Risk Factors Associated with Premature Births in Erbil City: A Case-Control Study

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ABSTRACT

Background: Premature birth is one of the major causes of mortality and morbidity among newborn babies. There are many factors that induce prematurity. This study aims to investigate the common risk factors associated with premature births in Erbil City.

Methods: Quantitative design, descriptive-analytic analysis and a retrospective study were used. The study was conducted at Raparin Teaching Hospital for Children (RTHC) in Erbil city from September 1st, 2021 to September 1st, 2022. To engage in the study, non -probability purposive sample of 510 mother-newborn pairs admitted to a premature intensive care unit (255 as case group, 255 as a control group) was taken. The statistical analysis program Statistical Package for the Social Sciences (SPSS) Version 25 was used to analyze the data.

Results: The study reveals that the educational level, economic status, Body Mass Index of the mother and types of delivery have a highly significant association with the mother's socio-demographic characteristics at a p-value of 0.008, < 0.001, 0.019 and < 0.001respectively. The study found a highly differences between: risk factors during pregnancy among study and control groups, including gestational hypertension, gestational diabetes mellitus, Urinary Tract Infection (UTIs), anemia, vaginal bleeding, preterm premature rupture of membranes, thyroid disease, psychological problems, infection with covid-19, polyhydramnios and oligohydramnios, at p-value of < 0.001 respectively.

Conclusion: The study concluded that gestational hypertension, gestational diabetes, thyroid diseases, psychological problems, COVID-19, Premature rapture of the membrane, polyhydramnios and oligohydramnios are the main factors behind premature births in Erbil city.

Keywords: Risk Factors; Premature Birth; Uterine Hemorrhage; Urinary Tract Infection.

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INTRODUCTION

Approximately 15 million babies are born preterm annually worldwide. Preterm birth is the leading cause of death among children, accounting for 18% of all deaths among children aged under 5 years. 35% of all deaths among newborns ≤ 28 days [1]. South Asia accounts for over 60% of preterm births worldwide, In India, 3,341,000 babies are born too early for the expected date. Europe rates between (%5-%11) in Unite Status American %11,9 and Australia %7. Despite different developments, developing countries still know to have a high rate of premature birth in South Africa with %15 rates of premature births, India % with 30, Sudan with %31, Malaysia with %10 and Indonesia ranks as the fifth country with the highest preterm birth rate in the world after India, China, Nigeria and Pakistan[4,5].If the baby is born in the 37th week of pregnancy, the birth is regarded as early term, much like this pregnancy period categorization. And if the birth occurs between (37-39 weeks), it is regarded as a full -term pregnancy. Preterm births are those that happen before the 37th week of pregnancy. It was who divided the stages of a child's birth into them [1]. World Health Organization for a premature baby of 37 weeks and this baby can be known by its weight that differs from the normal or normal weight of the baby and its normal weight is often (2300-2500) kg [1,2,3]. These studies stated that in Egypt the prevalence was estimated at 4.1%, with a global prevalence of between 5% and 15%.3 The impact of the prevalence of preterm birth is greater in low- and middle-income countries, where the majority of preterm infant deaths occur [2].Over 84% of preterm births occur at 32–36 weeks of gestation. Only about 5% fall into the extremely preterm range of <28 weeks. The other 10% are born at 28 -32 weeks of gestation. Six countries India, China, Nigeria, Pakistan, Indonesia and the United States account for %50 (7.4 million) of the total preterm births in the world [3].The causes of premature birth include factors such as the mother's pregnancy in adolescence or older than 35 years of pregnancy[2,6]. Maternal age under 20, UTIs, over 34 causes of preterm birth [7]. Another study says young mothers (under 19 years of age) are more likely to give birth prematurely [5].The short period between one pregnancy and another, multiple pregnancies, elective cesarean section induction of Labour and socioeconomic and nutritional conditions, all have an effect as those associated with the fetus such as genetic diseases, placental hemorrhage, uterine distension (twins), previous miscarriages, chronic disease such as high blood pressure, diabetes mellitus, black race and, smoking and alcohol and substance abuse during pregnancy infection and a history of placental abruption.[6]Level of education, preterm birth history, Premature Rupture of Membranes (PROM), prenatal bleeding and prenatal care, maternal care, UTIs, anemia and iron deficiency[5,8]. Some risk factors such as gender babies especially among males [9]. Anemia during pregnancy, socioeconomic status, housing condition, sanitation, number of siblings, quality of medical care, immune system, Urinary Tract Infection (UTIs), low birth weight and prematurity .[10] The social environment, abnormal structure of the uterus especially cervical insufficiency, lifestyle conditions, such as stress, hard work, smoking, short interval between pregnancy, low maternal weight, or low BMI, uterine overdistention with pregnancies increased risk of preterm birth approximately %25, more than half are related to preeclampsia, chronic fetal distress, abruption placenta and placenta insufficiency [11]. Vaginal bleeding,

