Evaluation of Perinatal and Neonatal Outcomes of Syrian Refugees Compared to Turkish Population: A Snapshot During the COVID-19 Pandemic

Fatih Aktoz[1] · Can Tercan[1] · Eren Vurgun[2] · Busra Deniz Gelir[1] · Ibrahim Polat[1] · Burak Yucel[1]

Abstract

Background: The perinatal and neonatal outcomes of Syrian refugees during the coronavirus disease 2019 (COVID-19) pandemic are unknown. Therefore, in this study, we aimed to evaluate these outcomes. Methods: Turkish (n = 303) and Syrian refugees (n = 303) who delivered in our hospital between June 1, 2020 and December 31, 2020 were included in the study. Demographic, perinatal, and neonatal data were obtained by retrospectively evaluating hospital records. Results: Adolescent pregnancy was more common in Syrian refugees (p < 0.001). The rates of antenatal visits, performed combined test, triple test, quadruple test, fetal anatomy ultrasound, and glucose tolerance test were lower in all refugees (p < 0.01). Furthermore, there was no difference in the mode of delivery, Hb after delivery, gestational age, birth weight, Apgar score, stillbirth, and fetal anomaly (p > 0.05 for all). Conclusion: Despite poorer antenatal care during the COVID-19 pandemic, Syrian refugee pregnant women had similar perinatal and neonatal outcomes compared with the Turkish pregnant population.

Keywords Syrian refugee · Pregnancy · Obstetric outcome · Neonatal outcome · Perinatal outcome

✉ Fatih Aktoz
  fatihaktoz@gmail.com

  Can Tercan
  cntrcn89@gmail.com

  Eren Vurgun
  eren_vurgun@gmail.com

  Busra Deniz Gelir
  busradenizgelirr@gmail.com

  Ibrahim Polat
  dripolat@yahoo.com

  Burak Yucel
  drburakyucel@gmail.com

[1] Department of Obstetrics and Gynecology, Basaksehir Cam and Sakura City Hospital, Istanbul, Turkey

[2] Department of Medical Biochemistry, Prof. Dr. Cemil Tascioglu City Hospital, Istanbul, Turkey

Background

Since the civil war started in Syria in 2011, 6.6 million Syrians have left the country [1]. Of these, 65.7% of refugees immigrated to Turkey, and the total number of Syrians living in Turkey was 3,751,889 in March 2022 [2]. Half of these refugees are women, of whom 51.2% are in the reproductive period [3]. In addition, more than 600,000 Syrian babies were born in Turkey during this period [4]. In 2017, a population-based survey conducted in Sanliurfa, an important migration city in southeastern Turkey, showed that approximately 15% of Syrian migrant women were pregnant, a quarter did not receive antenatal care, and half had pregnancy loss [5]. Moreover, almost half of these women had at least one micronutrient deficiency. This study determined that adolescent pregnancy increased in the post-war period, and that this situation is directly related to the education level of refugees and time spent abroad as an immigrant. In contrast to all these problems, it was observed that Syrian refugee women wanted to have more children, possibly due to the psychological state of the war [5]. Therefore, besides the political and social problems in the region, the

biggest refugee crisis in recent years presents a very important projection of women's reproductive health.

Adapting to a new life is challenging for immigrants. At this stage, integration policies play an important role. From education to working life, necessary arrangements should be made for people to be part of the society of the host country [6]. The provision of health services is also a very important aspect of this adaptation process. Accordingly, the Turkish government has taken important steps, such as providing benefits to refugees through the public health system, building new health institutions close to places where refugees live, and employing translators for several health institutions. Our hospital, which is a fully equipped tertiary center and was built as one of the largest hospitals in the world, was put into service during the pandemic with the additional mission of integrating Syrian refugees into society with these steps as well as providing standard health services to the local population.

The birth of a healthy baby as a result of good antenatal and postnatal care is the ultimate obstetric outcome for both the patient and the physician. However, pregnancy is a difficult period for women because of the various risks it poses. These risks can only be minimized with good healthcare. Therefore, it is important for pregnant women to have easy access to health services. Unfortunately, for refugees, who are more vulnerable than the host population, the burdens of being in a foreign country are undeniable in this period. Studies have shown that pregnant Syrian refugees receive poor antenatal care and have adverse perinatal outcomes [7, 8]. However, the perinatal and neonatal outcomes of Syrian refugees during the coronavirus disease 2019 (COVID-19) pandemic are unknown. It is quite possible that the pandemic posed additional risks to this vulnerable group [9].

