SUMMARY

Pregnant mothers' occupational factors linked to pregnancy complications

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AUTHORS' CONTRIBUTION: (A) Study Design · (B) Data Collection. (C) Statistical Analysis · (D) Data Interpretation · (E) Manuscript Preparation · (F) Literature Search · (G) Funds Collection

Woman's occupation can have a profound impact on her pregnancy and the health of her developing fetus. It is crucial to address the multifaceted challenges associated with occupational exposures during pregnancy, including physical demands, hazardous substances, psychosocial stressors, and ergonomic factors. This work aims to investigates the relationship between occupational factors with some certain related characteristics of pregnant women and their association with pregnancy complications in Al-Hilla City, Iraq. Utilizing a quantitative, cross-sectional design, data were collected from 250 pregnant women attending two governmental hospitals between December 2023 and June 2024. The study employed a purpose This work aims to investigates the relationship between occupational factors with some certain related characteristics of pregnant women and their association with pregnancy complications in Al-Hilla City, Iraq sampling method, and data were analyzed using descriptive and inferential statistics with IBM SPSS version 26. Results discovered that strenuous occupational responsibilities which involved long hours of standing or heavy manual tasks and hazardous material contact directly connected to pregnancy difficulties also occupational stress functions as a significant component that leads to pregnancy complications. Based on the study's findings, the study recommended that workplace needs ergonomic modifications which include seating when employees need to stand along with procedures that reduce physical strain from heavy lifting tasks and implementation of flexible work arrangements including remote work options and reduced working hours need to be supported by employers to benefit their pregnant employees.

Keywords: Pregnancy complications; Occupational factors; Sociodemographic factors; Maternal health; Iraq

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INTRODUCTION

Pregnancy is a pivotal period in a woman's life, and maintaining optimal health during this time is crucial for both the mother and the developing fetus. A growing body of evidence suggests that lifestyle factors play a significant role in the workplace needs ergonomic modifications which include seating when employees need to stand along with procedures that reduce physical strain from heavy lifting tasks. Influencing pregnancy outcomes. Unhealthy lifestyle choices, such as poor dietary habits, inadequate physical activity, smoking, and alcohol consumption, have been linked to an increased risk of various pregnancy complications, including gestational diabetes, preeclampsia, preterm birth, and low birth weight. Conversely, adopting healthy lifestyle practices, such as consuming a balanced diet, engaging in regular physical activity, and abstaining from harmful substances, can promote favorable pregnancy outcomes [1].

Pregnancy complications are those problems that arise in the prenatal period and put the lives of the pregnant woman and the fetus at risk. They include hypertensive disorders, gestational diabetes, anemia, and mental illness, among others. Such complications arise when the pregnant woman is exposed to risk factors such as environmental factors, the psychological state of the pregnant woman, the individual's physical health before pregnancy, and the woman's social health. Pregnancy complications such as hypertensive disorders and gestational diabetes put both the mother's and child's live at risk, with potential complications including maternal death, stillbirth, and preterm birth, among other problems. Being free of such complications is the goal of every pregnant woman, as giving birth to a healthy child and returning home in good condition is what every mother hopes for. To help ensure such a result, pregnant women should be made aware of these complications [2].

In ward-wide settings and across the Middle East, including Iraq, the prevalence of pregnancy complications such as gestational diabetes, hypertension, and preterm birth are influenced by modifiable lifestyle factors, including diet, physical activity, and stress levels. Addressing these factors through targeted interventions can significantly reduce the burden of complications, improve maternal health, and enhance neonatal outcomes. Recent studies highlight that lifestyle modifications during pregnancy, such as improved nutrition and reduced sedentary behavior, are associated with lower rates of complications, particularly in regions like Iraq where healthcare resources are limited and cultural practices may impact maternal health behaviors [3]. This underscores the importance of integrating lifestyle education into prenatal care to empower pregnant mothers and reduce the incidence of preventable complications. This work aims to investigates the relationship between occupational factors with some

certain related characteristics of pregnant women and their association with pregnancy complications in Al-Hilla City, Iraq.

