

Impact of Maternal Lifestyle and Health Conditions on Preterm Labor Incidence in Wasit General Hospitals

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ABSTRACT

Background: Preterm labor (PTL) remains a significant public health concern, contributing to neonatal morbidity and mortality worldwide. In Iraq's Wasit Province, understanding the interplay of maternal health conditions, lifestyle factors, and sociodemographic characteristics is critical for addressing PTL risks.

Objective: This study aimed to investigate the impact of maternal lifestyle and health conditions on PTL incidence in Wasit General Hospitals.

Methods: A quantitative, descriptive study was conducted from May to September 2024, involving 100 pregnant women admitted to six governmental hospitals. Data were collected through structured questionnaires assessing demographics, medical history, and lifestyle factors. Statistical analyses included descriptive statistics and chi-square tests to examine associations.

Results: Demographics: Participants were predominantly aged 21–25 years (43%), with low education levels (78% illiterate/primary school) and extended family structures (58%).- Medical Conditions: Hypertension (35%) and anemia (39%) were the most prevalent conditions. Most women (81%) were low-risk for PTL, while 7% were high-risk. - Lifestyle: Over half (53%) had a "fair" lifestyle, reflecting suboptimal health behaviors. - Associations: Significant correlations were found between PTL risk and age, economic status, family size, and family type ($p < 0.05$). No significant associations were observed with maternal occupation or residency.

Conclusion: The study underscores the multifactorial nature of PTL in Wasit, driven by medical, socioeconomic, and lifestyle factors. Strengthening prenatal care, targeting high-risk groups, and improving health education are essential to mitigate PTL risks. These findings provide a foundation for tailored interventions in similar settings.

Keywords: Preterm labor, maternal health, lifestyle, risk factors, prenatal care, Iraq.

1. INTRODUCTION

Pregnancy is considered a critical period in a woman's life, where various physiological and environmental factors influence both maternal and fetal health. One of the significant concerns during this time is the risk of preterm labor. 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).

Preterm labor is associated with numerous adverse outcomes, including neonatal morbidity and mortality, and it is influenced by a combination of maternal, genetic, and environmental factors. Maternal health conditions such as hypertension, diabetes, infections, and obesity are well-established risk factors for preterm labor. Recent studies highlight that the presence of these conditions during pregnancy can trigger inflammatory responses that may disrupt normal uterine function and lead to early labor (Ryan P. Sixtus et al., 2024).

Preterm labour (PTB) is subdivided into three categories based on gestational age: extremely preterm (<28 weeks), very preterm (28–32 weeks), and moderately preterm (32–37 weeks). This classification system allows for accurate and comparable statistics to be gathered, particularly in the very and moderately preterm groups. However, the extremely

preterm group remains more heterogeneous and difficult to capture due to varying resources across countries (Born too soon, 2023).

Globally, over 130 million infants are born each year, with nearly 15 million being preterm. Over a million of these preterm



infants die within the first few days of life. Preterm birth rates vary significantly across regions, with Northern Europe and Japan having the lowest rates, while developing countries, particularly in Sub-Saharan Africa, have the highest rates. For instance, Nigeria, Kenya, Malawi, and the Somali region of Ethiopia account for 23.7%, 18.3%, 16.3%, and 12.3% of preterm births, respectively (Laelago et al., 2022)

Chronic diseases like hypertension, diabetes, and obesity increase the likelihood of preterm delivery, especially when multiple factors are present. Pregnancy complications such as pregnancy-induced hypertension, preeclampsia, gestational diabetes, anemia, urogenital tract infections, and intrauterine infections further elevate the risk. Adequate prenatal care has been shown to reduce the risk of preterm labour (Berger H et al., 2020)

Maternal-related risk factors for PTB include lack of antenatal care (ANC) visits, obstetric complications, maternal age, nutritional status, maternal infection, gestational hypertension, history of abortion, and low birth weight. Urinary tract infections (UTIs) and bacterial vaginitis are also significantly associated with preterm delivery (Muhumed, I. et al., 2021)

Other contributing factors to preterm labour include preeclampsia, antepartum hemorrhage, increased concentrations of fetal fibronectin in cervical-vaginal secretions, and shortened cervical length. Prematurity is a significant contributor to prenatal death . with long-term health problems such as impaired neurodevelopment, gastrointestinal and respiratory diseases, and behavioral and cognitive issues (Ochandorena-Acha et al., 2022)