history of previous preterm birth, previous or premature rupture membrane, history of chronic disease (e.g., neonate disease), lifestyle behavior and marital status [3]. The complications of premature birth that leads to maternal death and fetal death complications are major causes of morbidity and mortality including infection and fetal distress, hemorrhages such as intravascular, respiratory problems such as chronic lung disease, growth and development retardation.[2] A neurological problem such as visual and hearing problems retinopathy (deafness, blindness), severe cerebral palsy, mental retardation, sensory disturbances, hydrocephalus, learning difficulties, language, motor disabilities, cognitive delay and behavioral problem [5]. According to the official census, which has been recorded in Raparin Teaching Hospital for children in Erbil city/ Iraqi Kurdistan region, more than 4320 cases were admitted to NICU and around 700 were preterm babies Official census during the first seven months of 2021 (Raparin Teaching Hospital for Children census Erbil city Iraqi Kurdistan region between 1st of Jan. to 1st of July 2021). The aim of the study was to explore the prevalence and risk factors associated premature babies admitted to Raparin Teaching Hospital or Pediatric.

METHODS

A case-control study design was conducted at the neonatal intensive care unit in Raparin Teaching Hospital for Children (RTHC) in Erbil City. Starting on the 1st of September 2021 and ended to the 1st of September 2022. A convenience non -probability (purposive) sample of 510 mothers and their admitted premature births (255 as a case group, 255 as a control group) were recruited to participate in the study. The sample size has been estimated and determined using the Yamane formula . Where as: n= the sample size. N= the size of the population, e= the alpha-error of 0.05. Mothers who admitted the hospital with both premature and full-term babies, mothers who are willing to participate in the study, babies aged less than 28 days of life are admitted to the hospital (case and control), premature neonates who are admitted to the hospital and give birth before 37 weeks of gestational age, full-term neonates who are admitted to the hospital and labor for 37 weeks of gestational age, were included. Verbal permission was obtained from the mothers before starting the interview. The tool did not consisting of personal information such as personal phone numbers, addresses, or other personal information and the researcher promised to keep the data for confidentiality and anonymity. The questionnaire included the following parts: Part one: the socio-demographic data related to premature births. Part two: socio-demographic characteristic of the mother: Part three: Assessment of risk factors during pregnancy. To assess the risk factors during pregnancy, 14 risk factors had been raised. The ratings included 1 for Yes (have) and 2 for No (haven't). The validity of the questionnaire was evaluated by the experts. Internal consistency reliability was determined and measured by applying Pearson correlation (r) and this was 0.81. The pilot study was conducted on 10 mothers. The data were analyzed using Statistical Package for the Social Sciences (SPSS) software for statistical analysis, Version 25, for calculating descriptive statistical analysis (frequency and percentage). Inferential statistical analysis (Chi-square), (Fisher's Exact Test) were used to identify the association between dependent and independent variables, Mann-Whitney U was used because the data was not normally distributed, to find out the differences between case and control groups, and regression was used to determine the

main factors associated with premature births. The P-value is considered statistically significant if it's ≤ 0.05 which rejects the null hypothesis.

RESULT

It shows that more than half (74.5%) of babies in the study group were less than 2500gm, while 74.11% in the control group were between 2500-4500 gm. A highest percentage (88.6% vs 94.1%) of premature babies in the control group and the control were singleton. Concerning the gestational age, the study shows that more than half (59.2%) of the participants in the study group were between 32-36 weeks and all of the participants in the control group were between 37-42 weeks. Half (51.0%) of the study group had a birth in public hospitals vs. 63.5% in (the control group) 63.5% had a birth in a privet hospital and also only (3.5%) of the study groups had a birth at home. Concerning the gender of neonates, the study shows more than half (54.9%) of premature babies were male, while half (53.7%) of the control group were female. Regarding the birth order, the study shows that one-third (38.0% and 45.1%) of the groups' babies were between 1-2 birth order groups (Table1).

Table 1: Demographical Characteristics of the Babies in the Study Group and Control Groups.

