
Socio-demographic Background of Pregnant Women with Newborns' Adverse Pregnancy Outcomes: Case – Control Study

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Abstract:

Background: Adverse pregnancy outcomes regarding newborns, such as preterm birth, post-term birth, low birth weight, macrosomia, still birth and congenital anomalies are found to be associated with several socio-demographic factors such as certain level of education, household crowding and some social class. In this study, all adverse pregnancy outcomes regarding infants were analyzed with the most scientific social etiology of diseases and others.

Objectives: To examine the association of different socio-demographic factors among women with abnormal perinatal outcomes & to compare the results with that of women delivering healthy newborns as a control group.

Patients & Methods: A Retrospective Case-control study, where 100 pregnant women with newborns having adverse pregnancy outcomes were selected as cases. Another 100 women without adverse outcome among newborns were selected as control group.

Data collection tools include assessment of socio-demographic features in relation to personal characteristics, life events and social context. In addition, age, parity and education. Social class identification according to occupational social classification then was obtained.

Results: Regarding socio-demographic factors, low educational level of mothers appeared to be significantly associated with the development of adverse pregnancy outcomes ($P=0.05$). Concerning social context, household overcrowding was significantly associated with the occurrence of such outcomes ($P=0.007$). About social class, class III appeared to have a protective effect ($P=0.02$) whereas class V have a significant risk with the development of these adverse outcomes ($P=0.01$).

Conclusion: Women with low educational level, household overcrowding and Social class V have significant association with the development of adverse pregnancy outcome of newborns.

Key words: Socio-demographic, adverse pregnancy outcomes.

Introduction:

Pregnancy constitutes a time of significant life changes require major psychological adjustment and often associated with anxiety and stress, so, lack of psychological and emotional adjustment during pregnancy constitute a risk factor for the mother¹.

Although all women do not find pregnancy stressful, growing evidence suggested that prenatal stress puts a woman at greater risk for a variety of poor birth outcomes².

Socio-economic position refers to the social and economic factors that influence a person status within the structure of the society and this socio-economic position has been related to a range of health outcomes including morbidity, poor self-rated health and mortality at different stages in their life course via a number of, possibly interacting mechanisms. By this fact, pregnancy and early childhood are particularly vulnerable periods of time at which adverse social circumstances have long lasting effects³.

In addition, some of the most consisting finding in public health researches are the large socio-economic position disparities in pregnancy outcome such as low birth weight and preterm birth and these two outcomes are considered key effects due to the strong association with infant mortality, long term morbidity and high health care costs³.

It has been found that, the proportion of women employed during pregnancy has increased constantly during the previous four decades, so the type of work and environmental exposure in the working environment may have an adverse effect on fetal development⁴.

Moreover, stress factors during pregnancy may range from poor relationship with the husband to

various social issues in the environment⁵, Other demographic characteristics of the pregnant woman such as age, parity, education have also an adverse effect on the pregnancy outcome of the newborn⁶, that is: advanced maternal age more than 35 years is associated with many complications such as pregnancy induced hypertension (PIH), gestational diabetes (GD), preterm delivery, low birth weight,

Macrosomia and antepartum hemorrhage (APH)⁷ while teenage pregnancy (woman less than 19 years) is associated mainly with preterm birth, poor maternal weight gain and maternal anemia⁸.

Lastly, the risk of delivering low birth weight baby has greater percentage among grand multipara (parity more than 5) compared with lower parity mothers in addition to increase the risk of a "very low birth weight baby" (weight less than 1500 gm)⁹. And maternal education as an indicator for socio-economic status might reflect a collection of influencing factors which are unique for particular groups of patients and might stand for differences in the utilization of the health care system¹⁰.

Aim and objectives:

1. The aim of the present study is to analyze different socio-demographic factors among women with poor perinatal outcomes in relation to the following:
 - 1- Personal characteristics
 - 2- Life events
 - 3- Social context
 - 4- Occupational social classification
 - 5- Demographic characteristics (age, parity and education).
2. To compare the results with that of women delivering healthy newborns as a control group

3. To find socio-demographic characteristics that is statistically associated with occurrence of adverse outcomes.

Patients and Methods:

In order to achieve the aim of the present study, a case-control study design was adopted, where 100 pregnant women from Al-Batool maternity hospital in Mosul city were enrolled in this study as cases according to the following inclusion criteria:

- 1- The participant must be pregnant woman (14-49 years old) after 24 weeks of gestation.
- 2- The newborn has adverse birth outcome.

