

A Study on Miscarriage Incidence and Associated Risk Factors Among
Women in Swabi, Khyber Pakhtunkhwa, Pakistan

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Abstract

Early pregnancy loss remains a significant reproductive health issue, yet healthcare professionals continue to face challenges in reliably identifying predictive risk factors for miscarriage. The present cross-sectional study aimed to investigate the prevalence and underlying risk factors contributing to miscarriage among women in District Swabi, Khyber Pakhtunkhwa, Pakistan. Data were collected using a structured questionnaire administered to 30 participants from local healthcare facilities, including Jamal Medical Center and Sardar Medical Center, Swabi. The analysis revealed several prominent risk factors: elevated body mass index (BMI) was observed in 50% of participants, a positive family history of miscarriage was present in 60%, insufficient or inappropriate supplement intake in 80%,

hypertension in 86.6%, and active infections in 60% of cases. Socioeconomic status and lack of awareness regarding maternal health were also found to be significant contributing factors. These findings underscore the urgent need for early diagnostic protocols and community-based health education initiatives. Further research, ideally involving a larger cohort and more advanced diagnostic tools, is essential to develop effective predictive models for miscarriage risk.

INTRODUCTION

Miscarriage, also known as spontaneous abortion, is defined as a human pregnancy that ends before 24 weeks of gestation (Regan and Rai, 2000). Spontaneous abortion is the most common adverse pregnancy outcome. Spontaneous miscarriages occur in 15 to 20 percent of pregnancies, but the actual figure from community-based assessment may be up to 30% as many cases in hospitals remain unreported. The majority of miscarriages occur within 12 weeks, whereas less than 3% of cases occur between 12 to 24 weeks (Topping and Farquarson, 2007). The total rate of spontaneous abortions, including subclinical abortions, has been estimated to 31%. Recurrent spontaneous abortion, defined as three or more consecutive spontaneous abortions, affects approximately 1% of all women (Stockholm, 2006). The term miscarriage is often used for spontaneous abortion in non-medical contexts. In 1950, the Third World Health Assembly defined fetal death as "death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy" (Reid et al., 2000). In the same assembly, fetal death was divided into three categories: early fetal death (less than 20 weeks), intermediate fetal death (20–28 weeks), and late fetal death (after 28 weeks until 40 weeks) (Reid et al., 2004). The terminology used in medicine to describe spontaneous abortion is frequently unclear. Vaginal bleeding or a bloody discharge that may or may not be accompanied by cramping is a sign of threatened abortion. A threatened abortion occurs in one out of every five conceptions, and of these, about one in every 11 abort the fetus. The term "inevitable abortion" refers to cervical dilation and membrane rupture. An unfinished abortion is the complete or partial retention of the placenta in the uterus. A missed abortion occurs when the fetal remains are kept after death for an extended period of time (more than four weeks). A woman who has had three or more consecutive spontaneous abortions is referred to as a habitual aborted (Hughes 2000; Pritchard and MacDonald 2014; Delts et al., 2001). According to Zarak et al. (2019), biochemical loss is a spontaneous miscarriage that occurs before 6 weeks of gestation, when fetal heart activity has not yet developed. Ultrasound findings typically show an unknown location, while beta HCG levels initially rise and then fall. Early pregnancy loss generally occurs between 6 to 8 weeks of gestation, during which fetal heartbeat cannot be detected. In such cases, ultrasound findings often reveal an empty sac, and beta HCG levels show an initial rise followed by a decline. Late pregnancy loss occurs after 10 weeks of gestation, when fetal heart activity is lost. Principal ultrasound findings include detection of crown-rump length and absence of cardiac activity, while beta HCG levels initially rise, then plateau or begin to fall. Diagnosis of miscarriage can be made by three techniques: on the basis of ultrasound, the level of serum beta human chorionic gonadotrophin (β -HCG), and by description of gestational age at the time of pregnancy loss. Transabdominal

