The Obstetrics Gynecology and Children's Hospital Emergency Room waiting time before hospitalization

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Abstract

Background: One of the most substantial factors affecting patient satisfaction in the Obstetrics–Gynecology and Children's Hospital is the wait time in the emergency room.

Objective: We retrospectively studied the waiting periods of patients visiting the emergency room patients in Bolu Izzet Baysal Obstetrics-Gynecology and Children's hospital.

Method: Using an automated documentation system for each patient that recorded the season in which the patients consulted the emergency room, the month, day, time, examination time, hospitalization decision time, the hospitalization clinic following the decision to hospitalize, and the time to hospitalization, we retrospectively studied the waiting periods of emergency room patients in Bolu Ýzzet Baysal Obstetrics–Gynecology and Children's Hospital.

Results: A total of 15,004 patients who consulted the hospital emergency room between November 24, 2009, and August 25, 2011, and who were hospitalized in a clinic were included in this study. The highest frequency of emergency room patient visits occurred during the summer season (28.1%), in the month of July (10.2%), on Mondays (16.1%), and between 8 and 11 AM (22.1%; $p < 0.05$). The emergency room wait time of patients consulting the pediatric clinic was (55 ± 67 min), which was significantly shorter than the wait time of patients consulting other clinics ($p < 0.05$).

Conclusion: The majority of patients who were hospitalized in any clinic through the emergency room consulted the hospital during the daytime hours. The time to hospitalization for the admitted patients was within an acceptable time frame. We believe that conducting comprehensive research to determine whether it is possible to reduce wait times even further to increase patient satisfaction will be instructive.

Key words: Emergency Room, acceptance-waiting time, emergency-waiting time, hospitalization-waiting time

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Introduction

Any environmental or biological condition threatening human life and health is included in the realm of emergency services[1]. Emergency rooms are defined as health units that are obliged to provide uninterrupted 24-h emergency health services to patients presenting with an urgent situation[2]. The efficiency of emergency rooms is becoming increasingly important and has been addressed by legislation.

Prompt emergency room service is expected when patients present to an emergency room with urgent health problems. However, depending on various factors, the wait times for access to health services can be lengthy, and these factors can prevent timely intervention for patients consulting emergency rooms. As a result, the probability of serious problems such as disability and death has increased[3, 4].

Bolu Province, which covers 1.015% of the area of Turkey (8,276 km²), is located in the western Black Sea region. The majority of studies regarding emergency room wait times have been performed in complex emergency departments. However, to the best of our knowledge, no publications have provided detailed information regarding emergency room wait times for patients hospitalized in obstetrics–gynecology and pediatrics hospital clinics. Our study determined the emergency room wait times for patients who were subsequently admitted to the Obstetrics–Gynecology and Children's Hospital in the Bolu Province.

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Methods

Data from patients who consulted the emergency room at the Bolu Izzet Baysal Obstetrics–Gynecology and Children's Hospital and who were hospitalized between November 24, 2009, and August 25, 2011, were used in this study. Those who consulted the emergency room but were treated and discharged without hospitalization and those who left the hospital without waiting for examination were excluded from this study. The hospital's automated system provided chronological information on each patient in this study, including the season in which the patients consulted the emergency room, the month, day, time, examination time, hospitalization decision time, the hospitalization clinic selected following the decision to hospitalize, and the hospitalization time.

The acceptance waiting time was defined as the time between patient registration and patient examination by an emergency room physician. The emergency examination time was defined as the time period between patient examination by an emergency room physician and the hospitalization decision. The hospitalization waiting time was defined as the time from the decision regarding hospitalization to the actual hospitalization in a clinic. The data were evaluated using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL), version 17.0 for Windows. One-way ANOVA, the post hoc Tukey test, the independent-sample *t*-test, and the chi-squared) test were used for statistical evaluation, and $p < 0.05$ was considered statistically significant

Results

A total of 15004 patients who consulted the hospital emergency room between November 24, 2009, and August 25, 2011, and who were subsequently hospitalized in a clinic were included in the study. Of these, 446 (2.9%) were pediatric surgery patients, 5672 (37.8%) were pediatric patients, and 8886 (59.2%) were obstetrics-gynecology patients.

The acceptance waiting time for patients consulting the emergency room in our hospital was 01minimum and 101maximum minutes, with a median value of 7 minutes. The emergency waiting time was 04 minimum and 390 maximum minutes, with a median value of 43 minutes. The hospitalization waiting time was 10 minumum 62 maximum minutes, with a median value of 10 min.

