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Assessment of Out-of-Hospital Deliveries Admitted to 112 Emergency Healthcare Ambulance Services

112 Acil Sağlık Hizmetleri Birimine Başvuran Hastane Dışı Doğumların Değerlendirilmesi

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Abstract

This study aims to assess the pregnant admitted to 112 Emergency Healthcare Services (EHS) for out-of-hospital deliveries. With this study, it is expected to contribute to the planning of EHS for pregnant woman admitted to 112 EHS and to the measurements to be taken to decrease the need for emergency admissions. All pregnant women (n=205) who were admitted to Ankara 112 Emergency Healthcare Ambulance Services due to out-of-hospital delivery between 2017 and 2019 were included in the study. The data of the pregnant women on place of delivery, total number of deliveries in the past, year of delivery, district of admission, nationality, and status of follow-ups in family physician were obtained from available records in the EHS through file scanning. Median age of mothers who were included in the study due to out-of-hospital delivery was 25 (minimum-maximum:16-44) years. Of all pregnant women, 79.5% (n=163) gave birth in their house and 15.6% (n=32) in the ambulance. Of the pregnant women who underwent out-of-hospital delivery in our study, most frequently 30.2% (n=62) gave birth to their second child and 18.5% (n=38) to their third child. Of the pregnant women, 72.7% (n=149) applied from a central district of the capital, and 27.3% (n=56) from a peripheral district. Whether the pregnant women had made their pregnancy follow-up visits in primary healthcare services during their pregnancy was evaluated and it was found that 39 (19%) out of the pregnant who had never made their follow-up visits were foreign nationals, which accounted for 52.7% of foreign national pregnant women, 21 (10.2%) were Turkish citizens, which accounted for 16% of all Turkish pregnant women. There was a statistically significant relationship between nationality and pregnancy follow-ups ($p<0.001$). In our study, the majority of the mothers who underwent out-of-hospital delivery had given birth before, lived in a central district, and had not substantially made their pregnancy follow-up visits. The rate of foreign national mothers who made their pregnancy follow-up visits was lower. In terms of age, foreign national mothers who underwent out-of-hospital delivery were younger than Turkish mothers. Our study results reveal that immigrants have low application rates to health institutions in our country regarding pregnancy follow-up and birth with their low pregnancy follow-up rate and high numbers of out-of-hospital births compared to their population.

Keywords: Out-of-hospital delivery, Emergency healthcare, Pregnancy follow-up, Primary care, Immigrant health services.