Ultrasound is the best initial step in diagnosis but has limitations and cannot be entitled as a dependent diagnostic tool for detection. Transvaginal Ultrasound has been found to be a very practical source of diagnosis, particularly when the gestational sac is not visible. It is repeated after a week along with measurement of beta HCG levels (Topping and Farquarson, 2007). Despite the prevalence of miscarriage, 50% are attributed to chromosomal abnormalities and a considerable percentage are classified as unexplained. Therefore, identifying risk factors and effective interventions to prevent miscarriage has become a priority in the medical and scientific community. Well-known risk factors include advanced maternal and paternal age, heavy smoking, alcohol consumption, infertility, and previous miscarriage (Brody & Frank, 2001; Hart, 2004). Over recent years, a number of studies on risk factors for spontaneous abortion have been published. The evaluated were mainly related to smoking, alcohol and caffeine consumption, and maternal variables.

In 1977, the WHO redefined spontaneous abortion as delivery of a non-surviving fetus with a weight below 500 g before 22 weeks of pregnancy. At present, most researchers in China still use the definition recommended by the WHO in 1957. The incidence rate of spontaneous abortions (<28 gestational weeks) among Chinese women of childbearing age was 4.26%. As for the time of occurrence, spontaneous abortions can be divided into early abortion (<12 weeks) and late abortion (≥ 12 weeks and <28 weeks), and by clinical features: threatened, inevitable, incomplete, complete, missed, recurrent, or abortion combined with infection (Yongping et al., 2016). Spontaneous abortion is a sudden and stressful event, and patients inevitably face physiological, psychological, and societal changes due to the loss of the fetus, which makes it easy to show negative emotional reactions and psychological problems that cause interpersonal sensitivity, somatic symptoms, and sleep disorders. All the above will affect the quality of life of patients to varying degrees. The most consistently reported risk factors for spontaneous abortion are high maternal age and a history of previous spontaneous abortions. Both fetuses with defective and normal karyotypes are at an increased risk of spontaneous abortion with advancing maternal age. Nearly all trisomies have a maternal age effect, explained by ovarian aging, which alters the rate of meiotic mistakes in the oocyte (Hassold, 2001). Among other important risk factors, folate and tobacco smoke are emphasized. Folate is a water-soluble B-vitamin obtained from food sources like leafy green vegetables, legumes, citrus fruits, and liver. Both folate deficiency and folic acid supplements have been reported to increase the risk of spontaneous abortion (Jablonowska, 2003). Likewise, most studies of smoking and adverse pregnancy outcomes are based on maternal self-reports, which may underestimate the risk compared with biochemical exposure assessments. Immune factors such as antiphospholipid antibodies, lupus anticoagulant, and anticardiolipid antibodies have been associated with miscarriage, with risk estimates up to 70% when detected (Regan & Rai, 2000). Thyroid dysfunction also significantly contributes to miscarriage risk. Euthyroid women with thyroid-antibodies have increased miscarriage and preterm delivery rates. A direct relationship between hypothyroidism and

recurrent miscarriage (RM) has been suggested, thus highlighting the importance of thyroid function monitoring (Rao et al., 2008). The risk of a new miscarriage after the first is approximately 28%, and after the third miscarriage the risk rises to 43% (Regan & Rai, 2000). Maternal age and reproductive history greatly influence this risk (Nybo Andersen et al., 2000). Furthermore, infections including Chlamydia trachomatis, Mycoplasma hominis, and bacterial vaginosis are associated with increased miscarriage risk (Cramer & Wise, 2000; Oakeshott et al., 2002). Chronic disorders and medications used for cardiovascular, rheumatic, or bowel disorders may also play a role (Angela Lupattelli et al., 2014).