Another 100 women from the same hospital were chosen as controls with the following inclusion criteria:

- 1- The participant must be pregnant woman (14-49 years old) after 24 weeks of gestation.
- 2- The newborn does not have adverse birth outcome.

Definitions of adverse pregnancy outcome of newborns: by WHO:

- 1 -**Low birth weight:** a birth weight less than 2500 gm^{11,12}.
- 2 -**Macrosomia:** a birth weight more than 4000 gm¹³⁻¹⁶.
- 3 -**Preterm birth:** as delivery before 37 completed weeks and after 24 completed weeks of gestation¹⁷⁻¹⁹.
- 4 -**Post term:** a delivery after 42 completed weeks of gestation^{20,22}.
- 5 -**Intrauterine fetal death (still birth):** is the death of the fetus before birth and after 24 completed weeks of gestation^{21,22}.
- 6- **Congenital anomalies** are something that is unusual or different at birth either²³:
 - Minor anomaly which has no serious medical or cosmetic effect on the patient (extra-digit).
 - Major anomaly which has serious medical or cosmetic effect on the patient (VSD).

Un-paired sampling technique was used in this study. Every woman in this study was interviewed by the researcher and the following questions were answered. Social class of the study subjects was determined according to occupational social classification²⁴. Moreover, socio-economic characteristics were obtained according to the following²⁴:

I – Personal characteristics:

A- Social identity:

Not modifiable: age, sex and hereditary.

Modifiable as occupation (women employment)

B- Personal habits:

Sedentary life style.

Smoking.(of the pregnant woman before and/or during pregnancy).

Unhealthy dietary behaviors.

C- Psychological make-up:

Personality type A

Personality type B

(The type of the personality has been determined according to the following characteristics: person with personality A is characterized by competitive impatience and free flouting and thought to be dashing, practical, active, showing-off and easily mixed with people, while person with type B behavior lacks these characteristics i.e. she thought to be reserved, shy and generally keeps to herself²⁴).

II – Life Events:

A- Stress

(Stress is defined according to WHO as unsuccessful attempt on the part of the body to deal with adverse factors in the environment. The information regarding this subject has been looked for just by asking the patient whether she is under continuous stress during the last 6 months²⁴).

B- Social Discontinuities.

C- Geographical mobility:

- Rural to urban, Urban to rural of any type (optional or not) and within 1 year.

D- Catastrophic life events.

III – Social Context:

A- Economic factors:

- Unemployment.
- Sudden loss or gain of huge deal of money.

B- Social disintegration

C- Urbanization:

- Urban or rural
- Crowding index

D- Social class.

Social class has been determined according to the job of the husband, and according to Occupational Social Classification in England and Wales in 1911, social class is divided into 5 groups²⁴:

Table 1: Occupational Social Classification in England and Wales in 1911

Social class	Occupational description	Occupation
I	Professional occupation	Doctors, lawyers, company directors
II	Intermediate occupation	Teachers, nurses, managers, civil servers
III-N	Non-manual skilled occupation	Clerical workers, secretaries
III-M	Manual skilled occupation	Jointers, electricians, butcher, bus drivers
IV	Partly skilled occupation	Machine operators, farm workers
V	Unskilled occupation	Laborers, cleaners

Demographic characteristics include ⁵:

- 1- Age.
- 2- Parity.
- 3- Maternal education:
 - Illiterate – primary.
 - Intermediate – secondary.
 - College – higher education.

