



Comparison of delivery characteristics and obstetric outcomes of Syrian refugee pregnancies after a decade

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Abstract

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Aim: This research aims to compare and analyze the demographic, obstetric, and neonatal outcomes of Syrian refugees (SYR) and Turkish pregnant women.

Materials and Methods: This retrospective cross-sectional study included 1,823 pregnant Turkish and Syrian women aged 13 to 47 who gave birth at a tertiary care facility in the Mediterranean region of Turkey. Between September 2020 and August 2021, 940 Turkish and 883 SYR pregnant women participated in the study. The groups were compared for demographic data, obstetric outcomes, and neonatal features.

Results: The maternal age distribution for SYR includes younger ages ($p < 0.001$). The literacy status among Syrians is lower than that of Turks ($p < 0.001$). Syrian pregnant women have a lower prevalence of cesarean section (CS); they have a greater rate of first spontaneous vaginal delivery (fSVD) and spontaneous vaginal delivery (SVD) than Turkish pregnant women ($p < 0.001$). Amniotic membrane rupture is more prevalent among pregnant Syrian women ($p = 0.007$). APGAR scores differ by nationality ($p = 0.004$). There is a significant difference in maternal hemoglobin median values (g/dL) according to nationality ($p < 0.001$). There is a substantial difference between the birth weights of newborns with low birth weight (LBW) ($1500 \leq - < 2500$ grams) and those with 2500 grams or more in both groups ($p < 0.001$).

Conclusion: Antenatal care is the most valuable and effective method for adverse pregnancy and neonatal outcomes. There is a strong relationship between education and prenatal care utilization. As women's education levels increase, the rates of prenatal care also increase, and adolescent pregnancy rates and adverse neonatal outcomes decrease.



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Introduction

As a result of the internal conflicts in the Syrian Arab Republic in 2011, millions of Syrians had to flee to neighboring countries. As of September 2020, 6.7 million civilians migrated to Turkey, Lebanon, and Jordan for safe living conditions [1]. Due to this migration, Turkey has experienced unprecedented human mobility in the last eleven years. When the first group of SYR came to Turkey in 2011, it was not expected that millions would follow them and that the crisis would last this long. Eleven years have passed since the start of the Syrian migration to Turkey, and since then, the Syrian refugee (SYR) population has exceeded 3.6 million [2]. According to data, the number of Syrians born in Turkey after the Syrian migration between 2011 and 2019 has exceeded 450 thousand [2]. In 2019, the annual number of Syrian refugee births increased

to 170,000. These circumstances exacerbate the importance of maternal health and access to health services [2]. Pregnant Syrian women living in dire circumstances and with low incomes face a greater risk of adverse pregnancy outcomes [3]. From this viewpoint, when we examined the data from different sources identified in the literature in the last decade, we found that SYR are at risk for adverse obstetric outcomes, including preterm birth, PROM, LBW, and maternal anemia [4]. Our current study aims to compare the obstetric and neonatal outcomes of SYR and pregnant Turkish women and to examine what should be done to reduce adverse obstetric and neonatal outcomes.

Materials and Methods

This study was conducted on the Helsinki Declaration's ethical principles. It was allowed by the Ethics Committee of the Health Sciences University Adana City Training and Research Hospital on May 30, 2022, with decision number 1960. The application to the Ministry of Health Scientific Research Platform for the current

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research has been reviewed and evaluated as appropriate (Form Name: Sadık Kükreer-2021-07-08T21_48_13). Consent forms translated into Turkish and Arabic were obtained from all pregnant women included in the study.. The doctor has a unique password to access the archives of the central electronic data processing system to retrieve all patient medical records.

At the point of selection of the variables in the study, only pregnant women who gave birth during the working period in the delivery room service of a single physician for one year were evaluated. Thus, the relativity of the indication of a different physician in determining the mode of delivery of the pregnant women included in the study was excluded. As a result of this criterion, 1,923 Turkish and Syrian pregnant women between the ages of 13–47 were included in the planned retrospective cross-sectional study. One hundred pregnant women from Syria and Turkey could not participate in the research because they did not meet the requirements to join. Among the instances considered in the study, 85 pregnant women were removed because their files lacked sufficient information. The remaining 15 cases were removed from the study because they were pregnant women who voluntarily left the hospital before giving birth. This study included 940 Turkish and 883 SYR pregnant women between September 2020 and August 2021. We conducted this research at the HSU Adana City Training and Research Hospital, a tertiary center in the Mediterranean region of Turkey (Figure 1).

