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Research Article

Urban-rural differences in the pregnancy-related adverse outcome

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ABSTRACT

Background: Little is known about potential urban-rural differences in adverse pregnancy outcomes. The purpose of this study is to look into the urban-rural differences in the trend of adverse maternal and neonatal outcomes.
Methods: We retrospectively assessed the pregnancy outcome of singleton pregnant mothers who gave birth at a tertiary hospital in Bandar Abbas, Iran, between January 1st, 2020, and January 1st, 2022. Mothers were divided into two groups based on living residency: 1) urban groupand 2) rural group.Demographic factors, obstetrical factors, maternal comorbidities, and adverse maternal and neonatal outcomeswere extracted from the electronic data of each mother. The Chi-square testwas used to compare differences between the groups for categorical variables. Logistic regression models were used to assess the association of adverse pregnancy, childbirth, and neonatal outcome with living residency.
Results: Of 8888 mothers that gave birth during the study period, 2989 (33.6%) lived in rural areas. Adolescent pregnancy was more common in the rural area. Urban mothers had a higher education than rural mothers. Rural mothers were at higher risk for preterm birth aOR 1.81 (CI:1.24-2.99), post-term pregnancy aOR 1.5 (CI: 1.07-2.78), anemia aOR 2.02 (CI:1.07-2.34), low birth weight (LBW) aOR 1.89 (CI: 1.56-2.11), need for neonatal resuscitation aOR 2.66 (CI: 1.78-3.14), and neonatal intensive care unit (NICU) admission aOR 1.98 (CI:1.34-2.79). On the other hand, the risk of cesarean section was significantly lower compared to urban mothers aOR 0.58 (CI: 0.34-0.99).
Conclusions: Our study discovered that mothers living in rural areas had a higher risk of developing anemia, preterm birth, post-term pregnancies, LBW, need for neonatal resuscitation, and NICU admission, but a lower risk of cesarean section.

1. Introduction

Healthcare issues differ not only between countries but also within countries. Historically, rural areas have had more healthcare problems than urban areas, most likely due to lower healthcare provision and utilization.[1] To achieve the fifth health-related Millennium Development Goal, which is concerned with maternal health, policymakers are being pushed to take preventive measures against adverse pregnancy outcomes, particularly in many low- and middle-income countries.[2] Exploring differences in adverse outcome causes, timing of adverse outcomes relative to pregnancy, and associations between pregnancy-related adverse outcomes and ecologic county-level characteristics such as access to care, residential segregation, or poverty may yield additional information about disparities in urban-rural categories.[3] Pregnancy-related adverse outcomes are a multifaceted problem. Adverse pregnancy outcomes are influenced by a myriad of biological, social, and environmental factors. Numerous studies have found that factors such as maternal education,[4] marital status,[5] pregnancy

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intention,[6] and adolescent pregnancy,[7] have been linked to poor birth outcomes.In the review of the literature, the urban-rural disparities have been found to be related to the pregnancy and childbirth outcomes,[8–10] but unfortunately, little is known about potential urban-rural differences in adverse pregnancy outcomes in Iran. The purpose of this study is to look into the urban-rural differences in the trend of adverse maternal and neonatal outcomes in the city of Bandar abbas; the southern city of Iran.

2. Methods

We retrospectively assessed the pregnancy outcome of singleton pregnant mothers who gave birth at Khaleej-e-Fars Hospital (a referral tertiary hospital with the highest rate of births in Hormozgan province) in Bandar Abbas, Iran, between January 1st, 2020, and January 1st, 2022. Using electronic patient records, data were extracted by trained collectors from the "Iranian Maternal and Neonatal Network (IMaN Net)," a valid national system.IMaN Net is a comprehensive system for registering maternal and newborn information on the results of each delivery, which is completed daily by midwives in all birth centers and hospitals in an integrated manner throughout Iran. Mothers were divided into two groups based on living residency: 1) urban group and 2) rural group. The classification of mothers was done based on the information of the mother's place of residence, which was announced by the mother during admission to the hospital. Demographic factors (age, educational level, medical insurance, access to prenatal care facilities, smoking status), obstetrical factors (maternal age, gestational age, parity, use of assisted reproductive technology (ART), onset of labor, mode of delivery, newborn sex, newborn weight), maternal comorbidities (overt diabetes mellitus, chronic hypertension, cardiovascular disease, thyroid dysfunction, drug addiction, hepatitis, anemia, infertility, and COVID-19 at the time of admission), adverse maternal outcome (oligohydramnios, polyhydramnios, preeclampsia, gestational diabetes mellitus (GDM), abnormal placentation, placenta abruption, chorioamnionitis, intrauterine growth restriction (IUGR), and intrauterine fetal death (IUFD), shoulder dystocia, perineal laceration, post-partum hemorrhage, intensive care unit (ICU) admission, and maternal death), and neonatal outcome (low birth weight (LBW), macrosomia, congenital malformation, asphyxia, childbirth trauma (clavicle fracture, Erb palsy, Klumpke palsy), need for resuscitation, neonatal intensive care unit (NICU) admission, and newborn death) were extracted from electronic data of each mother. The diagnostic criteria for each condition in our setting are defined below:

