosurgery, nephrology, and pediatrics services had the shortest waiting times, while gastroenterology, gynecology, and infectious disease services had the longest waiting times for giving the visit or consultation requested from them.

**Key words:** Appointments and Schedules; Emergency Service, Hospital; Patients

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### INTRODUCTION

The emergency department is the most important department in every hospital, the most important responsibility of which is providing emergency medical services at any time of the day. Long term stay of patients in this department leads to dissatisfaction of the patients and disturbance in performance of this department. Therefore, one of the most important indices used for assessing the function of emergency departments is the waiting time of patients for receiving diagnostic and

treatment services (1, 2). Waiting for a long time in order to receive services is a very common problem in emergency departments in hospitals all over the world. Waiting time is the time interval that patients presenting to the emergency department spend there for whatever reason. Long wait puts the safety of the patient at risk and brings about negative outcomes; it affects the quality of care, decreases patient satisfaction and increases the number of patients who leave the hospital

before being visited (3). Elongation of patients' stay in the emergency department leads to unnecessary occupation of beds and takes up time from the staff. It also negatively affects the admission of new patients and brings about overcrowding of patients, which may result in both new and previously admitted patients not receiving adequate care (4). One of the important treatment steps affecting waiting time is the time spent waiting for various consultations requested by emergency medicine specialists for diagnosis or treatment, or dislocation of the patients from various specialist services. The time wasted for performance of each of these consultations may vary depending on the type of specialist service, the number of present attends in the service, presence or absence of resident or on-call in those services, or other intra-departmental factors. Therefore, in the present study, efforts have been made to determine the waiting time for the visits and consultations by specialists in each service and compare them. By using the services with low waste of time as a template and studying their intra-departmental characteristics, solutions could be proposed to services with a high waste of time for reducing the overall waiting time of patients in the diagnostic and treatment process in the emergency department.

## METHODS

### *Study design*

The present cross-sectional study was performed from October 2017 to March 2018 in Dr. Shariati Hospital, Isfahan, Iran. The protocol of the present study was approved by the ethics committee of faculty of medicine, Islamic Azad University. Performing the present study did not impose any additional costs on the healthcare system. In order to keep data confidential, all cases were used without mentioning the name or family name of the patient and data were solely used for the purpose of performing the study. Patients were enrolled in the study if they gave informed consent and were given the right to withdraw from participating in the study at any time and their withdrawal did not impact their treatment and relationship with the treatment staff and nurses.

The patient admission process in the emergency department of Dr. Ali Shariati Hospital in Isfahan is as follows: all the patients presenting to emergency department are examined and triaged by a general physician, then they are visited by emergency medicine specialists and according to their needs, patients are either monitored, referred to the operating room or other departments or

discharged. In addition, based on the opinion of the in-charge emergency medicine specialist, visit or consultation with other specialist services may be requested for the patient, then by notifying the corresponding specialist, they will attend the patient's bedside and the requested visit or consultation is done.

### *Study population*

The study population of this study consisted of patients who presented to the emergency department of the studied hospital from October 2017 to March 2018 and needed visits or consultations from other specialist services based on the opinion of the senior emergency physician or the emergency medicine specialist.

Missing data in the patient's profile, discharge against medical advice before receiving consultation or visit by the corresponding specialist service, change in the corresponding specialist service of the patient by the cardiologist or the senior emergency physician, or death of the patient before consultation or visit by the corresponding specialist service before the passing of the interval defined for consultation or visit based on the protocol of the hospital were considered as exclusion criteria. Required sample size was calculated as 385 patients using the formula for sample size estimation for cross-sectional studies considering 95% confidence interval, 80% test power, and accepting sampling error of 0.16; for more confidence, 400 patients were included in the study. Convenience sampling was applied for this study.

### *Data gathering*

The tool used in the present study was a checklist consisting of the patients' demographic data (including sex, age, chief complaint, accurate date and time of hospitalization) and other information related to visit request (work shift, accurate time of request, type of specialist service, the accurate time of consultation being done, the consultation being emergent or non-emergent, the consulted specialist being on-call or resident, and triage level of the patient). The researcher attended the patients' bedside in person and recorded the required data in the checklists.

### *Statistical analysis*

Data resulting from the present study were statistically analyzed via SPSS software version 23. Qualitative results were reported as absolute and relative frequency and quantitative results as mean  $\pm$  standard deviation (SD). In analyzing results, Chi square, Independent T test, and Pearson's correlation coefficient were used. Significance level of P was considered to be less than 0.05.