Turkish and Syrian pregnant women under 24 weeks of gestation and patients whose obstetric and laboratory results could not be obtained in the electronic data system were excluded from the study. Variables were excluded from the analysis, such as gestational diabetes mellitus and chronic systemic disorders, due to the SYR population's inadequate prenatal care. In our study, for the determination of the gestational week, the last menstrual period of the patients and the crown-rump length (CRL) values in the ultrasonographic measurements taken in the first trimester were determined [5, 6]. Multiple pregnancies in the study included Syrian and Turkish twin pregnant women with dichorionic diamniotic chorionicity. Inter-membrane thickness and lambda sign (λ), one of the sonographic criteria, between 10 and 14 weeks of gestation, were considered for chorionicity determination. PROM refers to the rup-

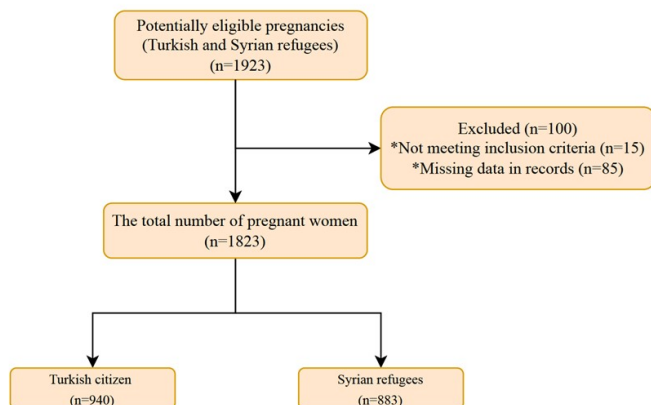


Figure 1. Flow diagram of participants.

ture of fetal amniotic membranes before labor starts at 37 weeks and later in term pregnancies and before 37 weeks in preterm pregnancies [7]. ACOG published [8] that IUGR (intrauterine fetal growth restriction) was a condition in which a fetus's estimated weight was less than the 10% percentile for the number of weeks of pregnancy. In the practice bulletin published by ACOG [9], blood pressure of at least 140/90 mm Hg, measured twice at 4-hour intervals, is the criteria sought to diagnose preeclamptic pregnancy in patients over the 20th gestational week. The 5th-minute APGAR score was preferred in our study because it better determined newborns' mortality and cerebral palsy risks [10].

Statistical analysis

The data was analyzed using IBM SPSS V23. For this purpose, Pearson chi-square and Yates's correction tests for continuity analyzed categorical data by nationality in adolescent and adult pregnancies. The Kolmogorov-Smirnov test was used to determine the normal distribution of quantitative data, and the Mann-Whitney U test was used to evaluate group comparisons. Mean \pm SD (standard deviation) and median (minimum-maximum) were used for quantitative data, while frequency (percentage) was used for categorical data. The level of significance was set at $p < 0.05$.

The sample width was calculated using the G*Power V. 3.1.9.6 program. Considering the maternal age values and assuming that the data are normally distributed according to 95% confidence ($1-\alpha$), 95% test power ($1-\beta$), and $d=2,822$ effect size, a total of 150 samples should be included in the study [11]. Assuming that the data are not normally distributed, a total of 158 samples should be included in the study.

Results

In our study, the age of the Syrian mother candidates was found to be young, and their education level was found to be significantly lower than the Turkish mother candidates ($p < 0.001$) (Table 1).

It is seen that the method of birth differs according to nationality ($p < 0.001$). While Syrian pregnant women have a lower prevalence of CS, they have a greater rate of first SVD and SVD than Turkish pregnant women (Table 2).

The rupture of the amniotic membrane differs according to nationality ($p=0.007$). Amniotic membrane rupture is more prevalent among pregnant Syrian women. Cervical dilatation rate of Syrian immigrants at the time of application was higher than that of Turkish expectant mothers ($p < 0.001$). The distribution of length of stay in the hospital showed statistically significant differences according to nationalities ($p < 0.001$). The hospital stay was two days for pregnant women of both nationalities. However, the difference is due to the average ranking. While the average ranking of Turkish pregnant women was 980.37, the average ranking of Syrian women was 839.21. It was determined that the median values of maternal hemoglobin (g/dL) were lower in SYR ($p < 0.001$). While the median value was 11.6 for expectant Turkish mothers, the median value was 10.5 for Syrian pregnant women. Likewise, the

Table 1. Comparison of variables by nationality.