χ^2 - test was used to look for the presence or absence of an association, Odds ratio (OR) with its 95% confidence interval (95% C.I.) were also computed. P-value less than or equal to 0.05 was considered statistically significant and all the statistical analysis was done using the statistical program SPSS 11,

Java-Stat (EBM) and also by using Miettinen's test-based approach ²⁵ where:

CI=OR^(1±1.96/x), X= square root of X² value
 OR^(1+1.96/x)=CI for upper value, OR^(1-1.96/x)=CI for lower value

Results:

The mean ages of the study population was 26.7 years for cases and 26.8 years for controls. The results of examining social risk factors in the development of adverse pregnancy outcomes appeared as the following:

Table 2: The association of demographic characteristics with the development of adverse pregnancy outcomes

Demographic Characteristics	Cases=100 No. %		Control=100 No. %		OR	P-value*	χ^2 -value	95%CI
<19 age(years) >35	12	12	13	13	0.91	0.83	0.046	0.40-2.08
Parity ≥ 5	17	17	21	21	0.77	0.47	0.520	0.38-1.56
Education								
Illiterate-primary	92	92	83	83	2.36	0.05	3.703	0.99-5.62
Intermediate-secondary	4	4	11	11	0.34	0.06	3.532	0.11-1.05
College-higher education	4	4	6	6	0.65	0.52	0.421	0.18-2.38

*Chi square test for contingency table was used, Degree of freedom (d.f.) =1

Table (2) reveals that illiteracy and low educational level have a high statistically significant association with the development of adverse pregnancy outcome with OR=2.36 and P = 0.05.

Table 3: The association of Personal characteristics with the development of adverse pregnancy outcomes

Personal characteristics	Cases=100 No. %		Control=100 No. %		OR	P-value*	χ^2 -value	95% CI
Family history	15	15	8	8	2.03	0.12	2.407	0.84-4.91
Women employment	6	6	3	3	2.06	0.31	1.047	0.51-8.26
Sedentary life style	12	12	17	17	0.67	0.31	1.01	0.30-1.45
Smoking	2	2	2	2	1	1	0.000	0.14-7.25
Unhealthy dietary behaviors	81	81	78	78	1.2	0.59	0.276	0.61-2.38
Personality B	37	37	31	31	1.31	0.37	0.802	0.73-2.34

*Chi square test for contingency table was used, d.f. =1

Table (3) illustrates personal characteristics of the study sample and their mode of association with the development of adverse pregnancy outcomes. The risk of adverse pregnancy outcome increase in association with certain personal characteristics such as family history, women employment, unhealthy dietary habit and type of personality (OR>1), the results does not reach statistical significance.

Table 4: The association of certain life events with the development of adverse pregnancy outcomes

Life events	Cases=100 No. %		Control=100 No. %		OR	P-value*	χ^2 -value	95%CI
stress	30	30	30	30	1	1	0.000	0.55-1.83
Social discontinuities	5	5	11	11	0.43	0.12	2.446	0.15-1.23
Geographical mobility	21	21	13	13	1.78	0.13	2.268	0.84-3.75
Catastrophic events	8	8	3	3	2.81	0.12	2.405	0.73-10.85

*Chi square test for contingency table was used, d.f.=1

Table (4) reveals that geographical mobility and catastrophic life events also increase the risk of diverse pregnancy outcome with OR >1 but not reach statistical significance (P >0.05).

Table 5: The association of social context with the development of adverse pregnancy outcomes

Social context	Cases=100		Control=100		OR	P-value*	χ^2 -value	95%CI
	No.	%	No.	%				
Economical factors	67	67	76	76	0.64	0.15	1.987	0.35-1.19
Urbanization	3	3	5	5	0.59	0.47	0.521	0.14-2.51
Crowding > 8	62	62	43	43	2.16	0.007	7.238	1.23-3.8

*Chi square test for contingency table was used, d.f. =1

Table (5) discloses the association between social context and adverse pregnancy outcome and it reveals that the risk of adverse pregnancy outcome was significantly increase in women who live in overcrowded households i.e. more than 8 person in the household (OR=2.16, P=0.007).