**Table 1:** Demographic data and baseline characteristics of the studied patients

Variable	Number (%)
<b>Sex</b>	
Male	235 (58.8)
Female	165 (41.3)
<b>Age (year)</b>	
< 18	32 (8.0)
18-60	192 (48.0)
> 60	176 (44.0)
<b>Triage level</b>	
Level 2	160 (40.0)
Level 3	240 (60.0)
<b>Work shift</b>	
Morning	119 (29.8)
Evening	106 (26.5)
Night	175 (43.8)
<b>Consultation type</b>	
Emergent	24 (6.0)
Non-emergent	376 (94.0)
<b>Consultation with</b>	
Surgeon	42 (10.5)
Internist	105 (26.3)
Gynecologist	11 (2.8)
Pediatrician	22 (5.5)
Orthopedist	17 (4.3)
Urologist	9 (2.3)
Cardiologist	53 (13.3)
Neurologist	47 (11.8)
Neurosurgeon	6 (1.5)
Infectious disease specialist	52 (13.0)
Gastroenterologist	9 (2.3)
Nephrologist	13 (3.3)
Anesthesiologist	7 (1.8)
Otorhinolaryngologist	4 (1.0)
Ophthalmologist	2 (0.5)
Psychiatrist	1 (0.3)

## RESULTS

From October 2017 to March 2018, 128 thousand patients had visited the emergency department of the studied hospital and a total of 35 thousand were hospitalized and a specialist visit or consultation was requested for more than half of the patients. Overall, 400 patients with the mean age of  $53.3 \pm 24.3$  years (min: 8 months and max: 97 years) were evaluated in the present study, out of which 235 (85.8%) were male. Based on the findings, most patients were in the 18-60 years age range. In addition, the status of consultation or visit requested was emergent in 24 (6.0%) patients and non-emergent in 376 (94.0%). The highest number of requested consultations corresponded to internal medicine, cardiology, and infectious diseases services, respectively. Demographic data of these patients have been presented in table 1.

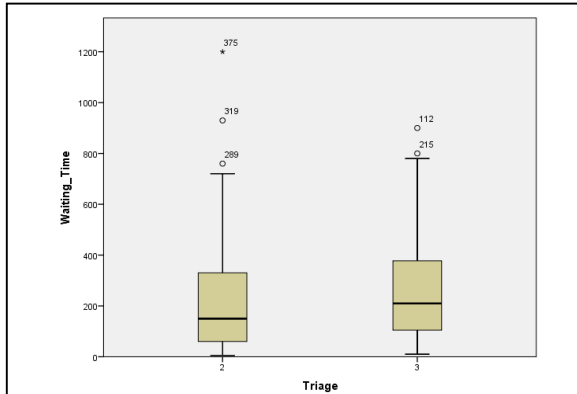
Mean waiting time for receiving a visit or consultation in the studied patients was  $242.0 \pm 202.4$  (min: 5 and max: 1200) minutes. There was no significant correlation between waiting time for consultation and age ( $P = 0.969$ ) or sex ( $P = 0.62$ ). Mean waiting time for visit of consultation for the studied patients with triage level 2 was  $209.8 \pm 200.6$  minutes, while it was reported to be  $260.0 \pm 192.2$  minutes in patients with triage level 3 (figure 1), the difference between which was statistically significant ( $p = 0.013$ ). This means that patients with triage level 2 waited a shorter time for receiving a specialist visit or consultation compared to those with triage level 3.

Mean waiting time for receiving an emergent visit or consultation was  $130.8 \pm 112.7$  minutes among the studied patients, while for patients that a non-emergent visit or consultation was requested, a waiting time of  $248.1 \pm 198.2$  minutes was reported (figure 2) and this difference was statistically significant ( $p = 0.000$ ). This means that patients with an emergent visit or consultation request had waited a significantly shorter time for receiving a visit or consultation compared to patients with a non-emergent visit or consultation request.

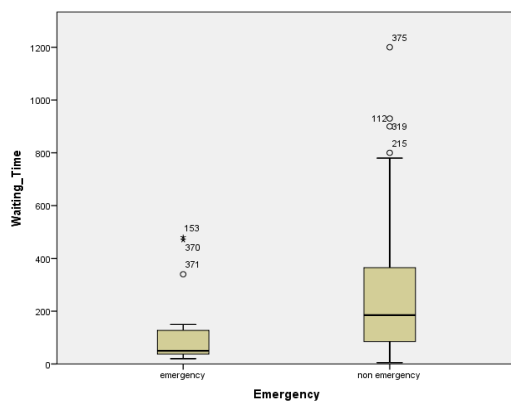
Additionally, mean waiting time for receiving an emergent visit or consultation by resident physicians was  $144.3 \pm 134.0$  minutes, while this time was reported as  $116.8 \pm 92.1$  minutes for on-call physicians. Moreover, mean waiting time for receiving a non-emergent visit or consultation was reported as  $226.2 \pm 176.4$  minutes for resident physicians and  $268.9 \pm 214.5$  minutes for on-call physicians ( $p = 0.001$ ).