Özet

Bu çalışmanın amacı hastane dışı doğum nedeniyle 112 Acil Sağlık Hizmetlerine başvuran gebelerin değerlendirilmesidir. Çalışmanın 112 acil sağlık hizmetlerine başvuran gebelere yönelik acil sağlık hizmetlerinin planlanmasına ve acil başvuru ihtiyaçlarının azaltılmasına yönelik alınacak tedbirlere katkı sunması beklenmektedir. Ankara 112 Acil Sağlık Hizmetleri Birimine 2017 ve 2019 tarihleri arasında hastane dışında doğum nedeniyle başvuran tüm gebeler (n=205) çalışmaya dahil edilmiştir. Acil Sağlık Hizmetleri Biriminde mevcut kayıtlardan dosya taraması yapılarak, gebelerin doğumu yaptığı yer (ortam), geçmişte yapmış olduğu toplam doğum sayısı, yaşı (doğum yılı), başvuru yaptığı ilçe, uyruğu ve aile hekimi kontrol durumu verileri elde edilmiştir. Hastane dışında doğum nedeniyle çalışmaya dahil olan annelerin yaş ortancası 25 (minimum-maksimum: 16-44) idi. Tüm gebelerin %79.5'i (n=163) evde, %15.6'sı (n=32) ambulansla doğum yapmıştı. Çalışmamızda hastane dışında doğum yapan gebelerin en sık %30.2'sinin (n=62) ikinci doğumu ve %18.5'inin (n=38) ise üçüncü doğumu olduğu tespit edildi. Gebelerin %72.7'si (n=149) başkent merkezindeki bir ilçeden, %27.3'ü (n=56) perifer ilçeden başvurmuştu. Kadınların gebelikleri döneminde birinci basamak sağlık hizmetlerindeki gebe takiplerine gidip gitmedikleri değerlendirildiğinde, hiç kontrole gitmeyen gebelerden 39 tanesi yabancı uyruklu olup (%19), bu sayı yabancı uyruklu gebelerin %52.7'sini oluşturmaktaydı, 21'i Türkiye Cumhuriyeti vatandaşı olup (%10.2), bu kişiler Türk vatandaşı olan gebelerin %16'sını oluşturuyordu. Uyruk ile birinci basamak gebelik takibi arasında istatistiksel olarak anlamlı bir ilişki vardı (p<0.001). Çalışmamızda, hastane dışında gerçekleşen doğumlarda annelerin büyük çoğunluğu daha önce doğum yapmıştı, merkez ilçede oturuyordu, gebelik izlemlerini büyük oranda yaptırmamıştı. Gebelik takibini yaptıran yabancı uyruklu annelerin oranı daha düşüktü. Yaş değerlendirildiğinde, hastane dışında doğum yapan yabancı uyruklu anneler, Türkiye Cumhuriyeti vatandaşı olan annelere göre daha gençti. Çalışma sonuçlarımız göçmenlerin düşük gebelik takibi oranına karşın, nüfuslarına oranla yüksek hastane dışı doğum sayıları ile gebelik izlemi ve doğum konusunda ülkemizdeki sağlık kuruluşlarına düşük başvuru oranlarına sahip olduklarını ortaya koymaktadır.

Anahtar Kelimeler: Hastane dışı doğum, Acil sağlık hizmetleri, Gebelik takibi, Birinci basamak sağlık hizmetleri, Göçmen sağlığı hizmetleri.

Introduction

Pregnancy is a physiological condition resulting in the birth process under normal conditions [1]. Every pregnant woman has the right to give a healthy and safe birth. One of the factors affecting morbidity and mortality of women in their reproductive age is the complications during pregnancy. It is estimated that approximately 2.6 million stillbirths and 287,000 (2020 estimates by World Health Organization; WHO) maternal deaths happen every year around the world [2,3]. Main epidemiologic sign of improvement in mother's health is the reduction of maternal mortality [4]. It has been revealed that out-of-hospital deliveries are associated with high perinatal morbidity and mortality rates [5]. Among the measurements regarding safer pregnancies, the WHO states the requirement for an active transport and transfer system to provide pregnant women access care at higher levels especially during emergencies [6]. This service is mostly

met within the scope of emergency healthcare services.

In Türkiye, different programs have been put into implementation by the Ministry of Health-General Directorate of Public Health-Department of Women's and Reproductive Health in order to promote maternal and child health together. Among these programs, the mother-Friendly Hospital program aims "to provide future mothers access safe and good-quality delivery services by increasing the quality and quantity of maternal healthcare services" and Emergency Obstetric Care Program aims "to take measures to provide all deliveries happen in maternal-, child- and family-friendly environments with educated healthcare personnel in healthcare institutions and to decrease the preventable maternal deaths" [7]. While the rate of deliveries in the hospital was 78% in 2003 it increased to 99% in 2018 [8]. The antenatal care coverage that was 81% in 2003 increased to 96.4% in 2018 (at least one visit) [8].

Regular pregnancy follow-ups in family health centers have great importance. Pregnancy follow-up in family health centers actually begins with consultancy service before pregnancy, goes on during pregnancy and continues as postpartum follow-up after delivery.

According to the results of the 2018 Türkiye Demographic and Health Survey (DHS), almost all (99%) of the deliveries were performed in a healthcare institution, in the public sector in particular (59%). Only 1% of deliveries happened at home and healthcare personnel accompanied 99% of deliveries [8].

This study aims to assess out-of-hospital deliveries admitted to 112 Emergency Healthcare Services. With this study, it is expected to contribute to the planning of emergency healthcare services for pregnant women admitted to 112 emergency healthcare services and to the measurements to be taken to decrease the need for emergency admissions. Moreover, factors affecting deliveries at home will be clarified. It is considered that the study will also contribute to the measurements to be taken for possible problems.