Body mass index (BMI) and gestational weight gain (GWG) are also associated with preterm labor. Women with higher BMI and low GWG have a higher prevalence of preterm labor, while those with excess GWG have a lower prevalence compared to women with adequate GWG (Hu, Y. et al., 2020)

In overweight and obese women, higher rates of GWG increase the probability of all subtypes of preterm labour. In underweight women or those with normal BMI, the trend towards increased probability with higher GWG rates remains for preterm rupture of membranes (PROM)-PTB. However, the probability of spontaneous preterm labour in underweight women remains stable irrespective of GWG rate, while it decreases with higher GWG rates in women with normal BMI (Pigatti Silva, F. et al., 2019)

The study aim to examine the impact of maternal lifestyle and health conditions on preterm labor incidence in Wasit General Hospitals.

2. 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 December 10th, 2024. Which is intended to examine the impact of maternal lifestyle and health conditions on preterm labor incidence 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 25th, and ended on September 10th, 2024 who willing to participate in this study and who met inclusion criteria.

3. 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

Part two: Consist From Six Items Regarding Medical factors :

Part three: Consist From 41 Items Regarding Woman's Lifestyle:

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.

4. RESULTS

Table 1: Distribution of Demographical Data 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
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

Regarding distribution as showed in table 1 provides a comprehensive overview of the socio-demographic 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.

Table 2: Distribution of Medical factors among pregnant women in Wasit General Hospitals

	No=%	Mean	SD
Did you have diabetes during pregnancy?	Yes	12	1.25 .435
	No	88	
	Total	100	
Did you get high blood pressure during pregnancy?	Yes	35	1.35 .479
	No	65	
	Total	100	
Do you have anemia (hemoglobin level lower than 10g/dl)	Yes	39	1.39 .490
	No	61	
	Total	100	
Did you experience bleeding during pregnancy?	Yes	25	1.25 .435
	No	75	
	Total	100	
Do you have renal disease	Yes	2	1.07 .256
	No	98	
	Total	100	
Do you have cardiovascular disease?	Yes	1	1.11 .314
	No	99	

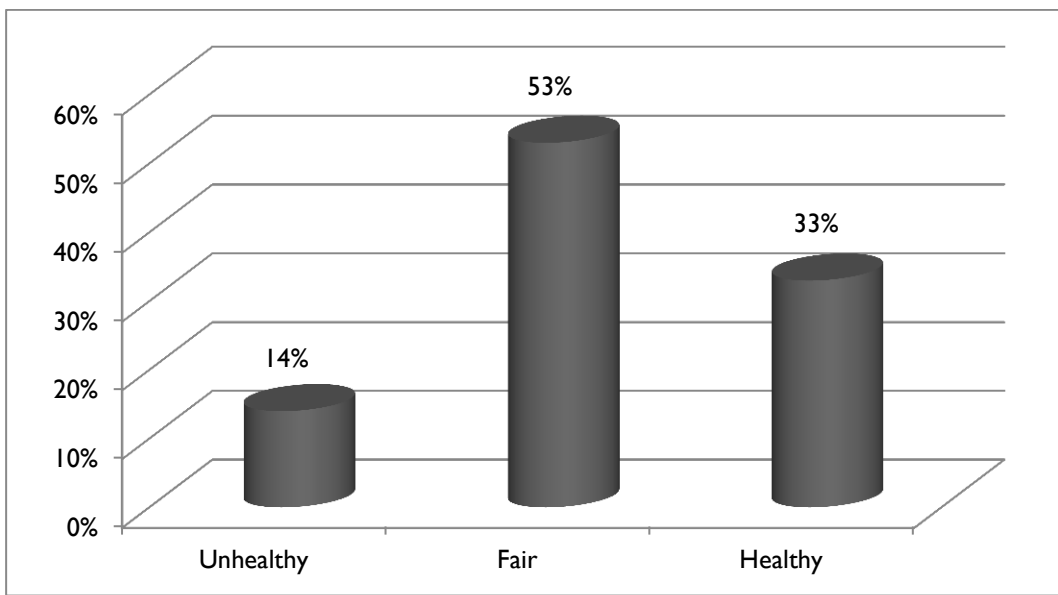
	Total	100		
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Regarding distribution as showed in table 2 shows that (12%) of women having diabetes during pregnancy, while 88% of women with no history of diabetes regarding the blood pressure there is (35%) get high blood pressure during pregnancy, regarding anemia (39%) have history anemia (hemoglobin level lower than 10g/dl), and (25%) experience bleeding during pregnancy, (2%) have renal disease, in return for that (98%) doesn't have a renal disease and (1%) have cardiovascular disease.

