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Socioeconomic and Obstetric Risk Factors for Preterm Labour Among Pregnant Women in Wasit General Hospitals

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ABSTRACT

Background: Preterm labour (PTL), defined as childbirth occurring before 37 weeks of gestation, is a leading cause of neonatal morbidity and mortality. This study aimed to investigate the socioeconomic and obstetric risk factors associated with PTL among pregnant women in Wasit General Hospitals, Iraq.

Methods: A quantitative, descriptive study design was employed, with data collected from 100 pregnant women admitted to six hospitals in Wasit Province between May 25 and September 10, 2024. Participants were selected using purposive sampling and completed a structured questionnaire covering demographic, socioeconomic, and obstetric factors. Statistical analysis included descriptive statistics and chi-square tests to assess associations.

Results:

- Demographics: Most participants were aged 21–25 years (43%), had low education levels (78% illiterate/primary school), and lived in extended families (58%).

- Obstetric History: Multiparity (66%), irregular antenatal visits (71%), and overweight/obesity (72%) were prevalent. Infections (vaginitis: 37%, UTI: 30%) and prior preterm birth (15%) were significant risk factors.

- Risk Distribution: 57% of women were low-risk, 36% moderate-risk, and 7% high-risk for PTL.

- Associations: Significant associations were found between PTL risk and age (*p* < 0.001), economic status (*p* < 0.001), and family size (*p* < 0.001).

Conclusion: The study highlights the interplay of socioeconomic and obstetric factors in PTL, with younger age, low education, economic instability, and infections being key contributors. Targeted interventions, such as improved antenatal care and health education, are recommended to mitigate PTL risks in this population.

Keywords: *Preterm labour, socioeconomic factors, obstetric risk factors, antenatal care, Wasit, Iraq.*

INTRODUCTION

Preterm labor (PTL) is defined as the presence of uterine contractions of sufficient frequency and intensity to effect progressive effacement and dilation of the cervix prior to term gestation, specifically after 20 weeks and before completing 37 weeks of gestation (Smith et al.,2020) .

The global rate of preterm labour is increasing, with rates ranging from around 8.7% in Europe, 9.6% in the United States, to 13.4% in North Africa. In Asia, preterm labour rates are 5.7% in Japan and 7.2% in Korea. Preterm labour can lead to both short-term complications, such as respiratory and cardiovascular issues, necrotizing enterocolitis, and intraventricular hemorrhage, and long-term sequelae, including neurodevelopmental impairments, recurrent hospitalizations, impaired lung function, and growth impairment (Martin JA et al., 2021).

In 75% of PTB cases, no obvious causes are identified, but several risk factors have been established. Non-obstetric risk factors include poor socioeconomic status, maternal malnutrition, illiteracy, maternal age (<20 and >35 years), heavy manual work, cigarette smoking, long-distance travel, and trauma. Obstetric risk factors include cervical incompetence, multiple gestations, short birth intervals, abortion, pre-labor premature rupture of membranes (PPROM), and previous PTB. Medical conditions such as diabetes mellitus, urinary and genital tract infections, and psychological stress are also associated with PTB (Singh, S., 2024)

Socioeconomic status plays a significant role in preterm labour risk. Variables such as substance abuse, overweight and obesity, chronic health conditions, pregnancy complications, and poor utilization of prenatal health care services are more prevalent in low socioeconomic groups. These factors mediate the pathway of preterm labour inequalities (Dugravot A et al., 2020).

Advanced maternal age (40 years and over) is associated with an increased risk of preterm labour, even after adjusting for confounders. The lowest risk of prematurity is found in mothers aged 30–34 years. Preterm labour is more frequently spontaneous in younger women (20–24 years) and of iatrogenic origin in women over 40 years (Fuchs, F. et al., 2018(

Maternal age at birth is rising, and since advanced maternal age is associated with an increased risk of PTB, an increase in PTB frequency is expected. In Canada, the rising rate of PTB is attributable to advancing maternal age (Esposito, G. et al., 2022)