- GDM: ($\geq$92, 180, and 153 mg/dl for fasting, 1-h and 2-h plasma glucose concentration respectively), after a 75 g oral glucose tolerance test (OGTT).
- LBW:Weight at the birth of <2500 g
- IUGR: Ultrasound-estimated fetal weight below the 10th percentile for gestational age.
- Polyhydramnios: The deepest vertical pool of more than 8 cm or amniotic fluid index (AFI) more than the 95th percentile for the corresponding gestational age.
- Oligohydramnios: AFI $\leq$5 cm.
- Preeclampsia:Hypertension – systolic BP > 140 mmHg or diastolic BP > 90 mm Hg or both on two occasions at least 4 h apart combined with proteinuria after 20 weeks of gestation.
- Post-term pregnancy: Gestational age after 42 weeks of pregnancy.
- COVID-19: A positive COVID-19 test.

The IBM Statistical Package for the Social Sciences Statistics, version 25, was used to examine the data (IBM Corp, Armonk, NY). Categorical variables are presented as numbers and frequencies (%). The Chi-square testwas used to compare differences between the groups for categorical variables. Logistic regression models were used to assess the association between adverse pregnancy outcomes and living residency (the urban area was set as a reference group). The result was presented as odds ratio (OR) or adjusted odds ratio (aOR) after adjusting for confounders and a 95% confidence interval (CI). $P < 0.05$ was considered statistically significant, and all statistical tests were two-tailed.

3. Results

8888 singleton mothers gave birth at our tertiary center during the study period. 2989 (33.6%) of them lived in rural areas. Table 1 shows the demographic differences between those who live in rural and urban areas.Maternal age and education were the only two variables statistically different between rural and urban mothers. In terms of obstetrical factors, rural mothers were more likely to have preterm birth and post-term pregnancy ($p = 0.023$). The need for labor induction was nearly identical in both groups, but the rate of spontaneous onset of labor was higher in rural mothers than in urban mothers (61.3% vs. 55.3%). Vaginal birth was more common among rural mothers, while cesarean section was more common among urban mothers. Mild to moderate anemia (Hb 7–10 g/dl) was more common in rural mothers in terms of maternal comorbidities (Table 2).

Table 3 shows the prevalence of adverse pregnancy outcomes. There were no significant differences in maternal outcomes between rural and urban mothers; however, adverse neonatal outcomes such as LBW, need for resuscitation, and NICU admission was more common in rural mothers.

Table 4 represents the adverse pregnancy outcome associated with rural living residency. Bivariate logistic regression shows an association between gestational age, mode of delivery, anemia, LBW, need for resuscitation, and NICU admission. After adjusting for confounders (demographic factors and the onset of labor) the analysis showed that rural mothers were at higher risk for preterm birth aOR 1.81 (CI:1.24-2.99), post-term pregnancy aOR 1.5 (CI: 1.07-2.78), anemia aOR2.02 (CI:1.07-2.34), LBW aOR 1.89 (CI: 1.56-2.11), need for newborn resuscitation aOR 2.66 (CI: 1.78-3.14), and NICU admission aOR 1.98 (CI:1.34-2.79). On the other hand, the risk of cesarean section was significantly lower compared to urban mothers aOR 0.58 (CI: 0.34-0.99).

4. Discussion

Living in a rural or remote area can make advanced obstetric and neonatal care difficult to obtain, potentially increasing the risk of adverse maternal and neonatal outcomes. This study aimed to look at the urban-rural disparity in the trend of cumulative adverse maternal and neonatal outcomes. First, we examined the demographic differences between rural and urban mothers.Demographic transitions may have an impact on

Table 1
Demographic characteristics of women delivering at Khaleej-e-Fars Hospital, Bandar Abbas, Iran, January 1, 2020 - January 1, 2022 n(%).