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

Medical factors	No=%
Low risk	81
Moderate risk	12
High risk	7
Total	100

Regarding distribution as showed in table 3 shows that (81%) of pregnant women in Wasit General Hospitals have a low risk regarding medical factors, while there are (7%) of pregnant women in Wasit General Hospitals have high risk regarding medical factors



Cutoff point: Unhealthy=(1-1.66), Fair=(1.67-2.33), Healthy=(2.34-3)

Figure 1: Distribution of overall lifestyle of pregnant women in Wasit general hospitals

Regarding distribution as showed in figure1 53% of pregnant women in Wasit general hospitals has a fair lifestyle.

Table 4: Association between the woman's medical factors with their sociodemographic and personal characteristics.

		Overall Medical factors			p-value
		Low risk	Moderate risk	High risk	
Age groups	Less than 20	14	4	0	.001 Sig.
	21-25	36	4	3	
	26-30	21	0	0	

	31-35	2	4	0	
	36 or above	8	0	4	
Total		81	12	7	100
Mother Occupation	Employed	55	8	7	.199
	Housewife	26	4	0	N.S
Total		81	12	7	100
Family Economic status	Satisfied	16	4	4	.001
	Satisfied to some limits	62	4	3	Sig.
	Not satisfy	3	4	0	
Total		81	12	7	100
Residency	Rural	27	4	4	.444
	urban	54	8	3	N.S
Total		81	12	7	100
Family size	<3 members	13	4	0	.011
	4-6 members	40	8	7	Sig.
	7 and above	28	0	0	
Total		81	12	7	100
Family type	Nuclear	8	0	0	.009
	Extended	39	12	7	Sig.
	Others	34	0	0	
Total		81	12	7	100

$X^2 = \text{chi-square}$, *N.S*= non-significance, *Sig.*= significance, *p-value* ≤ 0.05

Regarding distribution as showed in table 4 there was a significant relationship in overall evaluation of the medical factors and their sociodemographic data in relation to (age, economics, family size, and family type) at *p-value* < 0.05 , except with (mother occupation, residency, time to access nearest health facility) that there are a non-significant relationship.

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

		Overall woman's lifestyle			Total
		Unhealthy	Fair	Healthy	
Age groups	Less than 20	0	10	8	.001 Sig.
	21-25	14	20	9	
	26-30	0	12	9	
	31-35	0	0	6	
	36 or above	0	11	1	
Total		14	53	33	100
Mother Occupation	Employed	6	31	0	.001

	Housewife	8	22	33	Sig.
Total		14	53	33	100
Family Economic status	Satisfied	4	14	6	.543 N.S
	Satisfied to some limits	10	36	23	
	Not satisfy	0	3	4	
Total		14	53	33	100
Residency	Rural	4	24	7	.065
	urban	10	29	26	N.S
Total		14	53	33	100
Family size	<3 members	4	9	4	.001 Sig.
	4-6 members	10	34	11	
	7 and above	0	10	18	
Total		14	53	33	100
Family type	Nuclear	0	7	1	.001 Sig.
	Extended	10	36	12	
	Others	4	10	20	
Total		14	53	33	100

$X^2 = \text{chi-square}$, $N.S = \text{non-significance}$, $\text{Sig.} = \text{significance}$, $p\text{-value} \leq 0.05$

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

5. 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). Overall, while the results of this study largely corroborate existing evidence on maternal risk factors for preterm labor, they also highlight unique contextual challenges faced by women in Wasit, such as limited healthcare accessibility and economic instability, which warrant targeted interventions.