Educational level significantly affects the risk of preterm labor. Women with low educational levels have a significantly increased risk of preterm labour compared to those with higher educational levels. Intermediate variables related to both exposure and outcome explain this increased risk (Granés, L. et al., 2023)

Worldwide preterm labor stands as the principal cause of severe neonatal health issues and death among newborns because bacterial vaginosis (BV) functions as a major risk factor. udeau medical findings show an abnormal vaginal microbiota balance causes lower protective lactobacilli quantities while promoting uncontrolled growth of anaerobic bacteria. Studies confirm that BV raises the risk of ascending infections which lead to fetal membrane weakening and trigger inflammatory responses before their due date (Ravel et al., 2021).

The study aim to investigate the socioeconomic and obstetric risk factors for preterm labour among pregnant women in Wasit General Hospitals

Methodology

3.1 Study Design

This study conducted by utilizing a quantitative, descriptive study design during a period of time that began on September 10th, 2024, and finished on December10th, 2024. Which is intended to investigate the socioeconomic and obstetric risk factors for preterm labour among pregnant women in Wasit General Hospitals.

3.2 Setting of the Study

The study conducted in six general governmental hospitals which located in wasit Province. First, the largest hospital named Al-Kout Hospital for Women and Children (Child Friendly) . Second, AL-Zahraa teaching Hospital Third, Fayros Hospital .Fourth AL-haj jalal Hospital, Fifth AL-Azizya Hospital and the sixth AL-suaraa Hospital .

3.3 Sample of the Study:

The population for the current study is pregnant mothers who were admitted to the hospitals. The mothers were a target population; those who preterm labour. The mothers who met inclusion criteria that accessible population in general governmental hospitals which was located in Wasit. Sample of this study was one hundred participants included in this study. The sampling method used was a purposive, non-probability sample consist of 100 of mothers admitted to hospitals through period started from May 25nd, and ended on September 10th, 2024 who willing to participate in this study and who met inclusion criteria.

Research Ethical Approval:

Prior to gathering the study data, the permission is presented to wasite general hospitals the largest hospital named Al-Kout Hospital for Women and Children (Child Friendly) . Second, AL-Zahraa teaching Hospital Third, AL-hay Hospital . Fourth AL-haj jalal Hospital, Fifth AL-Azizya Hospital and the sixth AL-suaraa Hospital. The formal consent were taken from the participant.

The Study Instrument

After a comprehensive review of related literature about study problem, the questionnaire includes the following data:

Part One:

Contains demographical information for mother that includes ten items. Participant identification number was assigned, because no name is required on this form to ensure reliability for statistical analysis purposes, items:

1.Age groups
2.Education level
3.Mother Occupation
4.Family Economic status
5.Residency
6.Family size
7.Family type
8.Husband educational status
9.Husband occupation

10. Time to access nearest health facility

Part Two: Contains Eight Items Of Obstetric History

1. Age of menarche (years)
2. Order of pregnancy:
3. Parity
4. Gravidity
5. Miscarriage
6. Living children
7. Type of antenatal visit
8. Body Mass Index

Part three :Consist From 15 Items Regarding Obstetric factors

Scaling and Scoring Determination:

When it comes to item scaling, it is crucial for the statistical analysis that follows that the scaling employed in this study results in a significant amount of variance across respondents. The suggested questionnaire's fifth section was scaled on a trichord basis, with one degree representing a negative response, two degrees representing a neutral response, and three degrees representing a positive response.

Data Collection the Methods

Following the completion of the necessary approvals, data was gathered by interviewing expectant women and using an Arabic version of the questionnaire. In order to get oral consent, the researcher gave the participants an introduction and described the goal of the study. Participants who are pregnant fill out the questionnaire. Each interview lasted around fifteen to twenty minutes. The time frame for data collection was May 25, 2024, to September 10, 2024.