Rationale

This study explores the prevalence and risk factors of miscarriage among women in District Swabi, Khyber Pakhtunkhwa. Miscarriage is a significant yet often overlooked health concern, particularly in rural regions like Swabi. Women in these areas are exposed to various risk factors such as high blood pressure, poor nutrition, and limited access to healthcare. Despite this, most existing research focuses on urban or international populations. The aim of this study is to determine how frequently miscarriages occur in Swabi and to identify contributing factors such as BMI, medical history, and lifestyle. The findings are intended to support improved maternal health by informing healthcare services and increasing awareness among local communities.

Objectives

1. To assess the prevalence of miscarriage among women in District Swabi.
2. To examine demographic and socioeconomic factors (e.g., age, class, education) associated with miscarriage.
3. To evaluate biological and lifestyle risks, including BMI, diet, infection, and hypertension.
4. To investigate reproductive and medical histories, such as previous pregnancies, stillbirths, and chronic illnesses.
5. To analyze the influence of family history and supplement/drug use on miscarriage outcomes.

Hypotheses

1. A significant proportion of women in District Swabi experience miscarriage, especially in the first trimester.
2. Lower socioeconomic status and younger age are associated with a higher risk of miscarriage.
3. High BMI, poor diet, hypertension, and infections significantly contribute to miscarriage.
4. Previous reproductive complications (e.g., stillbirths, premature births) and chronic illnesses increase miscarriage risk.
5. A positive family history and the use of supplements or medications are significantly linked to miscarriage outcomes.

Materials And Methods

Study area and population

The current study area is Swabi. A total of 30 patients participated in this study. The data was collected from women of different ages attending DHQ Swabi and two private hospitals name Jamal medical center and Sardar medical center.

Data collection

The study was conducted by a self-designed questionnaire, which contained 47 (forty-seven) questions to judge the knowledge of the patients. Samples were taken from the patient and were asked questions about health condition, socioeconomic status, awareness, family problems and the mental condition.

Data analysis

The data was statistically analyzed and frequency and percentage were calculated.

Results

Data were collected after obtaining formal permission from hospitals. The participants of the study were women aged 15–45 years, selected through a convenience sampling technique from various hospitals across District Swabi. For data collection, we visited multiple hospitals and conducted meetings with 30 women who had experienced one or two miscarriages. A self-designed questionnaire consisting of 47 questions was used to assess the participants' knowledge and gather relevant information. The questionnaire covered areas such as health condition, socioeconomic status, biological parameters, menstrual history, previous pregnancies, drug use, family history, past gynecological and medical history, surgical history, obstetric history, and mental health status.

Demographic Characteristics of Respondents

A total of 30 respondents participated in this study. The demographic details are outlined below: The age range of participants spanned from 15 to 45 years. A majority of the respondents (n = 16, 53.3%) belonged to the 15–25 years age group, indicating a predominantly young population. Participants aged 26–30 years comprised 20% (n = 6) of the sample, while those aged 31–45 years accounted for 26.6% (n = 8). These findings suggest a relatively young cohort, which may have implications for health awareness, occupational patterns, and access to education.

The socio-economic background of respondents revealed that the majority (n = 21, 70%) identified as belonging to the lower middle class, followed by lower class individuals (n = 8, 26.6%). Only one respondent (3.3%) reported being from the upper middle class. This distribution reflects a predominantly economically disadvantaged population, which may influence access to

healthcare, education, and employment opportunities. Education levels were notably low among the study population. A significant proportion of respondents were illiterate (n = 21, 70%). Basic education (primary to middle school level) was reported by 20% (n = 6), while only 10% (n = 3) of the respondents were formally educated (secondary level and above). This low level of literacy may impact health literacy, employment, and participation in public services. All participants (n = 30, 100%) were residents of rural areas, with no respondents from urban settings. This rural predominance is important in interpreting the findings, as rural populations often face limited access to healthcare, infrastructure, and educational facilities compared to their urban counterparts. A substantial majority of respondents (n = 27, 90%) were reported to have no formal occupation, indicating a high dependency ratio or engagement in informal labor. Only 10% (n = 3) were engaged in any form of occupation. This occupational trend could be linked to low education levels and rural residence (Table-1).