Mean waiting time for receiving a visit or consultation in the studied patients was  $170.4 \pm 157.8$  minutes for patients whose visit or consultation request time was the morning shift,  $180.8 \pm 117.4$  minutes for those whose visit or consultation request time was the evening shift, and  $322.6 \pm 227.5$  minutes for patients whose visit or consultation request time was the night shift (figure 3) ( $p = 0.000$ ). This significant difference was for the morning shift compared to the night shift and the evening shift compared to the night shift. This means that patients who had a visit or consultation request in the night shift waited for a longer time to receive the visit or consultation compared to those who had a request in the morning or evening shifts.

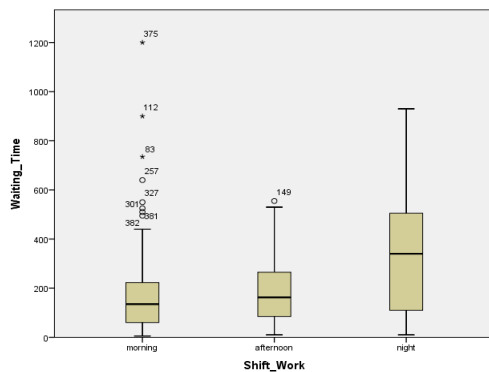
Mean waiting time for receiving a visit or consultation in the studied patients based on the corresponding physician being resident or on-call did not show a significant difference ( $p = 0.080$ ).



**Figure 1:** Mean waiting time for receiving a visit or consultation based on the patients' triage level



**Figure 2:** Mean waiting time for patients in order to receive a visit or consultation based on the status of the requested visit or consultation



**Figure 3:** Mean waiting time for receiving a visit or consultation in the patients based on the work shift of the visit or consultation request

But waiting time for a requested visit or consultation showed a significant statistical difference based on the type of service asked for a consultation or visit ( $p = 0.049$ ). According to the findings, the longest waiting times for receiving a requested visit or consultation belonged to gastroenterology, gynecology, and infectious

disease services, respectively; and the shortest waiting times for receiving a requested visit or consultation belonged to neurosurgery, nephrology, and pediatrics services. It should be noted that ophthalmology and psychiatry services were omitted from statistical analyses due to the very small number of consultation or visit requests.

**DISCUSSION**

Mean waiting time for the studied patients to receive a visit or consultation was about 4 hours; a time which is too long and considerable for some emergent diagnoses that are vital such as acute abdomen surgery, myocardial infarction and etc. Results of the statistical analyses of the present study did not show a significant statistical difference between mean waiting times of male and female patients. In addition, although mean waiting time for receiving a visit or consultation was shorter in patients under 18 years of age compared to those more than 18 years old, this difference was not statistically significant. In other words, the results of this study show that mean waiting time for receiving a visit or consultation does not have a significant correlation with age and sex of the patient.

The results of the present study did not show a statistically significant difference between mean waiting times for receiving a visit or consultation from resident and on-call physicians. In other words, the physician being resident or on-call did not affect the speed of visits or consultations, which is a result worth further studies and the causes such as structural weaknesses related to it must be evaluated and identified.

The present study showed that on average, patients with triage level 2 wait about 1 hour less than patients with triage level 3 for receiving consultations and visits. Considering that patients with triage level 2 have more urgency in their diagnosis and treatment process compared to patients with triage level 3, the obtained results are logical and indicate that specialists in the hospital pay more attention to visits and consultations requested for patients with triage level 2.

This study showed that patients with emergent requests for visit or consultation wait a shorter time for receiving them compared to patients with “non-emergent” requests for visit or consultation. On average, their waiting time was about 2 hours shorter than “non-emergent” requests. Since patients with “emergent” requests are in more urgency in their diagnostic and treatment process compared to patients with non-emergent requests, the obtained results seem logical and indicate that

hospital physicians paid more attention to “emergent” visits and consultations requested for patients. In addition, the present study showed that “emergent” visits and consultations by on-call physicians took a significantly shorter time compared to resident physicians, while “non-emergent” consultations given by resident physicians took a significantly shorter time compared to on-call physicians. This reveals that when the visit or consultation for a patient is labeled as “emergent”, it receives special attention from the physician and even when they are on-call, they will rapidly attend the patient’s bedside; in the present study the on-call physicians even reached the patient’s bedside 40 minutes faster than the resident physicians when visits and consultations were “emergent”. On the other hand, if the visit or consultation was “non-emergent”, resident physicians took a significantly shorter time to reach the patient’s bedside. This finding shows that resident physicians, although being present in the hospital, manage emergent visits or consultations slower; this may indicate the presence of structural weaknesses in the hospital.