Table 6: Association of social class with adverse pregnancy outcome

Social class	Cases=100		Control=100		OR	P-value*	χ^2 -value	95%CI
	No.	%	No.	%				
I & II	3	3	3	3	1	1	0.000	0.2-4.99
III	30	30	46	46	0.5	0.02	5.433	0.28-0.89
IV	19	19	20	20	0.94	0.85	0.032	0.47-1.88
V	48	48	31	31	2.06	0.01	6.047	1.16--3.66

*Chi square test for contingency table was used, d.f. =1

Table (6) tells that women in social class III appeared to be protected against the development of adverse pregnancy outcomes in high statistically significant way (OR=0.5, P=0.02) while women in social class V are at increased risk of developing such adverse outcomes again in high statistically significant mode (OR=2.06, P=0.01).

Discussion:

The relation between specific socioeconomic circumstances and specific health outcomes can vary between countries due to differences in the cultural context of the socioeconomic position indicators. Such difference can provide useful insight into the causes of health inequality²⁶.

In this study demographic characteristics such as maternal age and parity are out of estimation, since matching of control was on the basis of these two criteria in this case-control study enrolling reproductive age women.

Although there are number of studies that was found an association between delaying child birth and adverse obstetric outcome, other studies challenge these finding as the number of pregnant women with advanced age continue to grow, obstetric care providers would benefit from up-to-date outcome data to enhance their preconceptual and antenatal counseling⁷⁻¹¹.

Regarding parity, this study showed no increase in risk of adverse pregnancy outcome among women with high parity. In consistent with previous studies that showed no increased risk of intrapartum and newborn complication among grand and great grand multiparous women since multiparity are less liable for instrumental or surgical interference and have low risk of fetal distress, malpresentation and birth injury²⁷.

In the current study, only the group of women with the lowest educational level had a significantly increased risk for different adverse pregnancy outcomes.

As education is one of the indicators of socioeconomic status so women with low socioeconomic status seem to have an accumulation of adverse circumstances especially regarding psychological stress and unhealthy lifestyle habits. Previous studies on educational inequalities explained that 89% of the elevated risk of preterm birth occurred among the lowest educated women²⁶⁻²⁸.

Several personal characteristics like environmental exposure in the working environment, smoking are suggested to increase the risk of adverse pregnancy outcome such as low birth weight and small for gestational age babies⁴. In this study, the high numbers of unemployed women have largely contributed to the occupational inequality among cases and control most of these cases were found to have no family history of similar adverse pregnancy complication. In addition the risk of maternal stress or exposure to severe life events like death or serious illness in close relatives and sudden gain or loss of huge money is higher among the cases nevertheless is not significantly increased among women of adverse outcome of pregnancy. Although previous population-based cohort study suggested that, antenatal maternal exposure to severe life events could be associated with a modest increase in the risk of preterm birth²⁹, other studies have questioned the association, the possible potential explanation for such conflicting conclusion include poor definition of stressor and inadequate sample size²⁸⁻²⁹.

Regarding the influence of social context on pregnancy outcomes, only household overcrowding was significantly increased among cases with adverse outcomes. Household density has long been viewed as an indicator of a stressful situation associated with morbidity and with increased incidence of chronic condition and a high perinatal mortality rate³⁰.

Adverse pregnancy outcome was significantly increased among women with low social class (class V), whereas, a protection effect of such complication has been observed among social class III women i.e. middle social class, this section of population is the most class to seek medical advice and antenatal care²⁴. In contrast to low social class population that showed higher rate of chronic illnesses and poor pregnancy outcomes such as congenital anomalies and early child morbidity and mortality^{31,32}. Many authors found social difference between preterm birth and low social status and that social class is the best defined according to paternal occupation³¹⁻³³.

In conclusion, this study confirms the association of some socio-demographic factors such as maternal education, household overcrowding and social class with the development of adverse pregnancy outcomes.

Critiques on this study:

Although, researchers of this work tried their best, but some limitations of case-control study design cannot be eliminated such as small sample size, lack of generalizability of results and recall bias. In addition, the sample was not representative to the whole population of concerns, since not all deliveries took place in maternity hospitals as many other developing countries.

Ethical issues:

Oral consent was obtained from all participants in this study. In addition, no name was taken from all participants, only code no. Moreover, all information were handled in high security manner. Finally, aim and objectives of this study were explained to all participants in this work and all ethnic characteristics were neglected.

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