	Turkish citizen	Syrian refugee (SYR)	p
Maternal age			
≤15	3 (0.3) ^a	14 (1.6) ^b	<0.001 ^a
16–19	305 (32.4) ^a	516 (58.4) ^b	
20–34	533 (56.7) ^a	296 (33.5) ^b	
≥35	99 (10.5) ^a	57 (6.5) ^b	
Level of education			
Illiterate	21 (2.2) ^a	189 (21.4) ^b	<0.001 ^a
Primary education	564 (60) ^a	609 (69) ^b	
Secondary education	303 (32.2) ^a	85 (9.6) ^b	
High education	52 (5.5) ^a	0 (0) ^b	
Number of pregnancies			
1	407 (43.3)	421 (47.7)	0.290 ^a
2	281 (29.9)	244 (27.6)	
3	109 (11.6)	99 (11.2)	
4-8	143 (15.2)	119 (13.5)	
Number of births			
0	411 (43.7)	421 (47.7)	0.063 ^a
1	290 (30.9)	269 (30.5)	
2	125 (13.3)	84 (9.5)	
3-6	114 (12.1)	109 (12.3)	
Number of stillbirths			
0	916 (97.4)	868 (98.3)	0.272 ^a
1-4	24 (2.6)	15 (1.7)	
Number of abortions			
0	873 (92.9)	833 (94.3)	0.202 ^a
1-4	67 (7.1)	50 (5.7)	
Number of live births			
0	413 (43.9)	422 (47.8)	0.107 ^a
1	295 (31.4)	271 (30.7)	
2	128 (13.6)	86 (9.7)	
3	66 (7)	65 (7.4)	
4-6	38 (4)	39 (4.4)	

^aPearson Chi-square test; ^bYates correction, ^cMann-Whitney U test; a-b: There is no difference between the ratios of columns with the same letter in each row; notation: mean ± standard deviation, median (minimum-maximum) frequency (percent).

median maternal hematocrit values (%) were found to be significantly lower in Syrian pregnant women (p<0.001). While the median value was 34.0 for Turkish pregnant women, the median value was 31.6 for Syrian pregnant women. When the 5th-minute APGAR scores of Syrian and Turkish newborns were compared, it was determined that Syrian newborns had low APGAR scores (p=0.004) (Table 3).

When we compared the birth weights of newborns, it was seen that the birth weights of Syrian newborns LBW (1500 ≤ - <2500 grams) and 2500 grams and above were lower than the Turkish newborns (p<0.001). On the other hand, the median values of the height measurement (cm) of

Table 2. Comparison variables by type of delivery and cesarean section indications.

	Turkish citizen	Syrian refugee (SYR)	p
Type of Delivery			
Cesarean Delivery (CS)	475 (50.5) ^a	253 (28.7) ^b	<0.001 ^a
First vaginal birth f(SVD)	259 (27.6) ^a	336 (38.1) ^b	
Vaginal Birth (SVD)	206 (21.9) ^a	294 (33.3) ^b	
Cesarean section indications			
Abnormal Fetal Lie and Presentation	27 (5.7)	20 (7.9)	0.055 ^a
Acute Fetal Distress (AFD)	82 (17.3)	53 (20.9)	
Cephalopelvic disproportion (CPD)	47 (9.9)	31 (12.3)	
Fetal Macrosomia	20 (4.2)	11 (4.3)	
Intrauterine Growth Restriction	7 (1.5)	2 (0.8)	
Multiple pregnancies (twin pregnancy)	8 (1.7)	11 (4.3)	
Placenta previa	8 (1.7)	0 (0)	
Placental Abruption	5 (1.1)	5 (2)	
Preeclampsia	24 (5.1)	10 (4)	
Previous Caesarean Section	247 (52)	110 (43.5)	

^aPearson Chi-square test; ^bYates correction, ^cMann-Whitney U test; a-b: There is no difference between the ratios of columns with the same letter in each row; notation: mean ± standard deviation, median (minimum-maximum) frequency (percent).

Syrian newborns were found to be shorter than the Turkish newborns (p<0.001) (Table 4).

Discussion

This study aimed to examine the obstetric and neonatal outcomes of pregnant Turkish and Syrian mothers. According to the results of our study, SYR gave birth to more children between the ages of 14 and 19 than Turkish residents. Among pregnant women who gave birth, it was noted that Syrian mothers-to-be had a lower education level than Turkish mothers-to-be. In contrast to pregnant Turkish women, however, both first and subsequent births occurred spontaneously among pregnant Syrian women. The prevalence of maternal anemia, low birth weight, and neonates with low APGAR scores were also significantly higher among pregnant SYR. This study was undertaken in the Adana City Training and Research Hospital, which, with 12,000 births per year, has the highest birth rate in our region.