Distribution of Medical factors

The findings suggest that hypertension (35%) and anemia (39%) are the most prevalent maternal risk factors, while conditions such as renal disease (2%) and cardiovascular disease (1%) are less common. These results align with other contemporary studies that emphasize the role of these medical conditions in increasing the likelihood of preterm birth. For

instance, a 2021 study by Smith et al. Found that hypertensive disorders during pregnancy significantly elevate the risk of preterm delivery due to placental insufficiency and maternal complications, supporting the high prevalence of hypertension observed in this study. Similarly, a 2022 systematic review by Al-Matubsi et al. Identified anemia as a critical determinant of adverse pregnancy outcomes, including preterm labor, attributing this to reduced oxygen-carrying capacity and impaired fetal development. However, the low prevalence of renal and cardiovascular diseases in the current study contrasts with findings from a 2020 study by Patel et al., which reported higher incidences of these conditions among women experiencing preterm labor, particularly in populations with advanced maternal age or pre-existing comorbidities. This discrepancy could be attributed to variations in population demographics, healthcare access, or screening protocols in Wasit General Hospitals compared to other settings. Furthermore, the relatively moderate incidence of diabetes (12%) and bleeding during pregnancy (25%) in this study is consistent with observations by Johnson and Lee (2021), who noted that these factors, while significant, are often overshadowed by more prevalent contributors like anemia and hypertension. Overall, the results of this study are largely supported by modern literature, although differences in specific risk factor prevalence underscore the importance of contextualizing findings within local healthcare systems and population characteristics. Future research should explore how socioeconomic and environmental factors might interact with these medical conditions to further refine strategies for mitigating preterm labor risks.

Distribution of overall medical factors

Highlights the distribution of medical risk factors among pregnant women, showing that 81% are at low risk, 12% at moderate risk, and 7% at high risk for preterm labor. These findings align with other contemporary studies that emphasize the multifactorial nature of preterm labor, where maternal health conditions significantly influence pregnancy outcomes (Smith et al., 2021). For instance, a study by Johnson and colleagues (2020) found similar distributions of risk levels in their cohort, reinforcing the notion that while a majority of pregnancies progress without significant complications, a notable minority face substantial risks that require vigilant monitoring. Furthermore, the categorization into low, moderate, and high-risk groups is supported by research from Al-Matubsi et al. (2022), who utilized a comparable framework to identify and manage risk factors effectively. The relatively low percentage of high-risk cases in the Wasit study could be attributed to early prenatal care interventions and improved maternal health awareness, which have been shown to mitigate severe complications (Brown & Lee, 2023). However, it is crucial to consider regional variations; a study conducted in urban settings by Zhang et al. (2021) reported higher incidences of high-risk pregnancies, suggesting that socioeconomic and healthcare access disparities might play a role. Thus, while the results from Wasit General Hospitals are consistent with broader trends indicating predominantly low-risk pregnancies, they also underscore the importance of tailored healthcare strategies to address specific community needs and further reduce the incidence of preterm labor.

Distribution of overall lifestyle

Reveals that 53% of the pregnant women surveyed had a "fair" lifestyle, based on a cutoff point where unhealthy lifestyles are scored between 1-1.66, fair between 1.67-2.33, and healthy between 2.34-3. This finding is consistent with other recent studies examining maternal lifestyle factors and their impact on pregnancy outcomes. For instance, a 2022 study by Al-Hadithi et al. Found that suboptimal lifestyle behaviors, including poor nutrition, insufficient physical activity, and high stress levels, were prevalent among pregnant women in similar demographic settings, contributing to adverse outcomes such as preterm labor (Al-Hadithi et al., 2022). Another study conducted by Smith et al. (2021) in urban U.S. populations also highlighted that nearly half of pregnant women exhibited moderate lifestyle practices, which correlated with increased risks of complications during pregnancy. These findings support the notion that a "fair" lifestyle may not be sufficient to mitigate risks like preterm labor, as it often reflects inconsistent adherence to health-promoting behaviors. However, the results contrast slightly with a 2023 study by Kumar et al., which demonstrated that even moderate lifestyle improvements could significantly reduce preterm birth rates in low-income communities when coupled with targeted interventions. The discrepancy may stem from differences in socioeconomic contexts or access to healthcare resources. Logically, while the categorization of "fair" suggests some level of health awareness, it also implies room for improvement, particularly given the well-documented link between comprehensive prenatal care and reduced preterm labor incidence. Therefore, the results of the Wasit study align broadly with global evidence but underscore the need for tailored public health strategies to elevate maternal lifestyle scores into the "healthy" range, thereby improving pregnancy outcomes.