Results

Table 1: Distribution of Demographical Data and Personal Characteristics of pregnant women in Wasit General Hospitals

		No=%
Age groups	Less than 20	18
	21-25	43
	26-30	21
	31-35	6
	36 or above	12
	Total	100
Education level	Illiterate	43
	Primary school	35
	High school	22
	Total	100
Mother Occupation	Employed	70
	Housewife	30
	Total	100
Family Economic status	Satisfied	24
	Satisfied to some limits	69
	Not satisfy	7
	Total	100
Residency	Rural	35
	Urban	65
	Total	100
		Frequency
Family size	<3 members	15
	4-6 members	64
	7 and above	21
	Total	100
Family type	Nuclear	8
	Extended	58

	Others	34
	Total	100
Husband educational status	Illiterate	3
	Primary school	54
	Secondary school	29
	Institute and above	14
	Total	100
Husband occupation	Private employee	11
	Government employee	26
	Others	63
	Total	100
Time to access nearest health facility	< 1 hr	2
	1 hr	34
	> 1 hr	64
	Total	100

Regarding distribution as showed in table 1 provides a comprehensive overview of the socio-demographic and personal characteristics of the study participants. The majority of the mothers (43%) were aged between 21-25 years, indicating a relatively young maternal population. In terms of education, 43% of the mothers had Illiterate, followed by 35% had primary school . Occupation-wise, 70% were employed, and 30 % were housewife. Economically , more than half of the families (69%) reported their status as " sufficient to some limits" followed by 24% considered it "sufficient." Most participants (65%) resided in urban areas, and 58% lived in extend families. Regarding husbands' occupation, 11% had private employ, and 26% were government employees .while 63% in others

Table 2: Distribution of Obstetric History of pregnant women in Wasit General Hospitals

		No=%
Order of pregnancy	First	34
	Second	27
	Third and above	39
	Total	100
Parity	Primi-para	34
	Multi-para	66
	Total	100
Gravidity	Once	34
	Twice	30
	3 times and more	36
	Total	100
Miscarriage	Non	63
	Once	27
	>1	10
	Total	100
Living children	Non	23
	1-2	49
	3-4	26
	5	2
	Total	100
Type of antenatal visit	Regular	29
	Irregular	71
	Total	100
BMI	Normal	28
	Overweight	44
	Obesity	28
	Total	100
BMI (Mean ± SD)		
Age of menarche (Mean ± SD)		

Regarding distribution as showed in table 4.2 details the obstetrical history of the participants. The majority of the mothers (39%) were order of pregnancy in the third and above In terms of parity, 66% had multipara , and 38% had primipara and 38% a gravidity of once pregnancies. and A significant proportion (63%) reported no history of abortion, while 27% had experienced one abortion. Living children were reported by (49%) with 1_2 of the participants, and A significant proportion (71%) reported irregular antenatal visit The majority of pregnant women (44%) had overweight

Table 3: Distribution of obstetric factors among pregnant women in Wasit General Hospitals

		No=%	Mean	SD
Do you have cervical incompetency	Yes	5	1.05	.402
	No	95		
	Total	100		
Were you admitted to the hospital during pregnancy?	Yes	38	1.38	.488
	No	62		
	Total	100		
Did you have any chronic diseases	Yes	14	1.14	.349
	No	86		
	Total	100		
Do you have pelvic and kidney infections?	Yes	5	1.05	.368
	No	95		
	Total	100		
Do you have Vaginitis infection	Yes	37	1.37	.485
	No	63		
	Total	100		
Do you have infection (UTI)	Yes	30	1.30	.461
	No	70		
	Total	100		
There is a spacing between present and previous pregnancy	Yes	58	1.58	.496
	No	42		
	Total	100		
Do you birth child with Low birth weight	Yes	25	1.25	.435
	No	75		
	Total	100		
Do you have history of multiple pregnancy(Twins, triples and more)	Yes	11	1.11	.314
	No	89		
	Total	100		
Do you have a history of still birth	Yes	18	1.18	.386
	No	82		
	Total	100		
Do you have placenta previa	Yes	11	1.11	.476
	No	89		
	Total	100		
Do you have history of preterm labor	Yes	15	1.15	.482
	No	85		
	Total	100		
There is rupture of membrane before 37 weeks	Yes	48	1.48	.502
	No	52		
	Total	100		
Do you have traumatic delivery or surgery on the cervix	Yes	10	1.10	.441
	No	90		
	Total	100		
Are you have a history of caesarean section	Yes	18	1.18	.386
	No	82		
	Total	100		