Case and control Groups Biographical characteristics of the babies		Case F. (%)	Control F. (%)
Weight at birth (gram)	< 2500	190(74.5)	0(0)
	2500-4500	65 (25.4)	189(74.1)
	> 4500	0(0)	66(25.8)
Type of pregnancy	Singleton	226(88.6)	240(94.1)
	Twin and more	29(11.4)	15(5.9)
Gestational age (weeks)	< 28	18(7.1)	0(0)
	28-32	86(33.7)	0(0)
	32-36	151(59.2)	0(0)
	37-42	0(0)	255(100)
Place childbirth	Public hospital	130(51.0)	93(36.5)
	Privet hospital	116(45.5)	162(63.5)
	Home	9(3.5)	0(0)
Gender	Male	140(54.9)	118(46.3)
	Female	115(45.1)	137(53.7)
Birth order (Groups)	1 – 2	97(38.0)	115(45.1)
	3 – 4	92(36.1)	89(34.9)
	< 4	66(25.9)	51(20)

The current study found that less than half (38% and 41.2%) in both groups were between 20 and 30 years old. Around one-third; (33.7%) of participants in the study were illiterate, while 29% in the control group were able to read and write. A majority (89.8% vs. 84.3%) in both groups were housewives. Half (56.9%) of the study group participants lived in rural areas, while half (49.4% and 50.6%) of participants in the control group shared their lives between urban and rural areas. More than two-thirds (78.4% and 89.8%) of both groups live in the middle-income economic status. Concerning the Body Mass Index (BMI) of mothers, the study shows that one-third 38.4% in the study group were overweight, while less than half (43.5%) in the control group had a healthy weight. In both groups, more than half (53.7% and 54.1%) delivered their baby by C/S respectively (Table 2).

Table 2: Socio-Demographical Characteristics of the mothers (Study and Control) n= 510

Mother's Socio-Demographical Characteristics		Case F (%)	Control F (%)
Age of mother	< 20	14(5.5)	7(2.7)
	20-30	97(38)	105(41.2)
	31-40	87(34.1)	93(36.5)
	41-50	57(22.4)	50(19.6)
Educational status	Illiterate	86(33.7)	56(22)
	Able to read and write	67(26.3)	74(29)
	Primary school	34(13.3)	59(23.1)
	Secondary school	28(11)	23(9)
	Institute	15(5.9)	19(7.5)
	College	22(8.6)	24(9.4)
	Postgraduate	3(1.2)	0(0)
Occupational status	Government employee	20(7.8)	29(11.4)
	Privet employee	5(2.0)	10(3.9)
	Self-employee	0(0)	0(0)
	Student	1(0.4)	1(0.4)
	Housewife	229(89.8)	215(84.3)
Economic status	Low	53(20.8)	26(10.2)
	Middle	200(78.4)	229(89.8)
	High	2(0.8)	0(0)
Residency area	Urban	110(43.1)	126(49.4)
	Rural	145(56.9)	129(50.6)
BMI of mother	Underweight below 18.5	6 (2.4)	2(0.8)
	Healthy weight 18.5-24.9	83 (32.5)	111(43.5)
	Overweight 25-29.9	98 (38.4)	95(37.3)
	Obese 30 and above	68 (26.7)	47(18.4)
Type of delivery	Vaginal delivery with episiotomy	118(46.3)	117(45.9)
	Cesarian section	137(53.7)	138(54.1)

The results shows that there is a highly significant association between case and control concerning educational level, economic status, BMI of the mother and types of delivery at a p-value of 0.008, < 0.001, 0.019 and < 0.001respectively (Table 3).

Table 3: Association Between Mothers' Socio-demographical Characteristics and Both Case and Control Groups.

Case and control Mother's Socio Demographical Characteristics		Case F (%)	Control F (%)	Test Value	P-Value (Chi-Square)
Age of mother	< 20	14(5.5)	7(2.7)	3.308	0.347 (NS)
	20-30	97(38.0)	105(41.2)		
	31-40	87(34.1)	93(36.5)		
	41-50	57(22.4)	50(19.6)		
Educational status	Illiterate	86(33.7)	56(22)	17.454	0.008 (HS)
	Able to read and write	67(26.3)	74(29)		
	Primary school	34(13.3)	59(23.1)		
	Secondary school	28(11)	23(9)		
	Institute	15(5.9)	19(7.5)		
	College	22(8.6)	24(9.4)		
	Postgraduate	3(1.2)	0(0)		
Economic status	Low	53(20.8)	26(10.2)	14.151	0.001 (HS)
	Middle	200(78.4)	229(89.8)		
	High	2(0.8)	0(0)		
Residency area	Urban	110(43.1)	126(49.4)	2.019	0.155 (NS)
	Rural	145(56.9)	129(50.6)		
BMI of mother	Underweight below 18.5	6 (2.4)	2(0.8)	9.923	0.019 (S)
	Healthy 18.5-24.9	83 (32.5)	111(43.5)		
	Overweight 25-29.9	98 (38.4)	95(37.3)		
	Obese 30 and above	68 (26.7)	47(18.4)		
Type of delivery	Vaginal delivery (with episi-otomy)	118(46.3)	117(45.9)	0.008	0.001 (HS)
	C/S	137(53.7)	138(54.1)		