Since March 2011, the tragedy that Syrians have had to flee their nations to survive and seek security in neighboring countries has been going on for nearly ten years [2]. According to the data from 2018 [12], the average age of SYR living in Turkey is lower than that of the general population. While the average age of the Turkish population

Table 3. Comparison of variables according to maternal findings.

	Turkish citizen	Syrian refugee (SYR)	p
Rupture of amniotic membrane			
Negative	399 (42.4)	320 (36.2)	0.007 ^a
Positive	541 (57.6)	563 (63.8)	
Cervical dilatation (cm)			
<4	465 (49.5)	300 (34)	<0.001 ^a
≥4	475 (50.5)	583 (66)	
Cervical ripening (%)	60.8 ± 16.7 60.0 (20.0 – 100.0)	66.6 ± 17.9 70.0 (20.0 – 100.0)	<0.001 ^c
Maternal hemoglobin (g/dL)	11.5 ± 1.3 11.6 (6.6 – 15.5)	10.6 ± 1.1 10.5 (6.5 – 14.1)	<0.001 ^c
Maternal hematocrit (%)	33.8 ± 3.4 34.0 (20.6 – 42.9)	31.6 ± 2.8 31.6 (20.4 – 40.2)	<0.001 ^c
Length of stay in hospital / day	1.9 ± 0.7 2.0 (1.0 – 6.0)	1.7 ± 0.8 2.0 (1.0 – 6.0)	<0.001 ^c

^aPearson Chi-square test; ^bYates correction, ^cMann-Whitney U test; a-b: There is no difference between the ratios of columns with the same letter in each row; notation: mean ± standard deviation, median (minimum-maximum) frequency (percent).

Table 4. Comparison of variables according to neonatal outcomes.

	Turkish citizen	Syrian refugee (SYR)	p
Gestational week			
>41 weeks	5 (0.5)	2 (0.2)	0.150 ^a
37–41 weeks	775 (82.4)	704 (79.7)	
32–36 weeks	140 (14.9)	157 (17.8)	
28–31 weeks	16 (1.7)	11 (1.2)	
<28 weeks	4 (0.4)	9 (1)	
APGAR Score (5. minute)			
4–6	68 (7.2)	98 (11.1)	0.004 ^a
≥7	872 (92.8)	785 (88.9)	
Newborn weight (gram)			
≥2500 (g)	834 (88.7) ^a	685 (77.6) ^b	<0.001 ^a
LBW 1500 – 2499 (g)	93 (9.9) ^a	178 (20.2) ^b	
VLBW 1000 – 1499 (g)	9 (1) ^a	11 (1.2) ^a	
ELBW <1000 (g)	4 (0.4) ^a	9 (1) ^a	
Newborn height (cm)	49.6 ± 2.6 50.0 (35.0 – 54.0)	48.7 ± 3.0 50.0 (33.0 – 55.0)	<0.001 ^c

^aPearson Chi-square test; ^bYates correction, ^cMann-Whitney U test; a-b: There is no difference between the ratios of columns with the same letter in each row; notation: mean ± standard deviation, median (minimum-maximum) frequency (percent).

is 31.7, the age of the Syrian population is 22.54. When we examine the adolescent population rates (between the

ages of 15 and 24), we see adolescents make up 15.8% of the Turkish population and 22.55% of the Syrian population [2, 13]. While the general fertility rate of the Turkish population is 2.2%, the fertility rate in the Eastern Anatolia region has the highest rate at 3.2%. However, the total fertility rate among the Syrian refugee pregnant population reached 5.2%, and 93% of these births occurred in state hospitals [2]. The increasing rates of SYR on a population basis will lead to problems in health services. This demonstrates that countries hosting many SYR, particularly Turkey, must develop comprehensive social, economic, political, and security plans and measures [2]. In terms of the effects of demographic change due to refugee migration on maternal and newborn outcomes, confirmation of our research findings will have extensive suggestions for intervention to improve the perinatal health of immigrants.