In this study, we aimed to evaluate the perinatal and neonatal outcomes of pregnant Syrian refugees who delivered in our hospital during the COVID-19 pandemic.

Methods

This cross-sectional study was conducted with Turkish and Syrian pregnant women who delivered in Basaksehir Cam and Sakura City Hospital, Istanbul, Turkey. For the study, a local ethics committee was established with the permission of the Ministry of Health of the Republic of Turkey, and approval was obtained (Approval number: 2021.04.80).

All Syrian refugee pregnant women who delivered in the hospital between June 1, 2020 and December 31, 2020 were included in the study. For randomization, the birth of a Turkish patient who chronologically followed the birth of each Syrian patient was included in the study.

Demographic information such as age; obstetrical history; presence of a systemic disease; ability to recall the last menstrual period (LMP); antenatal follow-up data, such as the total number of antenatal visits and screening test results; obstetric and neonatal outcomes, such as mode of delivery, gestational age, birth weight, Apgar score, presence of fetal anomaly, or stillbirth; and laboratory results, such as hemoglobin (Hb) levels before and 24 h after delivery and serology test results of the patients, were obtained retrospectively from hospital records.

Pregnancies at the maternal age of 19 and below were defined as adolescent pregnancy [10]. Gestational age was determined based on the date of the LMP. If a patient could not remember the date of their LMP, ultrasound measurement of the fetus in the first trimester was used for the estimation. The total number of antenatal visits was recoded into a categorical variable, according to the "at least four antenatal care visit" principle of the World Health Organization (WHO) [11]. Less than four antenatal visits were considered poor antenatal care.

Categorical variables were presented as frequency and percentage. A chi-square test was used to compare the categorical variables among the Turkish and Syrian refugee groups. Distributions of continuous variables were checked using the Kolmogorov–Smirnov test. All continuous variables were non-normally distributed. The Mann–Whitney U test was used to compare non-normally distributed parameters among the Turkish and Syrian refugee groups, and the results were given as the median (25th–75th percentile). Odds ratios and 95% confidence intervals (CIs) for less than four antenatal visits, cesarean section (CS) delivery, preterm delivery, and low birth weight were calculated using logistic regression models adjusted for potential confounders, such as age, parity, previous CS, and maternal systemic disease. All statistical analyses were performed using SPSS 17 (SPSS Inc., Chicago, Illinois, USA). A value of $p < 0.05$ was considered statistically significant.

The primary outcome of our study is the comparison of the number of antenatal visits (≥ 4) of the two groups. The power of the study was found to be 99.9%, with 303 samples for each group at a significance level (α) of 0.01.

Results

Between June 1, 2020 and December 31, 2020, there were 8,313 births in our hospital; 303 (3.6%) of these were the births of Syrian refugees. Accordingly, 303 Turkish patients were included in the control group.

The clinical characteristics of the study population are shown in Table 1. The median maternal age of Syrian refugees [23 (20–28)] was lower than that of Turkish pregnant

Table 1 Clinical characteristics of the patients

	Turkish (n = 303)	Syrian refugee (n = 303)	p value
Age (years)[a]	27 (24–31)	23 (20–28)	**< 0.001**
Adolescent pregnancy[b]	13 (4.3%)	51 (16.8%)	**< 0.001**
Gravidity[a]	2 (1–3)	2 (1.25–3)	0.37
Parity[b]			0.16
Nulliparity	103 (34.0%)	87 (28.7%)	
Multiparity	200 (66.0%)	216 (71.3%)	
Previous CS[a]	0 (0–0)	0 (0–0)	0.70
Maternal systemic disease[b]	41 (13.5%)	11 (3.6%)	**< 0.001**
Ability to recall LMP[b]	261 (86.4%)	181 (59.7%)	**< 0.001**
Hb before delivery (g/dL)[a]	11.7 (10.7–12.8)	11.8 (10.7–13.0)	0.38
HbsAg positive[b]	3 (1%)	2 (0.7%)	0.99
Anti-HIV positive[b]	0 (0%)	0 (0%)	0.99
Anti-HCV positive[b]	0 (0%)	1 (0.3%)	0.50