Concerning the risk factors associated with remature births, the current results reveal that the mothers in control vs. study groups omplained the following factors: gestational hypertension (18.8% vs < 0.001), gestational diabetes mellitus, (2% vs < 0.001), UTIs (98% vs 51.4%), anemia (37% vs < 0.001), vaginal bleeding (52.5% vs 8.2%), premature rupture of membrane (PROM) (14.5% vs < 0.001), psychological problems (13.3% vs 4.7%), COVID-19 (45.5% vs 7.8%), polyhydramnios (31% vs 1.6%) (Table 4).

Table 4: Assessment of Risk Factors Among Mothers During Pregnancy in Both Groups (Study and Control).

Study and control	Study. n.255		Control. n. 255	
Risk factors during pregnancy	Yes F. (%)	N0 F. (%)	Yes F. (%)	N0 F. (%)
Gestational hypertension	48 (18.8)	207(81.2)	0 (0)	255 (100)
Gestational diabetes	5 (2)	250 (98)	0 (0)	255 (100)
UTI	250 (98)	5 (2)	131 (51.4)	124 (48.6)
Anemia	96 (37.6)	159 (62.4)	0 (0)	255 (100)
Vaginal bleeding	134 (52.5)	121 (47.5)	21 (8.2)	234 (91.8)
Premature rupture of membrane (PROM)	37 (14.5)	218 (85.5)	0 (0)	255 (100)
Psychological problems	34 (13.3)	221 (86.7)	12 (4.7)	243 (95.3)
Infected with coronaviruses	116 (45.5)	139 (54.5)	20 (7.8)	235 (92.2)
Polyhydramnios	39(15.3)	216 (84.7)	4 (1.6)	251 (98.4)
Oligohydramnios	79 (31)	176(69)	4 (1.6)	251 (98.4)
Placenta previa	2 (0.8)	253(99.2)	0 (0)	255 (100)

The current study found that there are highly significant differences between the means of the risk factors among study and control group such as; gestational hypertension (0.19 vs. < 0.001), gestational diabetes mellitus (0.02 vs < 0.001) UTIs (0.98 vs 0.51), anemia (0.38 vs < 0.001), vaginal bleeding (0.53 vs 0.05), PROM 0.15 vs < 0.001), psychological problems (0.13 vs 0.05), infection with COVID-19 (0.45 vs 0.08), polyhydramnios (0.15 vs 0.02), oligohydramnios (0.31 vs 0.02), placenta previa (0.01% vs < 0.001) at a p-value of 0.000, 0.025, 0.002 respectively (Table 5).

Table 5: Comparison Between Means of Risk Factors Between Case and Control During Pregnancy.

During Pregnancy	Case		Normal		P-Value ⍰
	Mean	(%)	Mean	(%	
Gestational Hypertension	0.19	(19)	0.00	(0)	0.001 (HS)
Gestational Diabetes mellitus	0.02	(2)	0.00	(0)	0.0250 (S)
UTI	0.98	(98)	0.51	(51)	0.001 (HS)
Anemia	0.38	(38)	0.00	(0)	0.001 (HS)
Vaginal bleeding	0.53	(53)	0.08	(8)	0.001 (HS)
Premature rupture of membrane	0.15	(15)	0.00	(0)	0.001 (HS)
Psychological problems	0.13	(13)	0.05	(5)	0.001 (HS)
Infected with coronaviruses	0.45	(45)	0.08	(8)	0.001 (HS)
Polyhydramnios	0.15	(15)	0.02	(2)	0.001 (HS)
Oligohydramnios	0.31	(31)	0.02	(2)	0.001 (HS)
Placenta previa	0.01	(1)	0.00	(0)	0.157 (NS)

⍰ by Mann-Whitney U

The study found that the place of childbirth, singleton and types of delivery, were the main risk factors behind prematurity and revealed a highly significant association at p-value of 0.000, 0.006 respectively and a significant association between premature births and the factors such as place of childbirth, singleton and type of delivery at p-values of 0.024, 0.031 and 0.044 respectively Table 6).