Demographic characteristics	Urban (n = 5899)	Rural (n = 2989)	Total (n = 8888)	*P*-value
Age (Years)				<0.001
13–19	308 (5.2)	226 (7.6)	534 (6.0)	
20–34	4309 (73.1)	2190 (73.3)	6499 (73.1)	
35 and above	1282 (21.7)	573 (19.2)	1855 (20.9)	
Educational level				<0.001
Illiterate	350 (5.9)	207 (6.9)	557 (6.3)	
Elementary	1648 (27.9)	1082 (36.2)	2730 (30.7)	
High school/Diploma	2770 (47.0)	1320 (44.2)	4090 (46.0)	
Advanced	1131 (19.2)	380 (12.7)	1511 (17.0)	
Access to prenatal care				0.089
Yes	5855 (99.3)	2956 (98.9)	8811 (99.1)	
No	44 (0.7)	33 (1.1)	77 (0.9)	
Medical insurance				0.068
Yes	5709 (96.8)	2915 (97.5)	8624 (97.0)	
No	190 (3.2)	74 (2.5)	264 (3.0)	
Smoking				0.761
Yes	13 (0.2)	8 (0.3)	21 (0.2)	
No	5886 (99.8)	2981 (99.7)	8867 (99.8)	

Table 2
Obstetrical and medicalcharacteristics of women delivering at Khaleej-e-Fars Hospital, Bandar Abbas, Iran, January 1, 2020 - January 1, 2022 n(%).

Variables		Urban (n = 5899)	Rural (n = 2989)	Total (n = 8888)	*P*-value
Obstetrical	**Gestational age**				0.023
	Less than 37 weeks	795 (13.5)	450 (15.1)	1245 (14.0)	
	37–40 weeks	4321 (73.2)	2115 (70.8)	6436 (72.4)	
	40^{+1}-41^{+6} weeks	669 (11.3)	346 (11.6)	1015 (11.4)	
	More than 42 weeks	114 (1.9)	78 (2.6)	192 (2.2)	
	Parity				0.394
	Primiparous	1658 (28.1)	849 (28.4)	2507 (28.2)	
	Multiparous (2–5 parity)	4093 (69.4)	2051 (68.6)	6144 (69.1)	
	Grand multiparous (6 parity and more)	148 (2.5)	89 (3.0)	237 (2.7)	
	ART				0.842
	No	5881 (99.7)	2979 (99.7)	8860 (99.7)	
	Yes	18 (0.3)	10 (0.3)	28 (0.3)	
	Onset of labor				<0.001
	Spontaneous	3265 (55.3)	1833 (61.3)	5098 (57.4)	
	Induction of labor	1381 (23.5)	688 (23.0)	2069 (23.2)	
	Cesarean before the start of labor	1253 (21.2)	468 (15.7)	1721 (19.4)	
	Mode of delivery				<0.001
	Vaginal delivery	3622 (61.4)	2226 (74.5)	5848 (65.8)	
	Instrumental delivery (vacuum)	49 (0.8)	34 (1.1)	83 (0.9)	
	Cesarean section	2228 (37.8)	729 (24.4)	2957 (33.3)	
	Newborn sex				0.601
	Male	3021 (51.2)	1536 (51.4)	4557 (51.2)	
	Female	2878 (48.8)	1453 (48.6)	4331 (48.4)	
	Newborn weight				0.290
	Less than 2500 g	779 (13.2)	439 (14.7)	1218 (13.7)	
	2500–4000 g	4997 (84.7)	2490 (83.3)	7487 (84.2)	
	More than 4000 g	123 (2.1)	60 (2.0)	183 (2.1)	
Comorbidities	**Infertility**				0.902
	No	5800 (98.3)	2939 (98.3)	8739 (98.3)	
	Yes	99 (1.7)	50 (1.7)	149 (1.7)	
	Anemia				<0.001
	No	5754 (97.5)	2877 (96.3)	8631 (97.1)	
	Hemoglobin 7-10 gm/dl	65 (1.1)	86 (2.9)	151 (1.7)	
	Hemoglobin less than 7 gm/dl	79 (1.4)	31 (1.1)	110 (1.2)	
	Cardiovascular disease				0.312
	No	5845 (99.1)	2948 (98.6)	8793 (98.9)	
	Yes	54 (0.9)	41 (1.4)	95 (1.1)	
	Pyelonephritis				0.455
	No	5895 (99.9)	2985 (99.9)	8880 (99.9)	
	Yes	4 (0.1)	4 (0.1)	8 (0.1)	
	Drug addiction				0.102
	No	5856 (99.3)	2982 (99.8)	8838 (99.4)	
	Yes	43 (0.7)	7 (0.2)	50 (0.6)	
	Chronic Hypertension				0.237
	No	5828 (98.8)	2962 (99.1)	8790 (98.9)	
	Yes	71 (1.2)	27 (0.9)	98 (1.1)	
	COVID-19				0.650
	No	5810 (98.5)	2940 (98.4)	8750 (98.4)	
	Yes	89 (1.5)	49 (1.6)	138 (1.6)	
	Overt Diabetes				0.734
	No	5881 (99.7)	2977 (99.6)	8858 (99.7)	
	Yes	18 (0.3)	12 (0.4)	30 (0.3)	
	Thyroid dysfunction				0.074
	No	5245 (88.9)	2636 (88.2)	7881 (88.7)	
	Yes	654 (11.1)	353 (11.8)	1007 (11.3)	
	Hepatitis				0.705
	No	5877 (99.6)	2980 (99.7)	8857 (99.7)	
	Yes	22 (0.4)	9 (0.3)	31 (0.3)	