In the official protocol of the studies hospital, standard time interval suggested for receiving an emergent visit or consultation in the emergency department is 30 minutes and the standard time for a non-emergent visit or consultation to be done in the emergency department is 120 minutes. However, in this study mean waiting time for receiving a visit or consultation in the emergency department was 112.7 minutes for emergent cases and 248.1 minutes for non-emergent cases; both of which are around twice the standard protocol of the hospital.

The present study showed that patients that had a request for visit or consultation in morning or evening shifts had a shorter waiting time compared to patients who had a visit or consultation request in the night shift. The mean difference between waiting times in the night shift and the morning or evening shifts was 3 hours. The reason for this could be the night shifts being longer and emergency department being overcrowded at night and therefore, the high number of those presenting to the emergency department in night shifts. Since the patients presenting to the emergency department at night are usually more critically ill, which is the reason that they visit the department at night, it seems that tending to the consultations and visits requested for them is vital and important. Yet, in the present study these patients had to wait about twice more than the patients in morning or evening shifts to receive

their requested visit or consultation. The waiting time for receiving a consultation or visit in patients with a visit or consultation request was not significantly different between morning and evening shifts.

Based on the results of the present study, the time that the patients in the emergency department waited for a requested visit or consultation to be done had a significant correlation with the type of service requested. In this regard, the results showed that visits and consultations requested from gastroenterology, gynecology, and infectious disease services had the longest waiting times (on average about 5 to 6 hours); on the other hand, visits and consultations requested from neurosurgery, nephrology, and pediatrics services (around 2 to 3 hours) had the shortest waiting times.

Considering the very important and life threatening emergencies that may occur in gastroenterology service (gastrointestinal bleeding, gastrointestinal obstruction, and ...), gynecology service (ectopic pregnancy, large and threatening ovarian cysts, and ...), and infectious disease service (sepsis and ...), it seems that long waiting times for a consultation or visit to be done by these services should be investigated and there is a need to evaluate the probable causes and rapidly solve them, because they threaten the life of the patient and lead to a higher mortality and morbidity in them and will also decrease the quality of performance in the emergency department of the hospital. A long waiting time in the emergency department obstructs desirable care and leads to wasting patients’ time, which causes their dissatisfaction.

A short waiting time for receiving a visit or consultation in neurosurgery, nephrology, and pediatrics services is indicative of the proper and desirable performance of these services in the emergency department, which seems necessary as there are very vital and emergent cases related to neurosurgery and pediatrics that require very rapid responses.

In addition, our study showed that anesthesiology and ENT services also have a relatively short waiting time indicating the desirable performance of these services. On the other hand, other services (surgery, orthopedics, internal medicine, urology, cardiology, and neurology) had an average waiting time (about 4 hours). This waiting time seems to be too long for cardiology and surgery services that usually correspond to patients with a critical status; thus, making an effort for reducing this time seems necessary. In emergency departments every

minute and every second is important for the patient and these times could determine if their final outcome is survival or death. Therefore, the waiting time of the patients in the emergency department for receiving any service is not only an important factor affecting the satisfaction of emergency patients, but is also one of the indices of evaluating the quality of services.

Finally, this study showed that patients with triage level 3, with a non-emergent visit or consultation request and patients in the night shift wait longer for a visit or consultation. In addition, patients that have a visit or consultation request from gastroenterology, gynecology, and infectious disease services also wait a long time for receiving the visit or consultation. Therefore, trying to find the causes of this increase in waiting time and attempting to decrease it seem necessary and can improve the quality of services provided in the emergency department.

It should be noted that in literature review of studies carried out in Iran as well as those performed in other countries, no study was found with the same aim as the present study. Therefore, an accurate comparison of the results with previous studies could not be done.

#### **Limitations**

The present study has been carried out in a single center and this affects the generalizability of the results.

#### **CONCLUSIONS**

In conclusion, the present study showed that

patients with triage level 2, emergent visit of consultation and a visit or consultation request in the morning or evening shift wait a shorter time for receiving the visit or consultation. In addition, neurosurgery, nephrology, and pediatrics services had the shortest waiting times, while gastroenterology, gynecology, and infectious disease services had the longest waiting times for giving the visit or consultation requested from them. Therefore, our study showed that among resident services, only pediatrics service had a proper performance regarding waiting time for giving visits or consultations and for instance, gynecology service, although being resident in the hospital, has one of the longest waiting times for giving a consultation or visit.

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#### **AUTHORS' CONTRIBUTION**

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

#### **CONFLICT OF INTEREST**

None declared.

#### **FUNDING**

None declared.

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