Compared with the other days of the week, Mondays had the largest number of emergency room patients who were later admitted to the hospital, with a total of 2416 cases (16.1%). The difference between patient density on Mondays and that on any other day was significant only for Sundays ($p < 0.05$; figure 1).

Saturdays had the highest number of pediatric emergency room patients, with a total of 1090 cases (19.2%). The number of patients admitted on Saturdays was significantly greater than that on Tuesdays, the day with the smallest number of patients ($p < 0.05$; figure 1).

The majority of patients who were hospitalized in the obstetrics–gynecology clinic consulted the emergency room on Mondays, with a total of 1567 (17.6%) cases. The number of cases

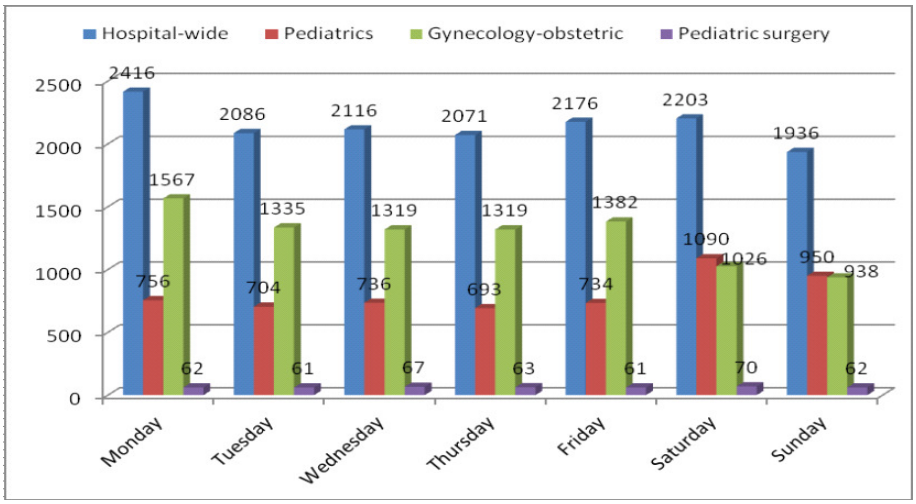

Figure 1: Patient distribution in pediatrics, pediatric surgery, obstetrics–gynecology, and the hospital in general according to days of the week

admitted on Mondays was significantly higher than the number hospitalized on Sundays, the day with the smallest number of patients ($p < 0.05$; figure 1).

The majority of patients who were hospitalized in the pediatric surgery clinic consulted the emergency room on Saturdays, with a total of 70 cases (15.7%; figure 1).

No significant difference according to day of the week was identified in acceptance waiting times, emergency waiting times, or hospitalization waiting times of patients consulting the emergency room in this study.

Emergency waiting times for patients consulting the obstetrics–gynecology emergency room were significantly shorter than those for patients consulting the pediatric emergency room ($p < 0.05$). No significant differences were identified among the other groups (table 1).

The number of patients who consulted the emergency room between 4 AM and 7 AM was significantly different from the number between 8 AM and 11 AM ($p < 0.05$; table 2).

Acceptance waiting times was identified between patients presenting during the 12–3 AM, 4–7 AM, and 4–7 PM time frames and those who applied during the 4–7 AM and 8–11 PM time frames ($p < 0.05$). When the hospitalization waiting times were considered, a significant difference was identified only between those applying to the emergency room in the 12–3 AM and 12–3 PM time frames ($p < 0.05$; table 2).

When the 8–11am time frame (the time period with the highest frequency of emergency room visits) was compared with the other time frames, no differences were identified in the acceptance waiting times and emergency waiting times. However, the hospitalization waiting time in the 8–11am time frame was significantly longer than those for all other time frames except 12–3pm ($p < 0.05$).

Although the emergency waiting times of patients consulting the obstetrics–gynecology emergency unit did not show a significant difference based on the application time, the acceptance waiting times and hospitalization waiting times were significantly different between 8–11am and 12–3am ($p < 0.05$).

With respect to seasons, 4214 cases (28%) visited the emergency room during the summer, 4127 cases (27.5%) during the spring, 3812 cases (25.4%) during the winter, and 2851 cases (19%) consulted the emergency room during the fall. A significant difference was identified when comparing the ratio of emergency room visits during the summer and fall seasons ($p < 0.05$; table 3).