[a] Median (25th–75th percentile)

[b] Number (Percentage%)

CS: Cesarean section, Hb: Hemoglobin, HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HIV: Human immunodeficiency virus, LMP: Last menstrual period

Table 2 Comparison of antenatal care between Turkish and Syrian refugee groups

	Turkish (n = 303)	Syrian refugee (n = 303)	p value
Antenatal visits			**< 0.001**
< 4	114 (37.7%)	209 (69.0%)	
≥ 4	188 (62.3%)	94 (31.0%)	
First trimester combined test	51 (16.8%)	9 (3.0%)	**< 0.001**
Triple test	23 (7.6%)	7 (2.3%)	**0.003**
Quadruple test	21 (6.9%)	6 (2.0%)	**0.005**
Fetal anatomy ultrasound scan	46 (15.2%)	11 (3.6%)	**< 0.001**
Oral glucose tolerance test	42 (13.9%)	15 (5.0%)	**< 0.001**

Number (Percentage%)

women [27 (24–31)] (p < 0.001). Adolescent pregnancy was more common in Syrian refugees (16.8%) than in Turkish women (4.3%) (p < 0.001). However, the proportions of maternal systemic disease and ability to recall LMP were significantly lower in Syrian refugees (p < 0.001).

A comparison of antenatal care between Turkish and Syrian refugee groups is shown in Table 2. The rates of antenatal visits and first trimester combined test, triple test, quadruple test, fetal anatomy ultrasound scan, and oral glucose tolerance test were significantly lower in Syrian refugees (p < 0.001, p < 0.001, p < 0.003, p < 0.005, and p < 0.001, respectively).

A comparison of perinatal and neonatal outcomes between Turkish and Syrian refugee groups is shown in Table 3. There was no difference between the Turkish and Syrian refugee groups in terms of the mode of delivery, Hb

Table 3 Comparison of perinatal and neonatal outcomes between Turkish and Syrian refugee groups

	Turkish (n = 303)	Syrian refugee (n = 303)	p value
All patients			
Mode of delivery[a]			0.80
Vaginal	189 (62.4%)	192 (63.4%)	
CS	114 (37.6%)	111 (36.6%)	
Hb after delivery (g/dL)[b]	10.6 (9.6–11.6)	10.9 (9.5–11.9)	0.13
Gestational age[a]			0.66
< 34 weeks	11 (3.6%)	15 (5%)	
34–37 weeks	28 (9.2%)	34 (11.2%)	
37–42 weeks	262 (86.5%)	253 (83.5%)	
≥ 42 weeks	2 (0.7%)	1 (0.3%)	
Birth weight (g)[a]			0.77
< 2500	24 (7.9%)	29 (9.5%)	
2500–4000	264 (87.1%)	259 (85.5%)	
> 4000	15 (5.0%)	15 (5.0%)	
Apgar score at 5th minute[a]			0.34
< 7	12 (4.0%)	17 (5.6%)	
≥ 7	291 (96.0%)	286 (94.4%)	
Stillbirth[a]	3 (1%)	9 (3%)	0.14
Fetal anomaly[a]	0 (0%)	2 (0.7%)	0.25
Adolescent patients			
Mode of delivery[a]			0.86
Vaginal	10 (76.9%)	38 (74.5%)	
CS	3 (23.1%)	13 (25.5%)	
Hb after delivery (g/dL)[b]	10.2 (8.9–10.8)	10.6 (9.5–11.8)	0.10
Gestational age[a]			0.75
< 34 weeks	1 (9.1%)	2 (3.9%)	
34–37 weeks	1 (9.1%)	6 (11.8%)	
37–42 weeks	9 (81.8%)	43 (84.3%)	
≥ 42 weeks	0 (0%)	0 (0%)	
Birth weight (g)[a]			0.18
< 2500	0 (0%)	7 (13.7%)	
2500–4000	13 (100%)	40 (78.4%)	
> 4000	0 (0%)	4 (7.8%)	
Apgar score (5th minute)[a]			0.50
< 7	0 (0%)	3 (5.9%)	
≥ 7	13 (100%)	48 (94.1%)	
Stillbirth[a]	0 (0%)	1 (2%)	0.80
Fetal anomaly[a]	0 (0%)	0 (0%)	0.99

[a] Number (Percentage%)

[b] Median (25th–75th percentile)

CS: Cesarean section, Hb: Hemoglobin

level after delivery, gestational age, birth weight, Apgar score at the 5th minute, stillbirth, and fetal anomaly in both crude analysis and adolescent subgroup analysis.