ART: Assisted reproductive technology.

trends in urban-rural health disparities, as some rural areas have become more isolated as more people move to cities. Several explanations for the urban-rural disparities in adverse birth outcomes have been proposed, including increased smoking prevalence,[8] health care disparities,[9] and increased exposure to environmental hazards.[10]According to our findings, adolescent pregnancy was more common in rural areas (7.6% vs. 5.2%). In general, urban mothers had a higher education than rural mothers, with 19.2% having advanced academic education compared to 12.7% of rural mothers. Rural mothers had slightly lower access to medical insurance and prenatal care facilities, but this was not statistically significant. One of the most important reasons is that in recent years, the Iranian Ministry of Health has focused on establishing pregnancy centers even in the most remote areas of the country. This important thing has been done to eliminate discrimination and also to improve the health index of maternal care and reduce maternal mortality. In addition, the "rural medical insurance" created for low-income groups living in rural area is another reason for the lack of difference between urban and rural mothers in terms of access to medical insurance.

The prevalence of smoking mothers was nearly identical in both groups. In terms of comorbidities, anemia was more common in rural mothers.

Based on our findings there was no association between adverse maternal outcomes and living residency. A previous study by Lisonkova et al. showed a significant association between rural residence and severe maternal morbidity, in particular, a significant 2-fold increase in the rates of life-threatening conditions such as eclampsia, obstetric embolism, and uterine dehiscence or rupture among women in rural areas.[11] The discrepancy between our findings and Lisonkova et al. could be explained by the fact that rural mothers in our study had a high rate of access to prenatal care and medical insurance, which are important determinants of health issues overall.

On the other hand, according to our findings, adverse neonatal outcomes were strongly associated with living residency. Rural mothers were at higher risk for preterm birth. This has been previously reported by another study.[11] The observed disparities in gestational age at birth by living residency are thought to be related to individual-level socioeconomic status differences. Lower socioeconomic status individuals bear a greater burden of a variety of adverse health outcomes, and there is a consistent social gradient in the risk of preterm birth across various measures of individual-level socioeconomic status including the maternal

Table 3
Adverse maternal and neonatal outcomes of women delivering at Khaleej-e-Fars Hospital, Bandar Abbas, Iran, January 1, 2020 - January 1, 2022 n(%).