Material and Method

The study was conducted according to the guidelines of the Declaration of Helsinki. For the study, ethical approval was obtained from the Ethics Committee of Ankara Bilkent City Hospital (protocol code E1-20-335 and date of approval 12 September 2023) and research permission was obtained from the Department of Emergency Healthcare Services of Ankara Provincial Directorate of Health regarding performing the study in emergency health care institutions.

The study is cross-sectional research comprising a period that was retrospectively obtained from 112 Emergency Healthcare Ambulance Services' archive of patient records. All pregnant women (n=205) who were admitted to Ankara 112 Emergency Healthcare Ambulance Services due to out-of-hospital delivery between 2017 and 2019 were included in the study. The data of the pregnant women on place of delivery (environment), total number of deliveries in the past, year of delivery, district of admission, nationality, and status of follow-ups with family

physician were obtained from available records in the Emergency Healthcare Services through file scanning. The data were analyzed using IBM SPSS Statistics 21 (IBM Corp., Armonk, NY, USA) software program.

Whether 57 individuals among the participants made family physician follow-up visits during pregnancy or not and the birth ranking of out-of-hospital deliveries of 60 individuals could not be determined as there was no information about them in the records.

The data obtained revealed that the rate of foreign national women among the pregnant admitted to 112 Emergency Healthcare Ambulance Services was high compared to the population. Therefore, statistical comparisons were performed between Turkish citizens and foreign nationals and expressed in total.

The data were analyzed with IBM SPSS Statistics 21 software program. As the data were not normally distributed, they were expressed in median and interquartile range and descriptive statistics were expressed in percentiles. Pearson's chi-square test was used for comparison of categorical variables. Statistical significance was accepted as $p < 0.05$.

Results

A total of 205 pregnant women admitted to Ankara 112 Emergency Healthcare Ambulance Services due to out-of-hospital delivery between 2017 and 2019 were assessed. Out of these women, 131 (63.9%) were Turkish citizens and 74 (36.1%) were foreign nationals. The majority of foreign mothers were from Syria, Iraq, and Afghanistan.

Sociodemographic and statistical data of out-of-hospital deliveries were shown in [Table 1](#). Median age of mothers included in the study was 25 (IQR=9, min: 16, max: 44) years. Median age of Turkish mothers was 27 (IQR=9, min: 16, max: 44) years. There was a statistically significant difference between median ages of foreign national and Turkish mothers ($p < 0.001$). While more than half (64.9%) of foreign mothers were at the ages between 16 and 24, more than half (50.4%) of Turkish mothers were at the ages between 25 and 34.

Of all pregnant women, 163 (79.5%) gave birth in their house and 38 (18.5%) gave birth in the ambulance or in a vehicle. No statistically significant relationship was found between nationalities in terms of place of delivery and number of deliveries ($p=0.109$ and $p=0.543$ respectively).

When the ranks of out-of-hospital deliveries were assessed, it was found that 62 (30.2%) were second birth and there was no statistically significant difference between nationality and rank of delivery ($p=0.139$).

The number of admissions to 112 Emergency Healthcare Ambulance Services for out-of-hospital delivery was assessed and it was found that the number was lower ($n=41$; 20%) in 2019

compared to 2017 and 2018. The number of out-of-hospital deliveries was 79 in 2017, 85 in 2018 and 41 in 2019. Of all deliveries, 149 (72.7%) happened in central districts of Ankara.

Whether the pregnant made pregnancy follow-up visits in primary healthcare services during their pregnancy was assessed and according to the results, 39 (19%) of the pregnant women who had never made follow-up visits were foreign national, which accounted for 52.7% of foreign pregnant women and 21 (10.2%) were Turkish citizens, which accounted for 16% of all Turkish pregnant women. There was a statistically significant relationship between nationality and primary healthcare pregnancy follow-up visits ($p<0.001$).