The results of unadjusted and adjusted logistic regression analysis for antenatal visits, CS delivery, preterm delivery, and low birth weight among Syrian and Turkish women are shown in Table 4. Although the frequency of less than four

Table 4 Results of unadjusted and adjusted logistic regression analysis for antenatal visits, CS delivery, preterm delivery, and low birth weight among Turkish and Syrian refugee groups (Reference: Turkish group)

Outcome	Unadjusted			Adjusted*		
	OR	(95% CI)	p value	OR	(95% CI)	p value
Model 1: Antenatal visits < 4						
Syrian refugees	3.67	2.62–5.14	**< 0.001**	3.03	2.10–4.36	**< 0.001**
Model 2: CS delivery						
Syrian refugees	0.96	0.69–1.33	0.80	1.17	0.72–1.89	0.53
Model 3: Preterm birth						
Syrian refugees	1.29	0.82–2.03	0.27	1.31	0.80–2.14	0.29
Model 4: Low birth weight						
Syrian refugees	1.29	0.73–2.28	0.39	1.10	0.58–2.08	0.77

*adjusted for maternal age, parity, previous CS, and maternal systemic disease

OR: Odds ratio, CI: Confidence interval, CS: Cesarean section

antenatal in Syrian refugees was 3.67 times higher than that in Turkish pregnant women, it was determined that this outcome was 3.03 times higher when adjusted for age, parity, previous CS, and maternal systemic disease ($p < 0.001$ for both unadjusted and adjusted). It was observed that there was no significant effect of being a Syrian refugee on CS delivery, preterm birth, or low birth weight when adjusted for age, parity, previous CS, and maternal systemic disease ($p = 0.53$, $p = 0.29$, $p = 0.77$, and $p = 0.19$, respectively).

Discussion

The primary results of our study show that during the pandemic, Syrian refugee pregnant women were younger than the Turkish pregnant population; in addition, adolescent pregnancy was more common in the Syrian refugee group. Furthermore, the perinatal and neonatal outcomes of Syrian refugee pregnant women were similar to those of the Turkish pregnant population, despite the former group receiving poorer antenatal care during the COVID-19 pandemic.

Due to the civil war in Syria that has been going on for more than a decade, the vulnerable position of Syrian refugees still continues. Due to its geographically close location as well as religious and cultural similarities, Turkey has become the main country of asylum for Syrian refugees. More than 3.5 million Syrians have been living in Turkey [2]. The camps established in the border regions in 2011 continue to host Syrian refugees. In these camps, health services as well as other basic needs, such as drinking water, food, and bathroom, are provided to refugees. Between 2011 and 2016, approximately 300,000 children and 100,000 pregnant women benefited from health services, and 2 million refugees were vaccinated in Turkey [12]. Although the density of Syrian refugees is higher in areas close to the Syrian border, there are also several refugees living in big cities far from the border, such as Istanbul. In Istanbul, which is the largest city in Turkey with a population of more than

15 million, 540,186 Syrians are located [13]. The Basaksehir district of Istanbul, where the hospital in which this study was conducted is located, is a settlement in which a large proportion of Syrian refugees live. Syrian refugees constitute approximately 3% of Istanbul's total population. Similarly, 3.6% of the deliveries that occurred in our hospital between June 1, 2020 and December 31, 2020 were of Syrian refugee pregnant patients. Therefore, our study population represents a good sample that accurately reflects the Syrian refugee community living in Istanbul.