Variables		Urban (n = 5899)	Rural (n = 2989)	Total (n = 8888)	*P*-value
Adverse maternal outcome	**Oligohydramnios**				0.301
	No	5345 (90.6)	2720 (91.0)	8065 (90.8)	
	Yes	554 (9.4)	269 (9.0)	823 (9.2)	
	Polyhedramnios				0.430
	No	5728 (97.1)	2893 (96.8)	8621 (97)	
	Yes	171 (2.9)	96 (3.2)	267(3)	
	Preeclampsia				0.145
	No	5500 (93.2)	2811 (94)	8311 (93.5)	
	Yes	399 (6.8)	178 (6.0)	577 (6.5)	
	GDM				0.709
	No	5026 (85.2)	2544 (85.1)	7570 (85.2)	
	Yes	873 (14.8)	445 (14.9)	1318 (14.8)	
	Abnormal placentation (Acreta/Previa)				0.215
	No	5879 (99.7)	2973 (99.5)	8852 (99.6)	
	Yes	20 (0.3)	16 (0.5)	36 (0.4)	
	Placenta abruption				0.718
	No	5691 (96.5)	2882 (96.4)	8573 (96.4)	
	Yes	208 (3.5)	107 (3.6)	315 (3.6)	
	Choriamenionitis				0.854
	No	5876 (99.6)	2979 (99.7)	8855 (99.6)	
	Yes	23 (0.4)	10 (0.3)	33 (0.4)	
	IUGR				0.113
	No	5720 (97.0)	2879 (96.3)	8599 (96.7)	
	Yes	179 (3.0)	110 (3.7)	289 (3.3)	
	IUFD				0.439
	No	5832 (98.9)	2959 (99.0)	8791 (98.9)	
	Yes	67 (1.1)	30 (1.0)	97 (1.1)	
	Shoulder dystocia				0.509
	No	5859 (99.3)	2965 (99.2)	8824 (99.3)	
	Yes	40 (0.7)	24 (0.8)	64 (0.7)	
	Perineal lacerations (grade 3 or 4)				0.805
	No	5895 (99.9)	2987 (99.9)	8883 (99.9)	
	Yes	3 (0.1)	1 (0.1)	5 (0.1)	
	Post-partum hemorrhage				0.089
	No	5803 (98.4)	2922 (97.8)	8725 (98.2)	
	Yes	96 (1.6)	67 (2.1)	163 (1.8)	
	ICU Admission				0.076
	No	5876 (99.6)	2958 (99.0)	8834 (99.4)	
	Yes	23 (0.4)	31 (1.0)	54 (0.6)	
	Maternal death				0.899
	No	5897 (99.9)	2988 (99.9)	8885 (99.9)	
	Yes	2 (0.1)	1 (0.1)	3 (0.1)	
Adverse neonatal outcome	**LBW**				0.041
	No	5120 (96.8)	2550 (95.3)	7670 (86.3)	
	Yes	779 (13.2)	439 (14.7)	1218 (13.7)	
	Macrosomia				0.843
	No	5776 (97.9)	2929 (98.0)	8705 (97.9)	
	Yes	123 (2.1)	60 (2.0)	183 (2.1)	
	Congenital malformation				0.246
	No	5837 (98.9)	2949 (98.7)	8786 (98.9)	
	Yes	102 (1.1)	62 (1.1)	40 (1.3)	
	Asphyxia				0.433
	No	5843 (99.1)	2955 (98.9)	8798 (99.0)	
	Yes	56 (0.9)	34 (1.1)	90 (1.0)	
	Childbirth trauma				0.561
	No	5889 (99.9)	2981 (99.8)	8870 (99.9)	
	Yes	3 (0.1)	6 (0.2)	9 (0.1)	
	Need for neonate resuscitation				0.002
	No	5419 (91.9)	2665 (89.2)	8084 (91.0)	
	Yes	480 (8.1)	324 (10.8)	804 (9.0)	
	NICU Admission				0.004
	No	5417 (91.8)	2696 (90.2)	8113 (91.3)	
	Yes	482 (8.2)	293 (9.8)	775 (8.7)	
	Newborn death				0.895
	No	5873 (99.6)	2977 (99.6)	8850 (99.6)	
Yes	26 (0.4)	12 (0.4)	38 (0.4)		

LBW: Low birth weight; IUFD: Intrauterine fetal death; IUGR: Intrauterine growth retardation.
GDM: Gestational diabetes mellitus; ICU: Intensive care unit; NICU: Neonatal intensive care unit.

Table 4
Adverse pregnancy outcomesassociated with rural living residency.