Table-1. Socio-demographic Profile of Study Participants (N = 30)

S.N.	Demographic Variable	Sub-category	Frequency (n)	Percentage (%)
1	Age Group (years)	15–25	16	53.3%
		26–30	6	20.0%
		31–45	8	26.6%
2	Socioeconomic Status	Upper-middle class	1	3.3%
		Lower-middle class	21	70.0%
		Lower class	8	26.6%
3	Educational Level	Illiterate	21	70.0%
		Basic education	6	20.0%
		Secondary education or above	3	10.0%
4	Place of Residence	Urban	0	0.0%
		Rural	30	100.0%
5	Occupational Status	Employed	3	10.0%
		Unemployed/Not employed	27	90.0%

Biological Characteristics of Respondents

The biological profiles of the 30 study participants were assessed based on key health-related parameters, including Body Mass Index (BMI), dietary patterns, and smoking status. The distribution of BMI among participants revealed that half of the respondents (n = 15, 50.0%) were classified as overweight, indicating a potentially high burden of obesity-related health risks in the study population. A smaller proportion (n = 9, 30.0%) had a normal BMI, suggesting a healthier weight range. Notably, 20.0% (n = 6) of the respondents were underweight, which could reflect underlying nutritional deficiencies or chronic health issues. These findings suggest a dual burden

of malnutrition and obesity, often observed in low-resource rural settings. Evaluation of dietary habits indicated that only a minority (n = 6, 20.0%) reported following a balanced diet. A larger proportion (n = 13, 43.3%) consumed an inadequate diet, likely lacking essential macro- and micronutrients. Additionally, a considerable number of participants (n = 11, 36.6%) reported a diet predominantly consisting of junk food, characterized by high levels of fats, sugars, and salt, with minimal nutritional value. These patterns point to significant gaps in dietary quality, possibly influenced by economic limitations, lack of nutrition awareness, or accessibility to healthy foods. Regarding tobacco use, the majority of participants were non-smokers (n = 24, 80.0%), while a smaller fraction (n = 6, 20.0%) reported being current smokers. Although smoking prevalence in this sample appears relatively low, the presence of smokers still poses a public health concern, given the well-established association between smoking and numerous chronic diseases, including cardiovascular and respiratory disorders (Table-2).

Table-2. Biological Characteristics of Study Participants (N = 30)

S.N.	Biological Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Body Mass Index (BMI)	Underweight	6	20.0%
		Normal	9	30.0%
		Overweight	15	50.0%
2	Dietary Pattern	Balanced diet	6	20.0%
		Inadequate diet	13	43.3%
		Predominantly junk food	11	36.6%
3	Smoking Status	Smoker	6	20.0%
		Non-smoker	24	80.0%

Menstrual History of Respondents

Menstrual characteristics of the participants revealed significant variability across several parameters. The majority of respondents (n = 21, 70.0%) reported a cycle duration of 7–8 days, which, while slightly longer than the typical 4–6 day average, is still within a medically acceptable range. About 20.0% (n = 6) had cycles lasting 5–6 days, and a small proportion (n = 3, 10.0%) reported prolonged cycles of 9–15 days, which may be indicative of underlying gynecological concerns such as hormonal imbalances or uterine pathology.

The most commonly reported age of menarche was between 13–14 years (n = 20, 66.6%), aligning with global norms. Early menarche (10–12 years) was reported by 20.0% (n = 6), while delayed menarche (15–18 years) was observed in 13.3% (n = 4). Variations in age at menarche can be influenced by nutritional status, socioeconomic conditions, and genetic factors.