Table 6: Assessment of Risk Factors During Prenatal Stage (During Pregnancy).

Coefficients					
Main risk factors	**Unstandardized Coefficients**		**Standardized Coefficients**	**t-value**	**P-value**
	B	**Std. Error**	**Beta**		
(Constant)	8.265	0.847		9.75	**< 0.001**
Gestational age	-1.419	0.107	-0.676	-13.2	**< 0.001**
Economic status	-1.006	0.244	-0.230	-4.12	**< 0.001**
Type of family	0.803	0.218	0.202	3.68	**< 0.001**
Age of mother	-0.298	0.108	-0.140	-2.75	**0.006**
Place childbirth	0.384	0.169	0.116	2.27	**0.024**
Single and twin	-0.758	0.348	-0.111	-2.17	**0.031**
Type of delivery	0.368	0.182	0.102	2.02	**0.044**

DISCUSSION

The current study discovered that two-thirds of preterm babies were less than 2500gm, which is consistent with the findings of a study in India and discovered that the majority of premature births were less than 2500gm [12]. The majority of preterm newborns were delivered less than 2.500 grams [13]. The current study found that the majority of babies in both cases and control groups were singleton babies. This result is in agreement with case-control research, which found that most newborns were singleton babies [14].Moreover, the result reveals that half of the participants were ntermediate to late preterm babies, with gestational ages ranging from 32 to 36 weeks. According to a study which studied the factors behind prematurity in Basra city of Iraq, most preterm gestational ages were intermediate to late preterm range [13]. The result confirmed by a Brazilian researcher named Maria reveals that 84.4% of preterm gestational ages were between mild and late preterm [14]. In India, far more data was collected, finding that 93.9% of preterm newborns were between mild and late preterm [15].Half of the women in the study group gave birth at a public hospital, while more than half of the neonates in the control group were delivered to a private hospital. Private hospitals appear to have prioritized childcare above state hospitals. The findings are inconsistent with data from Brazil, which found that 79.1% of preterm newborns were delivered in government institutions [14]. In terms of neonatal gender, the study stated that

more than half of preterm newborns were male. The findings contradicted research that found 45.1%) were male and 54.9% were female [7]. a study confirmed that were 23.2 males and 21.3 females [16]. In terms of birth order, the study found that more than one-third of both groups had a birth order between 1 and 2. one-quarter in case group versus two third in the control group of babies were in second and more birth orders [7], while a study done in Bangladeshi showed that (24.3%) of birth orders were within fourth and more[16].Fewer than half of the findings contradict the findings of a study which conducted in southern India, which discovered that the majority of mothers were between the ages of 20 and 34 years old [12]. Moreover, another study found that 75% of caregivers were < 22 years [15]. Regarding the participant's level of education, the current study found that one-third of participants in the study group were illiterate, whereas one quarter of the mothers in the control group could read and write. The results corresponded with a survey conducted in Bangladeshi, which stated that a large number of mothers graduated from basic and secondary school [16]. While disagreeing with Iranian research which was conducted in Yazd, (Iran) stated that 12% of mothers were illiterate [17]. While, a survey conducted in 2018, reported that 61% of mothers have an elementary school education and 10% are illiterate [13].According to the current study, the majority of the participants in both the study and the control groups were housewives. This finding is consistent with research conducted in Basra , Iraq, which discovered that 89% of mothers were housewives [13].In terms of economic standing, the majority of participants in both groups (study and control) (78.4% and 89.8%) were in the middle. the study disagrees with the findings of the Indian research, which stated that (58% and 39%) of mothers were poor [18]. Moreover, it is not supported by a study which described that the majority of cases were of low socioeconomic status [13]. Moreover, a study confirmed that (54% and 57%) of mothers live in rural areas [18]. More than half of the study group individuals resided in rural regions, whereas half of the control group participants split their time between urban and country locations. The majority (62% of mothers who had preterm infants) resided in rural areas. [13]. Aside from their quality of life, the study found that one-third of the mothers in the study group were overweight, compared to 43.5% in the control group [19]. On the other hand, the present study is corroborated by a Brazilian study that discovered that 20.5% of mothers were overweight and 64% of mothers were healthy [14]. According to China, 20.7% of the mothers were of normal weight [20].