Table 1: Distribution of the waiting periods in the emergency room depending on departments

Stand type	Service name	Median (minutes)	Min-Max (minutes)
Accept-standby	Pediatric surgery	8	3-613*
	Pediatrics	7	3-101*
	Gynecology-obstetric	7	1-101
	Total	7	1-101
Emergency-standby	Pediatric surgery	48	5-389[a]
	Pediatrics	46	5-389[a,b]
	Gynecology-obstetric	41	4-390[b]
	Total	43	4-389
Hospitalization-standby	Pediatric surgery	10	10-60[d]
	Pediatrics	10	10-62[d]
	Gynecology-obstetric	10	10-62
	Total	10	10-62

*a,b,c,d:Significant association found ($p<0.05$)

Table 2: Distribution of the patients in the pediatrics, pediatrics surgery, obstetric-gynecology and the hospital in general based on time frame

Stand type	Period	Pediatrics	Gynecology-Obstetric	Hospital-wide
		Median (minumum; maximum) minutes	Median (minumum; maximum) minutes	Median (minumum; maximum) minutes
Accept-standby	00-03 am	06(03;95)*	06(03;100)*	06(03;100)*,d
	04-07 am	07(03;99)*	07(03;95)*	07(03;99)*,x
	08-11 am	08(03;96)	07(03;101)	08(03;101)d
	12-15 pm	08(03;101)x	08(03;100)x	08(03;101)x
	16-19 pm	07(03;101)x	08(03;100)x	08(03;101)*
	20-23 pm	07(03;95)	07(03;99)	07(03;99)*
Emergency-standby	00-03 am	36(5;382)a	44(05;386)a	40(05;386)a
	04-07 am	43(05;389)	36(05;386)a	39(05;389)a
	08-11 am	58(05;384)a	43(04;387)a	47(04;387)a
	12-15 pm	45(05;374)b	44(05;372)	45(05;374)a
	16-19 pm	46(05;387)b	39(04;388)	41(04;389)a
	20-23 pm	42(05;389)	37(05;390)	40(05;390)
Hospitalization-standby	00-03 pm	10(10;58)c	10(10;62)b	10(10;62)c
	04-07 am	10(10;62)c	10(10;61)	10(10;62)
	08-11am	10(10;62)c	10(10;61)b	10(10;62)c
	12-15 pm	10(10;60)	10(10;60)c	10(10;61)c
	16-19 pm	10(10;62)	10(10;62)c	10(10;62)
	20-23 pm	10(10;61)	10(10;62)c	10(10;62)

*,x,a,b,c,d: Significant association found ($p<0.05$)

Table 3: Distribution of the waiting periods in the emergency room based on season

Stand type	Season	Median (minumum;maximum) minutes
Accept-standby	Winter	08(03;99)*
	Spring	08(03;101)*
	Summer	07(03;101)*
	Fall	08(03;101)
Emergency-standby	Winter	47(05;389)x
	Spring	40(05;390)x
	Summer	43(04;389)x
	Fall	42(05;382)
Hospitalization-standby	Winter	10(10;62)a
	Spring	10(10;62)a
	Summer	10(10;62)a
	Fall	10(10;62)

*,x,a:Significant association found ($p<0.05$)

The average acceptance waiting, emergency waiting, and hospitalization waiting times of patients consulting the emergency room according to season are shown in table 4. Acceptance waiting times during the spring season were significantly shorter than were those during the winter and summer seasons ($p < 0.05$). Furthermore, the emergency waiting times during the spring season were significantly shorter than the acceptance waiting times during the winter and summer seasons ($p < 0.05$). The number of patients consulting the emergency room by month were identified between July and November, which were the busiest and slowest months, respectively ($p < 0.05$; table 4).

No significant difference in emergency waiting times and hospitalization waiting times was identified according to month. However, the acceptance waiting times during April and November were significantly different from those during June and September ($p < 0.05$).

Table 4: Distribution of the waiting periods in the emergency room based on months

Months	Accept-standby time	Emergency-standby time	Hospitalization-standby time
	Median (minumum;maximum) minutes	Median (minumum;maximum) minutes	Median (minumum;maximum) minutes
January	08(03;93)	45(04;381)*	10(10;62)
February	07(03;95)	45(05;387)*	10(10;62)
March	07(03;101)	37(05;387)*	10(10;62)
April	08(03;95)*,b	42(05;390)*	10(10;61)
May	08(03;84)	43(05;389)*	10(10;62)
June	07(03;101)*,a	37(05;383)*	10(10;62)*
July	07(03;97)	50(05;389)*	10(10;61)
August	07(03;96)	44(05;386)*	10(10;62)
September	07(03;100)b,c	40(05;382)	10(10;62)
October	08(03;99)	44(05;373)	10(10;62)
November	09(03;101)a,c	47(05;379)	10(10;61)
December	07(03;99)	54(04;389)	10(10;61)