Despite the equality of healthcare sources, reducing the differences in pregnancy results between refugees and local patients is challenging. Many factors, including maternal ethnic origin and socioeconomic situation, contribute to this inconsistency [14]. Antenatal care is an essential component of maternal and infant health, and it is recommended that every pregnant woman receive four prenatal examinations under the supervision of an obstetrician [15]. Additionally, in Turkey's public health centers, reproductive health counseling and birth control products are supplied free of charge. The Ministry of Health and the United Nations Population Fund (UNFPA) collaborate to produce and distribute Arabic-language booklets on safe motherhood, prenatal and postnatal care, good diet during pregnancy, and positive sex attitudes [16].

Foreign language is another barrier to healthcare access. Although Turkish authorities try to solve this problem by employing Syrian translators, there is still a shortage of Arabic-speaking translators in hospitals. As in education, they do not benefit from the follow-up programs carried out in primary health centers due to the frequent displacement habits of the Syrian refugee population within the boundaries of the country and the lack of a certain residence addresses [16].

Our current study shows that the rate of adolescent pregnant women aged 15–19 years is 32.7% in Turks and 60% in Syrians. In line with these rates, the prevalence of adolescent pregnancies among Turkish pregnant women is lower than that among Syrians. In their study, Vural et al. [11], reported that pregnant Syrian women were younger and had a shorter pregnancy period. They also emphasized that adolescent pregnancy is higher among SYR. Demirci et al. [17] reported that the average age of Turkish women is significantly older than that of Syrians ($p < 0.001$). Erenel et al. [14] showed that SYR pregnant women are considerably younger than Turkish pregnant women ($p < 0.001$). The same study [14] found that the percentage of adolescents between the ages of 12 and 19 years was significantly higher in SYR ($p < 0.001$). It has been stated in the literature that teenage fertility is 30% higher in conflict zones. Families see marriage as the greatest method to safeguard their daughters in a hostile world [11].

In our study, the education level of Syrian pregnant women was significantly lower than that of Turkish pregnant women. In the study of Ozel et al. [4], they state that 50% of Syrian refugee pregnant women are illiterate. In another study published by Demirci et al. [17] they reported that the percentage of illiterate Syrian refugee pregnant women (67.2%) was higher than the local population. According to the 2019 Syria Barometer survey, it was determined that 8% of Syrian households were illiterate, and 17% did not even finish primary school [2]. It is stated that the reason for this is that the refugee population immigrating to Turkey lives in the rural part of northern Syria and has been away from education opportunities for years. In the literature, it has been found that young girls with higher education levels who continue their academic education are less likely to become pregnant. School life not only prepares young people to work and earn a living but also raises their self-confidence and status in society. Education and training also delay child marriages and extramarital pregnancies, lead to healthy births [18].

In the present study, it was observed that the rate of CS among the birth types was higher in Turkish pregnant women, and the rate of fSVD and SVD was higher in SYR. No significant difference existed between the indications for CS in both groups. In the literature [19-21], unlike in our study, it was stated that CS rates are high in SYR. According to numerous studies conducted in our country, CS and primary CS rates are lower among SYR than pregnant Turkish women [4, 17, 22]. Demirbas et al. [23] discussed the rise in CS rates in Turks in their study. These include the increase in previous CS surgeries, not preferring SVD in breech presentations, malpractice law and high compensation rates, fear of SVD by expectant mothers, IVF pregnancies, and the increase in the number of pregnant women over the age of 35. According to Lefevre [24], some factors play a role in obstetricians' preference for CS. The most important of these is that doctors' defensive responses to the threat of medical malpractice prompt them to have more cesarean deliveries.

Our research showed that the admission cervical dilatation rate was substantially higher among SYR. A higher pain threshold or the inability to access a hospital could be a valid explanation for these findings [14]. We found that the cervical uterine dilatation of the pregnant Syrian women at the time of admission to the hospital was over 4 cm and the cervical ripening was over 70%. In the literature, it has been reported that early admission to a hospital with cervical dilatation of less than 4 cm is a risk factor for increased oxytocin induction administration and higher cesarean rates [14].

Our current study found that the premature membrane rupture rate was higher in Syrian pregnant women. Contrary to our research, Vural et al. [11] determined that the PROM rate was significantly lower in SYR ($p < 0.001$). In two studies conducted by Demirci et al., and Ozel et al. [4, 17], no significant difference was found in PROM rates ($p = 0.069$ and $p = 0.927$, respectively). In the scientific literature [25], a short cervix, copper and ascorbic acid deficiencies, low body mass index, low socioeconomic status, and smoking are among the primary risk factors for PROM. Nevertheless, a significant reason has not been

defined in patients who are typically PROM.