Table 1. Sociodemographic distributions of the patients of out-of-hospital deliveries admitted to 112 Emergency Healthcare Services.

		Turkish		Foreign		Total		p*
		n	%	n	%	n	%	
Age	16-24	47	22.9	48	23.4	95	46.3	<0.001
	25-34	66	32.2	23	11.2	89	43.4	
	35 and above	18	8.8	3	1.5	21	10.2	
Place of delivery	Ambulance	19	9.3	13	6.3	32	15.6	0.109
	House	102	49.8	61	29.8	163	79.5	
	Vehicle	6	2.9	0	0.0	6	2.9	
	Outside	4	2.0	0	0.0	4	2.0	
Rank of delivery	1	7	3.4	11	5.4	18	8.8	0.139
	2	46	22.4	16	7.8	62	30.2	
	3	27	13.2	11	5.4	38	18.5	
	4	5	2.4	6	2.9	11	5.4	
	5	5	2.4	3	1.5	8	3.9	
	6	3	1.5	3	1.5	6	2.9	
	7	1	0.5	1	0.5	2	1.0	
	Unknown					60	29.3	
Year of delivery	2017	50	24.4	29	14.1	79	38.5	0.958
	2018	54	26.3	31	15.1	85	41.5	
	2019	27	13.2	14	6.8	41	20.0	
District of delivery	Central district	98	47.8	51	29.4	149	72.7	0.227
	Peripheral district	33	16.1	23	11.2	56	27.3	
Number of follow-ups in primary healthcare	No follow-up	21	10.2	39	19	60	29.3	<0.001
	1-3 times	18	8.8	5	2.4	23	11.2	
	4-6 times	50	24.4	6	2.9	56	27.3	
	7-8 times	8	3.9	1	0.5	9	4.4	
	Unknown					57	27.8	

*Pearson's chi-square test

Discussion

Pregnancy follow-up starts before pregnancy in family health centers. Pregnancy follow-ups are crucial for both maternal and child health. When mother and child have any problem during these follow-ups, they have a chance for early diagnosis and treatment. These follow-ups also contribute to the planning of delivery through getting information from the family about the place where the delivery will be performed. Regular continuity of pregnancy follow-ups is crucial for a healthy delivery.

Patients in our study gave birth out of the hospital. Median age of our patients was 25 years. In a study assessing out-of-hospital deliveries in Sweden, the ages of participants ranged from 21 to 36 and the median age of mothers was 29 years [9]. In another study from Norway, mean maternal age for unplanned out-of-hospital deliveries was 30.5 ± 5.1 years [10]. In a study in Brazil, the mean age of women who underwent out-of-hospital delivery was 25.43 ± 6.73 years [11]. In the study by Gutvirtz et al., the mean age of women who underwent out-of-hospital delivery was 28.4 ± 5.8 years [12]. Our study and other studies reveal that the ages of mothers who undergo out-of-hospital delivery are approximately between 25 and 30.

In our study, 79.5% of out-of-hospital deliveries happened at home, 15.6% in the ambulance, 2.9% in another vehicle, and 2% in an out-of-hospital or out-of-home environment. In a study by Diana et al., most of the out-of-hospital deliveries (53%) happened in the house of mother and a lower part (19.7%) happened during transport (car/taxi/bus) to the hospital [11]. In another study, 40.9% happened at home as unplanned, 46.0% during transportation and 13.1% in non-determined places [10]. When our study and other studies are evaluated, it is observed that unplanned deliveries mostly happen at home or second most commonly on the way to the center in which the delivery will be performed, which may be due to mothers' lack of knowledge about labor pains and birth process, not receiving sufficient antenatal care, not planning the place of delivery, and problems regarding transportation [13]. We here confront

the necessity and importance of informing mothers and their relatives about the birth process, especially the frequency of labor pains and when to go to a healthcare center. The importance of informing patients and their relatives about the fact that the birth process can progress faster for mothers who have given birth to one or more becomes evident.