Although the pandemic affected all aspects of life globally, COVID-19-related outcomes have not been identical for different populations. In the literature, the relationship between ethnicity and COVID-19 has not been clarified owing to the insufficient representation of minorities with different ethnic origins in the studies [14]. However, limited data have shown that ethnicity independently affects the risk of death from COVID-19 [15]. The reason may be multifactorial and related to biology, genetics, socioeconomic status, education level, or social discrimination. All of these possible explanations are also valid problems for Syrian refugees. Equality in healthcare is more important than ever because of the pandemic. Unfortunately, studies have reported discrimination against refugees in this regard [16]. In addition, being a pregnant woman caused additional burdens on the Syrian refugee group. A study investigating pregnant Syrian refugees during the pandemic period revealed that refugees experience isolation, linguistic problems, unsatisfying virtual care, lack of support, difficulties in caring for other children at home due to quarantine, failure to meet postpartum expectations, and fear of getting COVID-19 [17]. Therefore, it can be speculated that pregnant Syrian refugees are likely to be even more vulnerable during unprecedented situations, such as a pandemic. However, there is no study in the literature examining the perinatal and neonatal outcomes of Syrian refugee women during the COVID-19 pandemic.

The legal age of marriage in Syria used to be 18 years for boys and 17 years for girls [18]. In exceptional cases, these age limits could be reduced to 15 years for boys and 13 years for girls. After a recent change, the legal age limit for marriage has been set as 18 for both sexes, whereas the age limit of 15 is accepted for both genders in exceptional cases. It is known that war conditions may also increase adolescent marriages and pregnancies [19]. The United Nations Children's Fund (UNICEF) data show that the adolescent pregnancy rate prior to the war in Syria was 8.7% [20]. However, a study showed that although the adolescent marriage rate among Syrian refugees in Jordan was higher than the national rate in Syria before the war, there was no increase in the adolescent marriage rate after the refugees settled in Jordan [18]. In our study, the adolescent pregnancy rate of Syrians (16.8%) was higher than that in the pre-war data of UNICEF. In addition, there was a statistically significant difference between the Turkish and Syrian populations in terms of adolescent pregnancy rates (4.3% vs. 16.8%, respectively). Similarly, in the literature, the age of Syrian refugee pregnant women was lower than that of the Turkish pregnant population [7, 8, 21]. Therefore, it can be said that the civil war, related social and economic conditions, and cultural reasons affect the adolescent pregnancy rates in Syrian refugees.

Considering other demographic data, the percentage of maternal systemic diseases was found to be lower in Syrian refugees compared with the Turkish pregnant population in our study. However, Ozel et al. [21] showed that there was no difference in the percentage of systemic disease among Syrian refugee pregnant women. This may be due to the fact that the Syrian refugees in our study may have undiagnosed diseases. Studies have reported that refugees have more undiagnosed or unreported conditions than the normal population [22]. In addition, the rate of remembering the LMP in Syrian pregnant women was found to be significantly lower than in Turkish pregnant women. In Erenel et al. [7], more than 90% of Turkish patients were able to recall their LMP; in our study, this percentage was found to be below 25% in Syrian patients. Thus, it may be difficult to calculate gestational age during follow-ups, and first-trimester ultrasound measurements of the fetus are often needed.

The most significant result that we found in our study was regarding the poor antenatal care that Syrian refugees receive. Two-thirds of Syrian refugees received antenatal care less than four times during pregnancy. This situation can be associated with being a refugee after the civil war because when we look at the UNICEF data from 2009, the rate of four or more antenatal visits in Syria was 63.7% [23]. In our study, this rate was 62% in the Turkish pregnant population but 31% in Syrian refugee pregnant women. According to the 2009 UNICEF data, the rates of four or more antenatal visits were similar for Syrian and Turkish women. Based on these data, it can be said that the decrease in the number of antenatal visits of Syrian refugees cannot be attributed solely to cultural reasons and that the war has an effect on the proliferation of this difference. Fortunately, antenatal care for Syrian refugees in Turkey seems to have improved over time. In another study in 2016, the rate of poor antenatal care was significantly higher among Syrian refugees, and only 8% of Syrian refugees went to antenatal follow-up more than twice [7]. Although antenatal care in Syrian refugees is still lower compared with the Turkish pregnant population, it can be considered that Syrian refugees seem to be better at obtaining antenatal care in our study. The fact that five years have passed since this study and the integration of refugees into the healthcare system has been improved may be the main reasons for this difference.

One of the important points is that the number of fetal anomaly screenings performed in the Syrian refugee group was significantly low. A study determined that more than 50% of Syrian refugee women had consanguineous marriages [5]. Consanguineous marriage is very common in Arab culture, as it is believed to have benefits such as strengthening family stability, reducing marriage costs, and establishing more harmony between family members. However, consanguineous marriage poses a risk for pregnancy because it increases the rates of congenital anomalies [24]. Therefore, Syrian refugee pregnant women should be encouraged to screen for fetal anomalies.