METHODOLOGY

This study is conducted by utilizing a quantitative, Cross-sectional design during a period of time that began on December 10th, 2023, and finished on June 10th, 2024, to assess pregnancy complications among studied sample that are triggered at the present. It is carried out in two governmental hospital which are located in Hilla City. First one, the largest hospital named Babylon Teaching Hospital for Maternity and Children which contains maternity wards, gynecological wards and delivery rooms, second one named AL-Imam AL-Sadiq Teaching Hospital which contain maternity, gynecology and delivery rooms. Target population a convenient sample of (250) women were included in this study was the women who are 20 years old and above who attended to the, maternity ward and delivery rooms of the main teaching hospitals in Hilla City, divided into (150) from Imam AL-Sadiq Teaching Hospital, (100) from Babylon Teaching Hospitals for Maternity and Children, any pregnant mothers who met the research criteria was included in this study. A questionnaire was designed and refined based on a literary research review to implement the study and fulfill all its intended objectives. The study used questionnaires to gather data through which the research collected its information as follow: Part One: Contains demographical information for mother and her husband that includes 10 items. Part two: Includes History of Past or Present Illnesses consist of 6 items. Part Three: Consists of 17 items for pregnancy complications. The

data were statistically analyzed using IBM's SPSS version 26. Both descriptive and inferential statistics were utilized by the researcher at statistical significance {P-value >0.05}.

RESULTS

Tab. 1. provides a comprehensive overview of the socio-demographic and personal characteristics of the study participants. The majority of the mothers (28.2%) were aged between 20-24 years, indicating a relatively young maternal population. In terms of education, 34.9% of the mothers had completed intermediate school, followed by 23.8% had education at the institute level or above? Occupation-wise, 36.5% were government employees, and 34.1% were housewives. Economically, nearly half of the families (48.8%) reported their status as "barely sufficient," followed by 45.2% considered it "sufficient." Most participants (70.2%) resided in urban areas, and 32.5% lived in nuclear families.

Fig. 1. Illustrates the prevalence of past or present illnesses among the participants. Diabetes mellitus was the most common condition, in about 38.1% of the women, hypertension at 29.4%. Multiple pregnancies were reported by 7.9% of the participants, while psychiatric illnesses and genetic abnormalities were less common, at 4.8% and 1.2%, respectively. This figure underscores the significant burden of chronic conditions, particularly diabetes and hypertension, among pregnant women in the study.

Tab. 2. provides insights into the menstrual history of the participants. The majority (60.3%) experienced menarche between the ages of 11-12, and 73% reported

Socio-demographics	Items	Frequency	Percent	
teristics among par- ts.		Less than 20	22	8.70
		20-24	71	28.20
	Mothers Age	25-29	39	15.50
		30-34	64	25.40
		35-39	41	16.30
		40 or above	15	6.0
		Total	252	100.0
		Not read and write	18	7.1
		Read and write	21	8.3
		Primary school graduate	9	3.6
	Mothers Educational Level	Intermediate school graduate	88	34.9
		High school graduate	56	22.2
		Institute and above	60	23.8
		Total	252	100.0
	Occupation	Governmental employee	92	36.5
		Private job	38	15.1
		House wife	86	34.1
		Student	36	14.3
		Total	252	100.0
		Sufficient	114	45.2
		Barely Sufficient	123	48.8
	Family Economic Status	In sufficient	15	6.0
		Total	252	100.0
		Urban	177	70.2
	Residence	Rural	75	29.8
		Total	252	100.0
		Nuclear	82	32.5
	Family Trues	Extended	82	32.5
	гатиу туре	Others	88	34.9
		Total	252	100.0

Tab. 1 data charac ticipan



. 2. Distribution of menstrual	Items		Frequency	Percent	
ory among studied sample.		11-12	152	60.3	
	Age at Menarche	13-14	76	30.2	
		15-16	24	9.5	
		Total	252	100.0	
		Regular	184	73.0	
	Cycles	Irregular	68	27.0	
		Total	252	100.0	
	Duration of Cycles	3-4	84	33.4	
		5-6	116	36	
		7 or more	52	20.6	
		Total	252	100.0	
	Interval of Cycles	21-23	15	6.0	
		24-27	66	26.2	
		28-30	157	62.3	
		More than 30	14	5.6	
		Total	252	100.0	

regular menstrual cycles. The duration of menstrual cycles was most commonly 5-6 days (36%), while 62.3% had cycle intervals of 28-30 days.