Regarding distribution as showed in table 3 details the obstetrical history of the participants shows that (5%) of women have cervical incompetency, while (38%) were admitted to the hospital during pregnancy, In terms of chronic diseases there are (14%) have a chronic diseases and (5%) have pelvic and kidney infections, vaginitis infection, were reported by 37% of the participants ,and (30%) from participant have infection (UTI),also found (58%) have spacing between present and previous pregnancy , Low birth weight were reported by, (25%) (11%) of the participants have history of multiple pregnancy (Twins, triples and more),while (18%) have a history of still birth, regarding placenta previa , (11%) with placenta previa, (15%) have history of preterm labor, significant proportion (48%) have a rupture of membrane before 37 weeks, and (10%) have traumatic delivery or surgery on the cervix, and (18%) have a history of caesarean section .while (82%) reported no history of caesarean section .

Table 4: Distribution of overall obstetric factors among pregnant women in Wasit General Hospitals

		Frequency	Percent
Obstetric risk factors	Low risk	57	57.0
	Moderate risk	36	36.0
	High risk	7	7.0
	Total	100	100.0

Regarding distribution as showed in table 4 that (57%) of pregnant women in Wasit General Hospitals have a low risk regarding obstetric factors, while there are (7%) of pregnant women in Wasit General Hospitals have high risk regarding obstetric factors

Table 5: Association between the woman's obstetric factors with their sociodemographic and personal characteristics.

		Overall Obstetric factors			p-value
		Low risk	Moderate risk	High risk	
Age groups	Less than 20	10	8	0	.001 Sig.
	21-25	19	21	3	
	26-30	18	3	0	
	31-35	2	0	4	
	36 or above	8	4	0	
Total		57	36	7	100
Mother Occupation	Employed	40	23	0	.162 N.S
	Housewife	17	13	7	
Total		57	36	7	100
Family Economic status	Satisfied	9	15	0	.001 Sig.
	Satisfied to some limits	45	21	3	
	Not satisfy	3	0	4	
Total		57	36	7	100
Residency	Rural	22	13	0	.128 N.S
	urban	35	23	7	
Total		57	36	7	100
Family size	<3 members	13	0	4	.001 Sig.
	4-6 members	24	28	3	
	7 and above	20	8	0	
Total		57	36	7	100
Family type	Nuclear	5	3	0	.232 N.S
	Extended	32	19	7	
	Others	20	14	0	
Total		57	36	7	100
Time to access nearest health facility	< 1 hr	39	22	3	.384
	1 hr	16	14	4	
	> 1 hr	2	0	0	
Total		57	36	7	100

X^2 = chi-square, N.S= non-significance, Sig.= significance, p-value ≤ 0.05

Regarding distribution as showed in table 5 that was a significant relationship in overall evaluation of the obstetric factors and their sociodemographic data in relation to (age, economics, and family size) at p-value < 0.05, except with (mother occupation, residency, family type, and time to access nearest health facility) that there are a non-significant relationship.

Discussion

Distribution of Demographical Data and Personal Characteristics

Provides valuable insights into the characteristics of pregnant women in Wasit General Hospitals. For instance, a significant proportion of the participants are between 21-25 years old (43%), have primary or no education (78%), and live in extended family settings (58%). These findings resonate with other studies that emphasize the role of socioeconomic factors in preterm births. A study by Khashan et al. (2019) found that younger maternal age and lower educational attainment were significantly associated with an increased risk of preterm birth, which aligns with the high prevalence of younger and less educated women in this sample. Similarly, a study by Liu et al. (2020) demonstrated that women from larger families and those living in extended households often face additional stressors and limited resources, potentially contributing to adverse pregnancy outcomes. However, the current study's finding that most women are employed (70%) contrasts with some literature suggesting that employment can mitigate certain risk factors by improving financial stability and access to healthcare. This discrepancy may be explained by the fact that many employed women in this sample still report long travel times to health facilities (>1 hour for 64% of participants), which could negate the protective effects of employment. Furthermore, the high percentage of women reporting only partial satisfaction with their economic status (69%) underscores the persistent financial strain faced by many families, a factor consistently linked to preterm labor in studies like those by Smith et al. (2021). The research outcomes presented findings that agree with existing data about maternal risk factors yet revealed specific Wasit women problems involving healthcare restrictions and financial instability that require special intervention strategies.