While there is no information about the rank of delivery of approximately one third of patients in our study 30.2% of all pregnant women gave birth to their second child, 18.5% to third child and 8.8% to first child. Only 8.8% of first deliveries were out of hospital and women who underwent out-of-hospital delivery were mostly multiparous, which may be associated with the inability of these patients to manage the related process. A study performed on unplanned out-of-hospital deliveries found that giving birth to more than one child was a risk factor for out-of-hospital deliveries [10]. In a study performed in Sweden, all of the women who underwent out-of-hospital delivery had given birth under normal conditions before [9]. In a study performed in Brazil, the mean number of pregnancies was 3.48 ± 2.03 in women who underwent out-of-hospital delivery [11]. In another study, multiparity was found as a risk factor for out-of-hospital delivery [14]. In a study by Kulhan et al., the majority of mothers who gave birth in the house were multiparous and the mean number of their deliveries was 2 ± 1.08 [15]. In the study by Gutvirtz et al., 95.9% of women who underwent out-of-hospital delivery were multiparous [12]. In our study and other studies in literature, women who underwent out-of-hospital delivery had given birth to one or more children before. This result can be associated with faster progress of delivery for mothers who have given birth before [16]. Mothers and their relatives should be informed about the birth process, mothers who have given birth before should be told that delivery progress can be faster, and they should be warned to take necessary precautions. It is crucial to plan deliveries during pregnancy for a better maternal and child health. Unplanned out-of-hospital deliveries create high risk for both maternal and child health.

In our study, while 72.7% of patients underwent out-of-hospital delivery in a central district, 27.3% were admitted from a peripheral district. According to the report of 2018 Türkiye DHS, 0.5% of deliveries performed at home happened in an urban area and 2.2% in a rural area [8]. In a study, being resident in a rural area was determined as a risk factor for out-of-hospital delivery and the possibility of out-of-hospital delivery for women living in peripheral districts was four times higher compared to women living in more central districts [10]. In a study performed in Finland, distance to the hospital was evaluated as a risk factor for out-of-hospital delivery. A distance of 35 km and above to the hospital increased the risk of out-of-hospital delivery [17]. Transportation lasting more than 45 minutes from patient's house to the healthcare center in which the delivery would be performed was assessed as a risk factor in a study [14]. Unplanned out-of-hospital deliveries were more common among women living in rural areas [12,18]. Distance to the nearest healthcare center and duration of transportation are evaluated as important factors for out-of-hospital delivery in literature. In our study, patients who underwent out-of-hospital delivery mostly lived in central districts, which may be associated with the following conditions: our study was performed in the capital; it sometimes may take long time to reach the nearest healthcare center in a metropolis due to traffic; the admissions happen through the end of birth process due to the comfort of being accessible; or the population is higher in central districts compared to peripheral districts.

In our study, there was a statistically significant difference between median ages of foreign and Turkish mothers who underwent out-of-hospital delivery ($p < 0.001$). It was observed that foreign national patients got pregnant at younger ages. More than half of foreign mothers were between the ages of 16 and 24 and more than half of Turkish mothers were between the ages of 25 and 34. According to the report of 2018 Türkiye DHS, median first marriage age was 21.4 years and median maternal age during the first delivery was 23.3 years in Türkiye [8]. According to the Syrian Migrant Sample report of 2018

Türkiye DHS, median marriage age among Syrian migrant women was 19.3 years, median maternal age during first delivery was 21.4 years for Syrian women and 39% of Syrian migrant women in adolescence had a child or were pregnant for their first child [19]. In a study performed by Baş et al. in Edirne, the median marriage age of migrant women was 18.6 and their first pregnancy age was 19.2 [20]. The results were similar in our study, which can be explained with that mothers undergoing out-of-hospital delivery were more multiparous and that median age in our study was a little higher compared to the general population. Marriage and first pregnancy age of foreign national women was younger, which may be resulted from local, familial, and cultural differences. In addition, conditions such as baby boom in migrant societies can be another factor [21].