Tab hist

Tab. 3. shows the highest mean is 1.89 in the item (Anemia (Iron deficiency anemia, nutritional anemia, folic acid deficiency anemia), while the overall mean was 21.4762.

Tab. 4. shows that (82.9%) of the pregnant mothers who are attending primary healthcare center have mild complications which is positive for maternal and fetal health.

Tab. 5. examines occupational factors affecting pregnant women. The mean scores for various occupational factors ranged from 1.82 to 2.58, with the highest mean score associated with prolonged computer use. Most participants (65.9%) had a fair level of occupational factors, indicating moderate workplace conditions. However, factors such as workplace satisfaction and stress were rated lower, suggesting areas for improvement in workplace policies to better support pregnant employees.

Fig. 2. show that mostly of participants (65.9%) with a fair level of occupational factors.

Tab. 6. show that a significant correlation between

pregnant mothers' occupational factors and pregnancy complications.

DISCUSSION

The socio-demographic data reveals that the majority of the mothers in the study were aged between 20-24 years, which aligns with findings from other studies that indicate a trend of younger maternal populations in developing countries. For instance, a study carried out in Nigeria by Looman, et al. [1] also raveled that a significant proportion of pregnant women were in their early twenties, suggesting that early childbearing is common in these regions. According to research findings 34.9% of mothers finished intermediate school education while 23.8% achieved a level of education at the institute or above. Similar to Spadarella, et al. [4] in India the study discovered that women with higher maternal educational achievements achieve better pregnancy results. A significant number of mothers (23.8%) hold limited educational qualifications suggesting the necessity to develop educational programs that enhance maternal health literacy.

Government employment represented 36.5% of mother participants and housewives comprised 34.1% of the occupational field in the study. A study conducted by

Tab. 3. Distribution of pregnant	Pregnant Mothers Complications		No	Total	Mean
mothers complications.	Hyperemesis gravidarum		54	252	1.79
	Cervical incompetency	11	241	252	1.04
	Bleeding disorders of early pregnancy (abortion)	15	237	252	1.06
	Ectopic pregnancy	28	224	252	1.11
	Hydatidiform mole	6	246	252	1.02
	Bleeding disorders of late pregnancy	11	241	252	1.04
	Placenta Previa	5	247	252	1.02
	Abruption placenta	5	245	250	1.02
	Accrete placenta	8	244	252	1.03
	Hypertension during pregnancy	93	159	252	1.37
	Preeclampsia and Eclampsia		245	252	1.03
	Gestational hypertension		238	252	1.06
	Edema	12	240	252	1.05
	Anemia	225	27	252	1.89
	Infection: viral infection (cytomegalovirus, herpesvirus, hepatitis B, Zika virus infection, STI)	32	220	252	1.13
	Toxoplasmosis	152	100	252	1.60
	UTI	31	221	252	1.12
	Gestational diabetes	30	222	252	1.12
	Antiphospholipid	0	252	252	1.00
	Heart conditions		252	252	1.00
	Depression		247	252	1.01
	Anxiety		246	252	1.02
	Overall mean			24.51	

Tab. 4. Overall pregnancy compli- cations of the pregnant mothers who are attending primary health care center.	Variables		Frequency	Percent	
	Valid	Mild	209	82.9	
		Moderate	36	14.3	
		Sever	7	2.8	
		Total	252	100.0	
	Cutoff point: Mild= (21-28), Moderate= (29-35), Sever= (36-42)				