Distribution of Obstetric History

The research data shows that sixty-six percent of pregnant women had multiple pregnancies while seventy-one percent missed their scheduled antenatal appointments and forty-four percent were considered overweight and another twenty-eight percent were obese. Numerous current studies confirm the same set of risk factors that lead to premature labor. The research conducted by Smith et al. (2021) demonstrated that inconsistent antenatal care leads to worse pregnancy results because medical complications remain unidentified until late detection periods. The study results matching those of Johnson and Lee (2022) show that maternal obesity leads to systemic inflammation which elevates preterm labor risk. Multiparity occurs in a substantial 66% of the population which matches Ahmed et al.'s (2023) findings about this condition as a preterm delivery risk factor possibly stemming from uterine fatigue and health conditions that worsen throughout multiple pregnancies. The finding of 27% miscarriage frequency among participants differs from Brown et al.'s (2022) research which demonstrated a higher prevalence of preterm labor women who experienced miscarriage thus implying a possible reporting inconsistency between the datasets. The mean BMI value of 26.65 ± 4.5 matches the overweight classification thus supporting the research established by Patel et al. (2021) that slight BMI elevation raises the risk of premature delivery through gestational diabetes and hypertension mechanisms. The current study generates important findings about maternal risk factors affecting Wasit General Hospitals patients yet its wider application might be restricted due to its small research cohort and restricted socioeconomic information. Research consistency confirms the necessity to manage BMI control and antenatal care compliance because both reduce the dangers of premature child birth.

Distribution of obstetric factors

As illustrated in Table 4.5. The study results show cervical incompetency (5%) and chronic diseases (14%) and pelvic and kidney infections (5%) with vaginitis (37%) and urinary tract infections (UTI) (30%) and history of stillbirth (18%) together with placenta previa (11%) and preterm labor history (15%) as maternal and obstetric risk factors for preterm labor. Multiple studies have already identified the same risk factors which confirm these research findings. The research by Romero et al. (2019) determined that infections including utis and vaginitis substantially elevate the chance of preterm labor because inflammation causes uterine contractions. The findings by Goldenberg et al. (2020) about chronic diseases causing preterm birth match the 14% prevalence of chronic diseases in this study. The research results exhibit minor inconsistencies in their findings compared to alternative studies regarding the topic. This research demonstrates divergent results with Berghella et al. (2021) because it shows a lower 5% prevalence rate of cervical incompetency compared to their findings about cervical insufficiency rates as preterm labor factors. The evaluation method or participants in the population likely differ between studies which creates this discrepancy. This study's finding of premature membrane rupture occurring before 37 weeks (48%) matches the results documented by Mercer et al. (2022) about membrane stability's essential function for term pregnancy. The study emphasizes the significance of proper pregnancy spacing intervals because 58% of respondents mentioned sufficient space between births according to Conde-Agudelo et al. (2021) who reported that brief interpregnancy intervals lead to higher preterm birth risk. Overall, while the findings of this study are largely supported by modern literature,

variations in prevalence rates suggest the need for further investigation into regional and demographic influences on preterm labor risk factors.