*,a,b,c:Significant association found (p<0.05)

Discussion

Patients frequently visit emergency rooms without specific diagnoses. Patients with life-threatening conditions consult emergency rooms in Turkey and throughout the world; however it is difficult to prevent emergency room congestion and overcrowding because patients who do not require emergency care also consult emergency rooms[5]. It is particularly important that emergency room acceptance waiting times not interfere with the identification of life-threatening conditions and emergency intervention in critical patients; we believe that the most effective solution for this condition is an effective triage system.

Extreme patient density in hospital emergency rooms was first reported 20 years ago[2]. In recent years, long emergency room wait times and delay in commencement of treatment due to this waiting time are recognized as important problems in many countries[2]. The health system that has been modified and developed over the last 10 years in our country has improved patient access to health services. However, throughout Turkey, this improvement has resulted in patient accumulation and congestion in hospitals that was previously experienced only in emergency rooms of certain hospitals.

Emergency room congestion has increased over time and is dependent on the characteristics of the patients and seriousness of their conditions. Emergency room waiting and acceptance times have increased accordingly. Emergency rooms are not capable of controlling these characteristics, as they mainly reflect the social and economic characteristics of the environment in which hospitals are located. Wait times may be extended depending on whether the emergency room is the initial consultancy point,

on the number of emergency room employees, on the physical status of the emergency room, and on the nature of the laboratory tests[6, 7].

Extended emergency room wait times result in a longer duration of pain experienced by patients, negative health effects, and reduced patient satisfaction[8, 9]. Moreover, because of increased wait times, growing numbers of patients leave the emergency room without receiving medical care[10]. The recommended acceptable emergency room wait time for patients to gain access to an emergency room physician is 15 min[11]. However, the average wait time in US emergency departments was 38 min in 1997, and that time grew to 47.4 min in 2004[12, 13]. According to various publications, the average emergency department wait times vary from 57 min [14] to 92.5 min[15]. In a study conducted by Genç *et al.*[16] in Turkey, the emergency room acceptance waiting time was 2.6 ± 0.1 min (median, 2 min), and the emergency waiting time was 77.3 ± 3.6 min (median, 60 min). In our study, the acceptance waiting time of patients consulting the emergency room was 11 ± 13 min, with a median of 7 min. Although the recommended acceptable emergency waiting time is 15 min[11], Banerjea *et al.* [15] found delays of 377 ± 261.3 min. The emergency waiting time in our study was 62 ± 64 min, with a median value of 43 min. The difference between the two results is related to the fact that no trauma patients consulted our hospital, which is an important factor in extending wait times.

The hospitalization waiting time in our hospital was 14 ± 9 min, with a median value of 10 min. These values may vary depending on a hospital's settlement plan, distance between units and the emergency room, the condition of the patient, patient density of the emergency room at a given time, and the status of the employees. Our data seem reasonable when considering these criteria related to our hospital and the time period required for preparing the patient's file for patient transfer after a making a hospitalization decision.

Parental decisions play a role regarding clinical and medical care received by children[17], and this decision-making procedure also affects emergency room wait times. Bourgeois *et al.* [18] reported that the pediatric emergency room patients' acceptance waiting time was 56.9 min, and the emergency waiting time was 168.5 min. Banerjea *et al.* [15] determined that the median length of pediatric emergency room patients' acceptance waiting time was 5 min, and the median value of the emergency waiting time was 119 min. In our study, the acceptance waiting time in the pediatrics department was 7 ± 13 min, and the emergency waiting time was 55 ± 88 min.

Banerjea *et al.* [15] determined that the median acceptance waiting time for patients consulting the obstetrics–gynecology emergency room was 79, min and the median emergency waiting time was 82 min. In our study, the acceptance waiting time in the obstetrics–gynecology department was 7 ± 12 min, and the emergency waiting time was 54 ± 91 min.

The short waiting times observed in our study reflect the fact that trauma patients are not accepted to our hospital. The emergency waiting time for patients consulting the obstetrics–gynecology emergency room was significantly shorter than that for the patients in the pediatric emergency room in our study. This result may be due to the fact that our hospital is not an obstetrics and gynecology hospital, and the patients consulting the hospital for birth were able to gain rapid access to a physician.