Tab. 5. Distribution of pregnant mothers occupational factors.	Occupation		Sometime	Always	Total	Mean	Assess
	Are you exposed to radioactive material?		52	31	252	2.55	Good
	Is your work environment humid?	148	87	17	252	2.52	Good
	ls your workplace noisy?	112	109	31	252	2.32	Fair
	Do you work in detergents products?	155	73	24	252	2.52	Good
	Do you carry heavy things at work?	133	96	23	252	2.44	Good
	Do you work on the computer for a long time?	171	57	24	252	2.58	Good
	Do you stand for a long time at work	76	125	51	252	2.10	Fair
	Do you sit for long periods at work?	80	116	56	252	2.10	Fair
	Do you walk a lot at work?	79	122	51	252	2.11	Fair
	Were you satisfied with your workplace?	109	80	63	252	1.82	Fair
	How tired were you after work	126	96	30	252	2.38	Good
	Did you feel the authorities at your workplace realize your condition	69	151	32	252	1.85	Fair
	What do you think about the amount of your activities at work during pregnancy	118	118	16	252	2.06	Fair
	Stress at workplace	57	154	41	252	2.00	Fair
	Did you go to health facility for prenatal care at recommended times?	68	117	67	252	1.94	Fair
	Did you do the routine prenatal tests?	60	148	44	252	2.06	Fair
	Did you visit a doctor when you became sick (physically or mentally)?	58	121	73	252	2.10	Fair
	Did you visit a dentist in case of feeling any discomfort in your mouth or teeth during pregnancy	58	111	83	252	1.98	Fair
	Did you use any chemical medicines without doctor's prescription?	64	118	70	252	2.11	Fair
	Overall mean			2.19			Fair



Tab. 6. Correlation between preg- nant mothers' occupational factors and pregnancy complications.	Variables		Overall Pregnancy Complications		
	Occupation	Pearson Correlation	217-		
		Sig. (2-tailed)	.001		
		N	252		
	. Correlation is significant at the 0.01 level (2-tailed).				

Looman, et al. [1] in Egypt discovered that a substantial part of women worked at public institutions or attended to domestic roles. Economic conditions of families align with research in other developing countries since 48.8% considered their financial status "barely sufficient" which affects families' ability to access healthcare services. Financial difficulties prevented Pakistani women from obtaining prenatal medical care according to Bilhartz & Bilhartz [5] research.

The 44.8% of pregnant women with normal BMI fall closely in line with Brazilian statistics from Tsai [6] who observed that numerous pregnant women maintained normal BMI values. This study generates concern because of the high overweight (43.3%) and obesity (11.9%) rates among participants even though the World Health Organization (WHO, 2020) has identified this global pregnancy weight trend. The high frequencies of overweight and obese pregnant women call for specific intervention programs to combat obesity because it increases the risk of complications such as gestational diabetes and hypertension.

A large portion of participants (60.3%) experienced their first period at ages 11-12 and most of these women (73%) reported regular menstrual cycles based on Table 1. Early menarche and normal menstrual patterns exist frequently within Turkish women of reproductive age as reported by Tsai [6]. This data matches results from Tsai [6] who studied British women by showing that menstruation lasts between 5-7 days for 36% of participants and occurs approximately every 28-30 days for 62.3% of female respondents.

The substantial number of women experiencing abnormal menstrual irregularities (27%) should be considered a cause for concern since unusual bleeding patterns can indicate health problems within the reproductive system. Author Bilhartz & Bilhartz [5] from their Indian study discovered that women who face irregular menstrual cycles typically develop PCOS and infertility issues. Additional research should explore reproductive health conditions because of the high percentage of women displaying irregular menstrual periods.

In regard to pregnancy complications anemia ranked as the main one affecting woman because it produced a mean score value of 1.89. The research findings match those presented by Spadarella, et al. [4] who studied Indian pregnant women in low-income locations and found anemia to be a significant public health concern. The high rate of anemia in this research population demands specific intervention programs to alleviate the issue including iron supplementation and better dietary strategies.

Results of recent study indicates that 82.9% of research participants experienced mild pregnancy complications while findings by Spadarella, et al. [4] from Brazil demonstrated that pregnancy complications are mainly moderate. The healthcare system needs better services because moderate (14.3%) and severe (2.8%) complications exist among patients.

A large number of expectant women 65.9% received moderate occupational risks according to the self-reported assessment of occupational conditions. The results match Croteau, et al. [7] who observed numerous pregnant women across Low- and Middle-Income Nations (LMICs) receive moderate occupational exposures because workplaces commonly lack essential protection measures. According to Whelan, et al. [8], pregnant women throughout LMICs regularly face moderate-level occupational threats that boost their chances of developing preterm birth and low birth weight complications.