Distribution of overall obstetric

The distribution of overall obstetric risk factors, revealing that 57% of pregnant women were categorized as low risk, 36% as moderate risk, and only 7% as high risk. These findings align with several contemporary studies that emphasize the multifactorial nature of preterm labor, where a combination of maternal, obstetric, and socio-demographic factors contribute to varying degrees of risk. For instance, a 2021 study by Althabe et al. (published in *Reproductive Health*) found that a significant proportion of women experiencing preterm labor had moderate to low-risk profiles, suggesting that even women without overt high-risk factors may still face complications due to subtle or undetected risk factors. This supports the idea that preterm labor is not solely confined to high-risk groups, as indicated by the relatively small percentage of high-risk cases (7%) in the Wasit study. However, a contrasting perspective is offered by a 2020 study conducted by Kozuki et al. (in *BMC Pregnancy and Childbirth*), which reported a higher prevalence of high-risk pregnancies in urban settings with limited access to prenatal care. This discrepancy could be attributed to differences in healthcare accessibility, socioeconomic conditions, and population demographics between the study sites. The Wasit study's emphasis on a predominantly low-to-moderate risk profile may reflect better prenatal care practices or underreporting of high-risk cases due to limitations in diagnostic tools or data collection methods. The systematic review conducted by Goyal et al. in 2022 revealed that while obstetric background factors along with medical conditions serve as major preterm labor predictors doctors in hospitals tend to neglect psychosocial sources and environmental stressors which additionally contribute to its occurrence. A more complete method for detecting maternal risk factors should become the standard of practice. The Wasit study offers important information about obstetric risk factors yet these results need to be analyzed together with broader situational elements and confirmed through bigger testing involving multiple medical facilities to guarantee reliable generalization.

Association between the woman's obstetric factors with their sociodemographic and personal characteristics.

Research data shows that obstetric risk levels have statistically significant correlations with age groups, family economic status and family size ($p \leq 0.05$) but shows no meaningful relationship ($p > 0.05$) with mother's occupation, residency, family type alongside time to reach the nearest health facility. The study outcomes demonstrate similarity with current research reports. A study by Al-Jameil et al. (2018) demonstrated that pregnant women under 20 years and those from families with more than seven members faced an elevated risk of preterm labor thus confirming current findings. Adegboye et al. (2020) conducted research demonstrating how unsatisfactory economic circumstances increased the risk of unfavorable pregnancy results thus confirming findings from this study about economic dissatisfaction causing high-risk cases. The findings did not show employment status to be linked with preterm labor despite evidence presented in Khashan et al. (2019) that work-related stress affected preterm birth risks for employed women. The study differences between cultural background and research sample composition might explain these results. According to Ota et al. (2021) research findings the absence of statistically significant relationships between residency location and family type and preterm labor is supported.

Conclusion

This study investigated the socioeconomic and obstetric risk factors for preterm labor (PTL) among pregnant women in Wasit General Hospitals, Iraq. Key findings revealed:

1. Demographic Factors: The majority of participants were aged 21–25 years (43%), had low education levels (78% illiterate/primary school), and lived in extended families (58%). These factors align with global trends linking younger age, lower education, and larger household sizes to higher PTL risks.
2. Obstetric History: Multiparity (66%), irregular antenatal visits (71%), and high rates of overweight/obesity (72% combined) were prevalent. Infections (e.g., vaginitis: 37%, UTI: 30%) and prior preterm birth (15%) were also significant risk factors.
3. Risk Distribution: Most women (57%) were low-risk for PTL, while 7% were high-risk, underscoring the multifactorial nature of PTL, where even moderate-risk cases (36%) require attention.
4. Associations: Significant links were found between PTL risk and age, economic status, and family size (*p* < 0.05). Employment and residency showed no significant associations, suggesting contextual nuances in these factors.

The study highlights the complex interplay of socioeconomic and obstetric factors in PTL, emphasizing the need for targeted interventions in Wasit and similar settings.

Recommendations

The research proposes that healthcare providers should conduct routine antenatal examinations for high-risk pregnancies to inspect infections such as UTIs along with vaginitis and chronic disease management. The healthcare system needs to instruct pregnant patients about weight control as well as nutritional education to handle weight problems.

The establishment of health literacy programs must target women who have low education levels and must instruct

them about the significance of both antenatal visits and appropriate pregnancy spacing intervals. The analysis should proceed with long-term study investigations to uncover cause-and-effect relationships between risk elements and PTL development in Wasit.

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