In our study, there was a statistically significant difference between nationality and pregnancy follow-up in the primary healthcare system ($p < 0.001$). More than half of foreign patients and about one fifth of Turkish patients had never made pregnancy follow-up visits in primary healthcare service. The number of Turkish patients who made pregnancy follow-up visits was higher. According to the report of 2018 Türkiye DHS, 96.4% of Turkish mothers had received antenatal care [8]. According to the Syrian Migrant Sample report of 2018 Türkiye DHS, 92.9% of Syrian migrant women living in Türkiye had received antenatal care from health personnel (physician, nurse, or midwife). Of Syrian migrant women, 74% had received antenatal care first trimester and 64% had received antenatal care four or more times [19]. According to these data, while it was observed that delivery of healthcare service regardless of nationality was at quite high rates in Türkiye hosting the highest number of migrants in the world, Turkish mothers had applied for antenatal care more often compared to the Syrian migrant mothers. As it is obvious that Syrian migrant mothers living in Türkiye received antenatal care at high rates [19], it is possible to say that migrant healthcare services have successfully been carried out [22]. Since women who underwent out-of-hospital delivery were included

in our study it was observed that those women had not received sufficient antenatal care. In our study, foreign national mothers who underwent out-of-hospital delivery had received less antenatal care. Islam and Gangnon detected in their study that migrant women had the states of receiving antenatal care, giving birth in hospitals, and benefiting from postpartum care and reproductive healthcare services less [23]. This may be resulted from foreign national patients' language-related problems, being out of the healthcare system, socioeconomic conditions, fear of stigmatization, transportation problems, and lack of social support.

According to our study, about half of mothers who underwent out-of-hospital delivery had not made their pregnancy follow-up visits. International literature indicates that in developed countries, one of the predominant factors associated with unplanned births before arrival at hospital is lack of prenatal care [24]. In a study in Brazil, women who underwent out-of-hospital delivery had not received proper antenatal care and only one third of mothers had made six or more pregnancy follow-up visits [11]. In another study, absent or poor antenatal care was assessed as a risk factor for out-of-hospital deliveries [14]. According to the study by Lazic and Takac, approximately 30% of women who gave unplanned home birth had received insufficient antenatal care and one third of women had not made their pregnancy follow-up visits [25]. In the study by Gutvirtz et al., 26.2% of mothers who underwent out-of-hospital delivery had received insufficient prenatal care [12]. It was found in the study by Khupakonke et al. that 16.7% of women who underwent out-of-hospital delivery and 2.7% of women who gave birth in the hospital had not visited a healthcare center for antenatal care [26]. In the study of Tüzmen et al., the state of not getting antenatal care was assessed as a risk factor for unplanned home births [27]. When our study and literature are evaluated, it is concluded

that mothers who undergo unplanned out-of-hospital delivery have not received sufficient antenatal care. It is possible to say that unplanned out-of-hospital deliveries are associated with insufficient amount of antenatal care and not regularly making pregnant follow-up visits can be evaluated as a risk factor for unplanned out-of-hospital deliveries.

As our study was retrospectively performed only the recorded archive data were involved; therefore, non-recorded data may be missing, which is the limitation of our study.

Conclusion

In our study, the majority of mothers who underwent out-of-hospital delivery had given birth before, lived in a central district, and had not substantially made their pregnancy follow-up visits. Foreign national mothers had made fewer pregnancy follow-up visits. When the ages were compared, it was concluded that foreign national mothers who underwent out-of-hospital delivery were younger than Turkish mothers.

It is crucial to make pregnancy follow-up visits regularly for a healthy delivery. Pregnancy follow-ups are provided for individuals from all nations for free in family health centers in Türkiye. The pregnant women undergo physical examination during these follow-ups with their medical history. They are assessed in each follow-up, the aim of which is to determine risky conditions in an early period. During the last trimester pregnancy follow-up, the pregnant women are asked whether they have any plan for the place of delivery and they are supported in terms of planning where the delivery takes place.

Informing future mothers about pregnancy follow-ups and supporting them to get antenatal care seem crucial. Moreover, informing future mothers about the delivery process during pregnancy follow-ups will contribute to reduction of the rate of unplanned out-of-hospital deliveries and to protection of maternal and child health.

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