Language and cultural differences also affect obstetric outcomes [25]. A study suggested that poor antenatal care received by Syrian refugee pregnant women results from language, culture, reduced social support, and insufficient knowledge [26]. Therefore, we assumed that social integration into society also improved antenatal care in Syrian refugee women over time. Nevertheless, it is necessary to raise awareness about antenatal care among Syrian pregnant refugees because its quality is still worse among this demographic compared with the Turkish pregnant population.

Previous studies have compared the perinatal and neonatal outcomes of Syrian refugees and the Turkish population. In a study by Sayili et al. [27], pregnancy and neonatal outcomes were found to be similar in Syrian and Turkish populations. Similar maternal and neonatal outcomes in Syrian and Turkish populations have also been demonstrated by other studies [7, 28]. However, there are different results in the literature. Ozel et al. [21] found that the rates of preterm labor, preterm premature rupture of membranes, lower birth weight, and maternal anemia were significantly higher in Syrian refugees compared to Turkish patients. In our study, no significant difference was found in terms of perinatal and neonatal outcomes. Increased social integration due to

cultural and religious similarities between Syria and Turkey and the prolongation of the time refugees spend in Turkey may be possible explanations for these findings [29]. Moreover, the provision of free health services to Syrian refugees in Turkey plays a key role in affecting the perinatal and neonatal outcomes of refugees.

Our study has certain strengths and limitations. To our knowledge, this study is the first to compare the perinatal and neonatal outcomes of Syrian refugee pregnant women exclusively during the COVID-19 pandemic. Basaksehir Cam and Sakura City Hospital, which was opened as one of the largest hospitals in Istanbul during the pandemic, provides health services to a large number of Syrian refugee patients, especially due to its location. Therefore, this study can be considered to reflect the Syrian refugee population. Providing free healthcare and having an adequate team of interpreters also helped eliminate potential confounders. In addition, the power of our study was calculated as 99.9%. However, the relatively limited number of patients due to the availability of a short time frame is the main limitation of our study. Investigating perinatal and neonatal outcomes with a larger sample would increase the generalizability of our results.

New Contribution to the Literature

Although they have a younger maternal age and poorer antenatal care, no difference was found between the perinatal and neonatal outcomes of Syrian refugees and Turkish patients during the COVID-19 pandemic. Health problems of the vulnerable minority should be investigated with further studies and proactively resolved by health authorities.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