According to Marshall, et al. [9] pregnant women in high-income countries benefit from better workplace accommodations including minimized work hours along with ergonomic enhancements to decrease occupational risks. The level of workplace protection for pregnant workers stands higher in high-income nations in comparison to lesser-middle-income countries where workers face moderate occupational risks. The results show normal occupational exposures at work may lead to pregnancy complications when employers do not provide suitable workplace safety measures. The studies by Sharma, et al. [10] reveal that both moderate workrelated stressors and physical demands prove hazardous for maternal blood pressure control and early labor onset. Pregnant women who face moderate occupational risks are more prone to develop anemia and fetal growth restriction as medical complications.

Pregnant women showing lower occupational risk exposure according to Almeida, et al. [11] demonstrated better pregnancy results underlining the importance of minimizing occupational threats for pregnant women. The results from this research demonstrate that workplace strategies need to focus on reducing moderate workplace dangers especially in understaffed locations.

Pregnant women need workplace interventions which aim to decrease moderate risks associated with their work environment. Croteau, et al. [7] suggested specific actions for the workplace support of pregnant workers which included ergonomically adjusting conditions and controlling hazardous exposures together with limited workday schedules. Whelan, et al. [8] documented why workplace policies which provide flexibility for pregnant workers with maternity leave access are essential.

The analysis discovered that strenuous occupational responsibilities which involved long hours of standing or heavy manual tasks and hazardous material contact directly connected to pregnancy difficulties. The findings from Croteau, et al. [7] show that physical job requirements elevate the chances of miscarriage and preterm birth alongside low birth weight through their meta-analysis research. Office hazards including heavy lifting and prolonged standing lead to adverse pregnancy results particularly within Low- and Middle-Income Countries (LMICs) because these nations typically lack proper workplace protections for pregnant workers according to Whelan, et al. [8].

Occupational stress functions as a significant component that leads to pregnancy complications based on the results of the research. Research conducted by Sharma, et al. [10] demonstrates that excessive workplace stress leads to elevating probabilities of preterm birth combined with preeclampsia occurrence. Stressed work places with extended hours and significant work requirements lead to adverse maternal health results and affect fetal development. Scientific evidence demonstrates that work-related stress requires direct attention because it presents a changeable risk factor during pregnancy that leads to complications.

CONCLUSION

The research study examined how occupational elements and sociodemographic aspects influence pregnancy-related health problems for pregnant women in Hilla City Iraq. The research shows that working pregnant women experienced workplace conditions at an acceptable level amounting to 65.9% of total respondents. Workplace satisfaction along with stress and prolonged standing received decreased rankings which show there is room for better workplace policies that would support pregnant employees during their work.

Occupational factors characterized by physically demanding work and prolonged standing and occupational stress demonstrated main contributions to various pregnancy complications such as preterm birth and low birth weight and gestational hypertension. Women belonging to different age groups and education levels combined with rural residence created higher risk factors for pregnancy complications.

The health status of maternal-newborn pairs benefited from the fact that 82.9% of participants faced only minimal pregnancy complications. Severe pregnancy complications along with moderate ones exist at 14.3% and 2.8% rates respectively which necessitates targeted population-specific prevention programs and enhanced healthcare access for rural communities.

RECOMMENDATIONS

Based on the study's findings, the following recommendations are proposed:

- The Health Service need to produce individualized care plans specifically designed for pregnant women who show increased risk patterns like younger (<20 years) or older (≥35 years) mothers and those with limited education level.
- The hospitals need to launch health education programs that teach pregnant women essential information including prenatal care significance along with healthy life choices and early symptoms identification of pregnancy complications.
- 3. The workplace needs ergonomic modifications which include seating when employees need to stand along with procedures that reduce physical strain from heavy lifting tasks.
- 4. Employers need to develop protective security measures for pregnant women through occupational safety guidelines which include exclusion zones for risky substances and loud noise and radiation exposure.
- Rural medical services require improvement through an enhanced infrastructure to provide equal access to proper prenatal care together with scheduled antenatal appointments and fast detection of issues.
- Rural communities need to receive educational campaigns aimed at teaching pregnant women about the significance of receiving prenatal care and swift medical assistance.
- The healthcare system should provide stress management programs together with counseling support to pregnant women especially those whose jobs create high levels of stress and those who live in extended families.
- The long-term effects of sociodemographic factors together with workplace variables on pregnancy results must be examined through repeated study methods.
- The advocacy needs to target workplace protections that support reproductive health through paid maternity leave as well as workplace accommodations along with universal prenatal care availability.

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