Whereas some reports have indicated that a greater number of patients consult emergency rooms during the weekend[19], other studies have detected no difference between the numbers of patients consulting emergency rooms during the weekend and that during the week[20]. In our study, the density of patients consulting the emergency room during the weekend was significantly different from that and during the week. Specifically, we showed that the density of patients consulting the pediatric emergency room was higher during the weekend, whereas the density of emergency room patients consulting the obstetrics and gynecology clinic was higher during the week. The number of the patients consulting the emergency room and the pediatric surgery clinic did not differ by days of the week.

With regard to the time frame of patient consultation to the emergency room, Booth *et al.* [14] indicated that 28.6% of patients visited the emergency room between 5 and 9pm, and 27.7% visited between 9am and 1am. In our study, we showed that 22.1% of patients visited the emergency room between 8 and 11am, and 21% visited between 4 and 7pm. We believe the increased congestion in our hospital during the daytime hours is due to the shortage of physician specialists in our hospital; therefore, patients consult the emergency room for examinations. Xie *et al.* [21] and Guttmann *et al.* [22] indicated that patient congestion increased in the emergency rooms in the order 8am –4pm > 4pm – 12pm > 12am–8am. These findings are congruent with those from our study. In contrast, Bourgeois *et*

al. [18] indicated that 50.5% of patients consulted the emergency room between 4pm and 12pm. Booth *et al.* [14] indicated that the average emergency waiting times were 53 min between 5pm and 9pm (the busiest time at the emergency service) and 56 min between 9am and 1pm. In our study, the emergency room waiting time was 64 ± 63 min between 8am and 11 am and 62 ± 66 min between 4pm and 7pm.

No difference was identified in the acceptance waiting times and emergency waiting times when the 8–1am time frame (the busiest time for patient applications to the hospital) was compared with other time frames. When compared with all other time frames excluding 12–3pm, the hospitalization waiting time in the 8–11am time frame was significantly longer than that at any other time. We believe that this problem was caused by the congestion encountered in all departments in the hospital during the 8–11am time frame, which slowed down the automation system in the hospital. Additionally, there may have been an insufficient number of employees in the hospital.

As expected, the waiting times increased with increasing numbers of patients in the emergency room, and the waiting times decreased with decreasing numbers of patients consulting the emergency room[23]. The waiting times increased in our emergency room between 8am and 11am when the density of the patients increased. The emergency room waiting times for patients admitted to the pediatric clinic were longer between 8 am and 11am than during all other time frames, and the acceptance waiting times and emergency waiting times were significantly longer between 12 and 3am. The emergency room acceptance waiting times and the hospitalization waiting times were significantly longer in the obstetrics and gynecology patients in the 8–11am and 12–3am time frames compared with the other time frames.

In Turkey, the numbers of patients who consult the emergency rooms are lowest during the spring and greatest during the summer, and the average number of patients differs depending on season[19.] Accordingly, Atherton *et al.* [24] and Glass *et al.* [25] indicated that the total number of emergency room patients increased during the summer season. Our study confirmed that the most applications were made during the summer and spring seasons. In contrast, Ye *et al.* [26] indicated that the number of emergency room patients was greatest during the winter season. In contrast to the study conducted by Emet *et al.* [19] , we found that spring was the second most crowded season. This result might be due to increased allergic reactions in children during this season. The acceptance waiting period was significantly shorter during the summer (the busiest season) than during the winter season. This result might be related to the fact that a decreased number of extremely sick patients consulted the emergency room during the summer season.

Song *et al.* [27] noted that the number of patients consulting emergency rooms increased from May to March. Battal *et al.* [28] indicated that the period between November and February was the busiest time. Emet *et al.* [19] identified the busiest month as July and the slowest month as March. In our study, we observed that the congestion, which began to increase in January, reached its maximum in July. We also found that November was the slowest month in the emergency room. In contrast, other studies have indicated that the emergency rooms are busiest from August to January [21]. Interestingly, we found that the acceptance waiting time during April to November was significantly longer than that during the period from June and September ($p < 0.05$).

Conclusion

The median value of the acceptance waiting times for patients consulting our emergency room was 7 min, the median emergency waiting time was 43 min, and the median hospitalization waiting time was 10 min; these wait times are acceptable. The highest frequency of emergency room patient visits occurred during the summer season, in the month of July, on Mondays, and during the 8–11am time frame. The slowest times were observed in the fall, in the month of October, and during the 4–7pm time frame. We demonstrated that the acceptance waiting times, emergency waiting times, and the hospitalization waiting times were significantly longer during the periods with increased numbers of patients.

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