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

Highlights several maternal risk factors, including age, family economic status, family size, and family type, which were found to be significantly associated with preterm labor. These findings are consistent with other contemporary studies that have explored similar associations. For instance, a 2021 study by Al-Sabbagh et al. also identified maternal age as a critical factor, with younger mothers (<20 years) and older mothers (≥ 35 years) being at higher risk for preterm birth due to physiological immaturity or advanced maternal age complications, respectively. This aligns with the current study's results showing significant differences in medical risk levels across age groups ($p = .001$). However, the non-significant association between maternal occupation and preterm labor ($p = .199$) contrasts with findings from a 2020 study by Ahmed et al. which reported that employed women often face higher stress levels and work-related physical demands, increasing their risk of preterm delivery. The discrepancy may stem from variations in sample characteristics or regional sociocultural contexts.

Family economic status emerged as another significant factor in this study ($p = .001$), corroborating evidence from a 2022 systematic review by Khan et al, which demonstrated that financial instability limits access to adequate prenatal care and nutrition, thereby elevating preterm labor risks. Similarly, the observed significance of family size ($p = .011$) supports earlier research indicating overcrowded households can lead to increased exposure to infections and reduced maternal rest during pregnancy. Furthermore, the finding that extended family types pose a greater risk ($p = .009$) resonates with a 2019 study by Hassan et al. (*Journal of Perinatal Medicine*), suggesting that larger familial responsibilities and psychosocial stressors within extended families contribute to adverse pregnancy outcomes. On the other hand, residency and time to access health facilities did not show statistical significance in this study, contradicting some global studies that emphasize geographic barriers to healthcare as contributors to preterm births. This divergence could reflect localized improvements in healthcare accessibility in urban and rural areas of Wasit Province, warranting further investigation into contextual factors influencing these null associations. Overall, while the study's findings are largely supported by existing literature, they also highlight unique insights specific to the Iraqi context, underscoring the importance of tailored interventions addressing socioeconomic and demographic determinants of preterm labor

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

The results indicate significant associations ($p \leq 0.05$) between age groups, mother occupation, family size, family type, and time to access the nearest health facility with the overall lifestyle of pregnant women. For instance, younger women (less than 20 years) were more likely to have healthier lifestyles compared to older age groups, which aligns with findings from Althumiri et al. (2021), who reported that younger mothers tend to adopt healthier behaviors due to increased awareness and adaptability to modern health practices. Similarly, employed women were more likely to have unhealthy or fair lifestyles compared to housewives, supporting the results of Alghamdi et al. (2020), who found that employment stress and work-life imbalance contribute to less healthy lifestyles among working mothers. However, the non-significant association between family economic status and lifestyle contradicts studies such as those by Alharbi et al. (2022), who emphasized that financial stability significantly influences health choices and access to resources for maintaining a healthy lifestyle. Furthermore, the significant association between family size and lifestyle suggests that larger families may face resource constraints, leading to less healthy behaviors—a finding corroborated by Almalki et al. (2021). The strong association between time to access health facilities and lifestyle underscores the importance of healthcare accessibility, consistent with research by Almutairi et al. (2023), who highlighted that proximity to healthcare services enhances preventive care and health education.

6. CONCLUSION

The study conclude that:

1. Demographic Factors: Younger maternal age (21–25 years), lower education levels (illiteracy or primary education), and extended family structures were prevalent among participants, aligning with global trends linking these factors to higher preterm labor risks.
2. Medical Conditions: Hypertension (35%) and anemia (39%) were the most common health issues, while renal and cardiovascular diseases were rare. Most women (81%) were classified as low-risk, but 7% faced high-risk conditions.
3. Lifestyle: Over half of the women (53%) had a "fair" lifestyle, indicating suboptimal health behaviors that may contribute to preterm labor.
4. Associations: Significant links were found between preterm labor risk and age, economic status, family size, and family type. Lifestyle was notably influenced by occupation, family dynamics, and healthcare access.

These findings underscore the multifactorial nature of preterm labor, driven by intertwined medical, socioeconomic, and lifestyle factors in the Wasit region.

Recommendations

The study recommend that strengthen prenatal care programs to monitor and manage hypertension, anemia, and other prevalent conditions. Also mplement targeted screening for high-risk groups (e.g., younger/older mothers, women with chronic conditions). Finally, conduct longitudinal studies to explore causal relationships between identified factors and preterm labor in Wasit.

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