When the hemoglobin levels of Turkish and Syrian pregnant women were compared in our study, it was observed that pregnant SYR women were more anemic. Contrary to our study, Genc et al. [26] found Hb and Htc values in adolescent and adult pregnancies within the ranges recommended by WHO, and they did not observe a significant difference. On the other hand, Vural et al. [11] determined a high prevalence of anemia among pregnant SYR. They associated the reason for inadequate prenatal care, insufficient use of iron supplements, and inadequate follow-up during pregnancy due to foreign language barriers [11].

In our study, in which we compared Syrian refugee pregnant women and Turkish pregnant women, we found that Turkish women had more extended hospital stays in both groups. In their study [11], Vural et al. found that Turkish pregnant women stayed in the hospital longer than Syrian women. In our country, according to WHO standards, in the absence of postpartum complications, postpartum patients and newborns should stay in the hospital for at least 24 hours after SVD and 48 hours after a cesarean section [27]. We believe this difference in the length of hospital stay is due to the high prevalence of cesarean sections among pregnant Turkish women.

In our study, the prevalence of preterm birth in Turkish and Syrian pregnant women does not differ according to the weeks of gestation. Similar to our study, there is a similar picture between Turkish and Syrian refugee pregnant women in the study by Çelik et al. These outcomes can be attributed to the fact that Syrian refugee pregnant women receive adequate and accessible health services on a regional basis and are integrated into the social structure [28]. The study by Vural et al. [11] reported that the prevalence of preterm birth is higher among SYR women, and it is associated with low sociocultural levels, inadequate pre-pregnancy care, malnutrition, and post-traumatic stress disorder. In the study by Buyuktiryaki et al. [20], they published that only 7.3% of SYR have preterm births, compared to 15% of Turkish citizens. When the 5th-minute APGAR score rates were evaluated in our study, it was ascertained that Syrian infants had lower APGAR scores than their Turkish counterparts. Drukker et al. [29] propose maternal anemia is related to adverse neonatal outcomes, including a low APGAR score. In the study of Kiyak et al. [30], no difference was found in the APGAR score rates of newborns in both groups. Similar to our research, Vural et al. [11] found that the APGAR score of SYR infants was below 7.

Our study compared the newborns of pregnant Turkish and Syrian women and revealed that Syrian newborns had a lower birth weight than Turkish newborns. We found a significant difference in favor of Syrian pregnant women between 1500 g and 2500 g in LBW newborns between SYR and Turkish pregnant women. As a consequence of our literature review [4, 11, 17, 19, 20], we established that the risk of preterm delivery, EMR, and LBW increases for pregnant women in devastated environments and refugee camps who have inadequate access to food, a low level of education, and inadequate weight gain. Ongoing nutritional support programs, counseling, and early intervention to encourage healthy dietary choices during pregnancy

have been highlighted. Other studies [14, 22, 30, 31] in the literature show that refugee and non-refugee groups have similar rates of low birth weight. Kandasamy et al. [32] have documented internationally that refugee women are more likely to give birth to LBW infants.

Limitations

Future research will benefit from grouping the studies according to adolescent and adult pregnancies and evaluating the results according to their nationality. The absence of sufficient data on the outcomes of neonates with poor APGAR scores admitted to the neonatal intensive care unit is a drawback of our study.

Conclusion

The authors of this study believe that the high rates of teenage pregnancy and adverse obstetric and neonatal outcomes among Syrian immigrants can be reduced by raising the level of education and reducing the foreign language barrier. The registration and antenatal care processes in primary health care institutions should be enhanced, and refugees should be kept from frequently moving within the country. This emerging picture is a migration problem that is not only related to health but also includes socioeconomic and sociocultural reasons that are affected by numerous changes. To prevent high cesarean section rates in Turkish pregnant women, the criminal sanctions and malpractice laws that cause the increase in primary cesarean rates should be rearranged, and the government should provide financial and legal assurance to obstetricians against the complications they may encounter while performing their profession.

Abbreviations

SYR: Syrian refugees

CS: Cesarean section

fSVD: First spontaneous vaginal delivery

SVD: Spontaneous vaginal delivery

LBW: Low birth weight

PROM: Premature rupture of membranes

CRL: Crown-rump length

ACOG: American College of Obstetricians and Gynecologists

IUGR: Intrauterine fetal growth restriction

CRL: Crown-rump length

NICU: Neonatal intensive care unit

HSU: Health Sciences University

Ethics approval

It was allowed by the Ethics Committee of the Health Sciences University Adana City Training and Research Hospital on May 30, 2022, with decision number 1960.

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