A non-significant link was identified between the age of the mothers in the case and control groups, there was disagreement between our findings and investigations verified that teenagers above the age of 35 are at risk of preterm [2,6,7,5]. While the study discovered a strong relationship between case and control in terms of educational level, economic position, mother's BMI and manner of delivery, prematurity may be caused by a lack of knowledge [5,8], Others added the economic status of the family [10], low maternal weight, or low BMI, multiple pregnancies[11], elective cesarean sections, induction of labor and socioeconomic and nutritional conditions [6].Concerning the risk factors associated with premature births, the current findings show that mothers in both the control and study groups complained about the following: gestational hypertension, gestational diabetes millitus, UTIs, anemia, vaginal bleeding, PROM, psychological problems,

COVID-19 and polyhydramnios. The current study discovered highly significant differences in the means of risk factors among study and control groups, such as gestational hypertension, gestational diabetes mellitus, UTIs, anemia, vaginal bleeding, PROM, psychological problems, infection with COVID-19, polyhydramnios, oligohydramnios and placenta previa. The primary risk factors related to preterm births in the Erbil-Iraqi Kurdistan region. The factors, such as Pre-eclampsia [18]. Premature pre-labor membrane rupture, a history of preterm deliveries, an IUD, genitourinary infections, polyhydramnios or oligohydramnios, chronic conditions such as high blood pressure, diabetes mellitus, black race, smoking and alcohol usage and substance misuse during pregnancy infection, as well as a history of placental abruption[6]. Premature rupture of membranes, prenatal bleeding and prenatal care. Maternal care. Anemia and iron deficiency [5,8]. Anemia during pregnancy [10]. Preeclampsia, chronic fetal distress, abruption placenta and placenta insufficiency .[11]Vaginal bleeding, lifestyle behavior and marital status [3]. UTIs and fetal distress, hemorrhages such as intravascular [2]. A case-control study that included preeclampsia mothers in a case-control of Southern India reported that preeclampsia induced prematurity [12]. the study grees with the results of a case-control study, which was carried out in Brazil and referred to 6.7 % of cases and 15.4% of control [14]. 8.4% vs. 8.1% in southern India [12].Urinary tract infection [19, 13]. According to a study carried out in Liverpool, the United Kingdom, and retrospective research in India, which recruited 154 cases and 334 as a control groups, 28.41% of the participants in case groups had anemia, and a case-control study conducted in southern India found 2.0% cases and 2.0% controls. Anemia was seen among 64.2% of full-term newborns and 73.5% of preterm infants [21,1,12,4]. Two comparable studies in India discovered that mothers who had preterm babies complained of anemia during pregnancy [22,12]. A case-control study conducted in southern Indian revealed that the mothers who gave birth prematurely complained of PROM [21,12].According to the research, mothers had psychological issues during their pregnancies. In contrast, two comparative studies in Indonesia and India found that pregnant stress causes preterm birth. [5,12].A recent investigation demonstrated that mothers infected with COVID-19 during pregnancy had babies born prematurely. Descriptive statistical research indicated that COVID-19-associated mortality increased to 10% of overall deaths, while preterm mortality increased. [23]. A recent investigation demonstrated that mothers infected with COVID-19 during pregnancy had babies born prematurely. Descriptive statistical research indicated that COVID-19-associated mortality increased to 10% of overall deaths, while preterm mortality increased. [24]. The study found that polyhydramnios was a cause of preterm birth. This outcome is comparable to that of a study. [3,21,12]. Polyhydramnios was one of the primary causes of preterm birth.Risk Factors During Prenatal Stage (During Pregnancy).The study found that the place of childbirth, singleton, and types of delivery, were the main risk factors behind prematurity, and revealed a highly significant association with prematurity respectively, and a significant association between premature births and the factors such as place of childbirth, singleton, and type of delivery. The study reported a highly significant association with prematurity regarding hypertension [3,25,26]. Gestational diabetes mellitus [27]. UTIs [19,25]. Vaginal bleeding [13]. Premature rupture of membrane

[25,27]. Placenta previa [5,20].

CONCLUSION

The study concluded that preterm was associated with mothers who had prenatal hypertension, gestational diabetes mellitus, UTIs, anemia, PROM, psychiatric disorders, COVID-19, polyhydramnios and oligohydramnios.

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ETHICAL CONSIDERATION

the study will approve by the ethical committee / college of nursing – Hawler Medical university- Erbil.

CONFLICT OF INTEREST

The authors (s) report no conflict of interests.

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