References

1. The United Nations High Commissioner for Refugees. (UNHCR). https://www.unhcr.org/syria-emergency.html. Accessed 01 Apr 2022.
2. The United Nations High Commissioner for Refugees (UNHCR). https://data2.unhcr.org/en/situations/syria#_ga=2.169822049.1122185987.1648793318-399388866.1648793318. Accessed 01 Apr 2022.
3. Republic of Turkey Ministry of Interior Directorate General of Migration Management., Migration Statistics, Temporary Protection. https://en.goc.gov.tr/temporary-protection27. Accessed 01 Apr 2022.
4. Erdogan M. Syrians Barometer. www.unhcr.org/tr/yayinlar. 2021 Sep. Accessed 01 Apr 2022.
5. Şimşek Z, Yentur Doni N, Gül Hilali N, Yildirimkaya G. A community-based survey on syrian refugee women's health and its predictors in Şanliurfa, Turkey. Women Health. 2018;58(6):617–31.
6. Drescher A, Kiselev N, Akhtar A, Acarturk C, Bryant RA, Ilkkursun Z, et al. Problems after flight: understanding and comparing Syrians' perspectives in the Middle East and Europe. BMC Public Health. 2021;21(1):717.
7. Erenel H, Aydogan Mathyk B, Sal V, Ayhan I, Karatas S, Koc Bebek A. Clinical characteristics and pregnancy outcomes of syrian refugees: a case-control study in a tertiary care hospital in Istanbul, Turkey. Arch Gynecol Obstet. 2017;295(1):45–50.
8. Vural T, Gölbaşı C, Bayraktar B, Gölbaşı H, Yıldırım A. Are syrian refugees at high risk for adverse pregnancy outcomes? A comparison study in a tertiary center in Turkey. J Obstet Gynaecol Res. 2021;47(4):1353–61.
9. Kluge HHP, Jakab Z, Bartovic J, D'Anna V, Severoni S. Refugee and migrant health in the COVID-19 response. Lancet. 2020;395(10232):1237–9.
10. Ganchimeg T, Ota E, Morisaki N, Laopaiboon M, Lumbiganon P, Zhang J, et al. Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. BJOG. 2014;121(Suppl 1):40–8.
11. Organization WH. WHO antenatal care randomized trial: manual for the implementation of the new model. World Health Organization; 2002. p. 9241546298.
12. Tayfur I, Günaydin M, Suner S. Healthcare Service Access and Utilization among Syrian Refugees in Turkey.Ann Glob Health. 2019;85(1).
13. T R Presidency of Migration Management. https://en.goc.gov.tr/. Accessed 01 Apr 2022.
14. Chastain DB, Osae SP, Henao-Martínez AF, Franco-Paredes C, Chastain JS, Young HN. Racial disproportionality in Covid clinical trials. N Engl J Med. 2020;383(9):e59.
15. Webb Hooper M, Nápoles AM, Pérez-Stable EJ. COVID-19 and Racial/Ethnic disparities. JAMA. 2020;323(24):2466–7.
16. Da Mosto D, Bodini C, Mammana L, Gherardi G, Quargnolo M, Fantini MP. Health equity during COVID-19: a qualitative study on the consequences of the syndemic on refugees' and asylum seekers' health in reception centres in Bologna (Italy). J Migr Health. 2021;4:100057.
17. Stirling Cameron E, Ramos H, Aston M, Kuri M, Jackson L. COVID affected us all:" the birth and postnatal health experiences of resettled syrian refugee women during COVID-19 in Canada. Reprod Health. 2021;18(1):256.
18. Sieverding M, Krafft C, Berri N, Keo C. Persistence and change in Marriage Practices among syrian Refugees in Jordan. Stud Fam Plann. 2020;51(3):225–49.
19. Cetorelli V. The Effect on Fertility of the 2003–2011 war in Iraq. Popul Dev Rev. 2014;40(4):581–604.

20. The United Nations Children's Fund (UNICEF) Data Warehouse. https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SYR.MNCH_BIRTH18.&startPeriod=1970&endPeriod=2023.

21. Ozel S, Yaman S, Kansu-Celik H, Hancerliogullari N, Balci N, Engin-Ustun Y. Obstetric outcomes among syrian Refugees: a comparative study at a Tertiary Care Maternity Hospital in Turkey. Rev Bras Ginecol Obstet. 2018;40(11):673–9.

22. Kandasamy T, Cherniak R, Shah R, Yudin MH, Spitzer R. Obstetric risks and outcomes of refugee women at a single centre in Toronto. J Obstet Gynaecol Can. 2014;36(4):296–302.

23. The United Nations Children's Fund (UNICEF) Data Warehouse. https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SYR.MNCH_ANC4.&startPeriod=1970&endPeriod=2023

24. Bittles AH. Consanguineous marriages and congenital anomalies. Lancet. 2013;382(9901):1316–7.

25. Thomas PE, Beckmann M, Gibbons K. The effect of cultural and linguistic diversity on pregnancy outcome. Aust N Z J Obstet Gynaecol. 2010;50(5):419–22.

26. Vurgec B, Surucu S, Köroglu C, Ezzo H. Perinatal care experiences of immigrant syrian women: a qualitative phenomenological study. East Mediterr Health J. 2021;27(12):1173–81.

27. Sayili U, Ozgur C, Bulut Gazanfer O, Solmaz A. Comparison of Clinical Characteristics and Pregnancy and Neonatal Outcomes Between Turkish Citizens and Syrian Refugees with High-Risk Pregnancies.J Immigr Minor Health. 2021:1–9.

28. Güngör ES, Seval O, İlhan G, Verit FF. Do syrian refugees have increased risk for worser pregnancy outcomes? Results of a tertiary center in İstanbul. Turk J Obstet Gynecol. 2018;15(1):23–7.

29. Furkan Dağcioğlu B, Baydar Artantaş A, Keskin A, Karataş Eray İ, Üstü Y, Uğurlu M. Social adaptation status of syrian refugee physicians living in Turkey. Cent Eur J Public Health. 2020;28(2):149–54.