VARIABLES	OR (95% CI)	*P*-value	aOR (95% CI)	*P*-value
Gestational age				
Less than 37 weeks	2.7 (1.03-4.05)	0.004	1.8 (1.24-2.99)	0.019
37–41^{+6}	Ref			
More than 42weeks	1.9 (0.99-3.12)	0.034	1.5 (1.07-2.78)	0.045
Mode of delivery				
Vaginal delivery	Ref			
Instrumental delivery (vacuum)	1.78 (0.78-2.12)	0.134	1.04 (0.99-1.56)	0.402
Cesarean section	0.23 (0.12-0.99)	<0.001	0.58 (0.34-1.01)	0.003
Anemia (g/dl)				
Hb > 10	Ref			
Hb 7-10	2.12 (1.34-3.04)	0.002	2.02 (1.07-2.34)	0.029
Hb < 7	0.87 (0.45-1.34)	0.348	0.95 (0.67-1.56)	0.612
LBW	2.78 (1.56-4.01)	0.034	1.89 (1.56-2.11)	0.046
Need for neonate resuscitation	3.12 (1.98-4.02)	0.006	2.66 (1.78-3.14)	0.031
NICU Admission	2.67 (1.12-5.23)	0.003	1.98 (1.34-2.79)	0.037

OR: Odds Ratio.
aOR: adjusted Odds Ratio.
NICU: Neonatal intensive care unit; LBW: Low birth weight.

level of education and income, marital and employment status, and type of health insurance.[12] Even after controlling for demographic factors, the link between preterm birth and living residency remained significant. This raises the possibility that other factors such as anemia are influencing the occurrence of preterm birth in rural mothers. Maternal anemia

during pregnancy can be considered a risk factor for preterm birth.[13]

The other negative neonatal outcome associated with residency was LBW, with rural mothers having twice the risk of having LBW newborns as urban mothers. Part of this may be due to a higher incidence of prematurity, which leads to lower birth weight, and some may be due to a higher incidence of anemia, which is a risk factor for LBW,.[14] Post-term pregnancy (gestational age more than 42 weeks) were more prevalent among rural mothers. We could not find any previous studies linking post-term pregnancy to living residency. The mother is required to visit a well-equipped medical center at least several times a week for fetal heart rate tracing and ultrasound in post-term pregnancies. Due to the distance dimension, this is not always possible for rural mothers. The burden of traveling for 200–400 km could affect the mother's decision to visit an obstetrician. As a result, a significant number of these mothers wait until the last day of delivery before going to the hospital.

The rate of neonatal resuscitation and NICU admission was strongly related to living residency. Rural mothers were at higher risk for neonatal resuscitation and NICU admission. Neonatal morbidities such as prematurity, LBW, and post-term pregnancy all increase the likelihood of resuscitation and NICU admission. However, in linewitha previous study,[11] the rate of neonatal death was similar in urban and rural mothers.

Our study's most intriguing finding was that rural mothers had a lower risk of cesarean section. Living in a rural area appears to be a protective factor for cesarean delivery. One of the reasons can be the desire of rural women to have more children, therefore, in the culture of rural Iranian women, cesarean section is condemned because it limits the chances of having children.[15,16] Nonetheless, this issue is very important, and deep studies should be done to investigate the cause of the difference. An investigation into the indications for cesarean section in rural and urban mothers would aid us in better understanding the reasons for these differences.

The strength of our study is that our study registers are of high quality and in accordance with childbirth records. We investigated various maternal and neonatal outcomes. Our study was conducted retrospectively, which is still a limitation. The database did not allow for the precise timing of the various events during pregnancy. More data was missing for variables, such as body mass index. Although we chose the referral tertiary hospital with the highest rate of births annually, the result of the analysis of data from only one hospital cannot be generalized.

5. Conclusions

Our study discovered that mothers living in rural areas had a higher risk of developing an adverse pregnancy outcome, such as anemia, preterm birth, post-term pregnancies, LBW, neonatal resuscitation need, and NICU admission, but a lower risk of cesarean section.More research is required to better understand the reasons for the observed urban-rural differences and to guide a multifaceted response to reduce adverse neonatal outcomes.

Ethical approval

This study complies with the Declaration of Helsinki and was performed according to ethics committee approval. The Ethics and Research Committee of the Hormozgan University of Medical Sciences approved the study (number: HUMS.REC.1401.115).

Consent to participate from patients

The records of all patients who provided informed consent for using their data for research purposes were analyzed. In cases of illiteracy, their legal guardians provided informed consent. Statistical analysis was performed with patient anonymity following ethics committee regulations.

Consent for publication

Not applicable.

Declaration competing interest

The authors declare that they have no competing interests.

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