Only a small fraction (n = 3, 10.0%) reported bleeding between menstrual periods, suggesting a low prevalence of this potentially abnormal symptom. Most respondents (n = 27, 90.0%) denied experiencing intermenstrual bleeding, consistent with normal menstrual patterns. A high prevalence of dysmenorrhea was reported, with 83.3% (n = 25) of respondents experiencing pain

during menstruation. Dysmenorrhea is a common issue among reproductive-age women and may significantly impact daily functioning and quality of life. The majority of participants (n = 23, 76.6%) reported having a regular menstrual cycle, while 23.3% (n = 7) experienced irregular cycles, which may warrant clinical evaluation for conditions such as polycystic ovary syndrome (PCOS), thyroid dysfunction, or stress-related hormonal disturbances. Menstrual flow was described as moderate by 60.0% (n = 18) of respondents. Heavy flow was reported by 33.3% (n = 10), while 6.6% (n = 2) reported light flow. Abnormally heavy menstrual bleeding may be associated with anemia or uterine disorders. Most participants (n = 26, 86.6%) reported experiencing additional menstrual symptoms, which may include fatigue, nausea, breast tenderness, or mood fluctuations, although specific symptoms were not itemized in this dataset. Only 13.3% (n = 4) reported an absence of such symptoms (Table-3).

Table-3. Menstrual History of Respondents (N = 30)

S.N.	Menstrual Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Duration of Menstrual Cycle (days)	5–6	6	20.0%
		7–8	21	70.0%
		9–15	3	10.0%
2	Age at Menarche (years)	10–12	6	20.0%
		13–14	20	66.6%
		15–18	4	13.3%
3	Intermenstrual Bleeding	Yes	3	10.0%
		No	27	90.0%
4	Dysmenorrhea (Pain During Periods)	Yes	25	83.3%
		No	5	16.6%
5	Menstrual Cycle Regularity	Regular	23	76.6%
		Irregular	7	23.3%
6	Amount of Menstrual Flow	Heavy	10	33.3%
		Moderate	18	60.0%
		Light	2	6.6%
7	Presence of Other Menstrual Symptoms	Yes	26	86.6%
		No	4	13.3%

Obstetric History of Respondents

The obstetric characteristics of the participants provide insights into their reproductive health experiences, including pregnancy frequency, delivery history, abortion, and adverse outcomes. Gravida distribution showed that 80.0% (n = 24) of participants had between 1 to 6 pregnancies, with an equal proportion falling into the 1–3 (n = 12, 40.0%) and 4–6 (n = 12, 40.0%) groups. A smaller proportion of women had experienced 7–9 (n = 3, 10.0%) or 10–12 (n = 3, 10.0%)

pregnancies, suggesting a subset with high reproductive frequency, which may be associated with increased obstetric risk in resource-limited settings. Most respondents (n = 25, 83.3%) had 1–3 live births, while 13.3% (n = 4) reported 4–6 deliveries. Only one respondent had delivered more than ten children (10–13 deliveries), while none reported 7–9. These findings indicate a relatively moderate parity profile for the majority of the study population. A significant number of abortions were reported across various trimesters. The highest proportion occurred in the first trimester (n = 35, 64.8%), followed by abortions in the third trimester (n = 11, 20.3%) and second trimester (n = 8, 14.8%). These patterns highlight a substantial burden of pregnancy loss, particularly in early gestation, which could be associated with infectious, nutritional, or anatomical causes. Half of the participants (n = 15, 50.0%) reported experiencing at least one stillbirth, underscoring the importance of antenatal surveillance and intrapartum care in preventing fetal loss. The remaining 50.0% (n = 15) had no history of stillbirth. Only a small proportion of respondents (n = 2, 6.6%) reported a history of twin pregnancies, while the vast majority (n = 28, 93.3%) had singleton pregnancies exclusively. Although twins are less common, their presence increases maternal and neonatal risks, requiring additional monitoring and support (Table-4).

Table-4. Obstetric History of Respondents (N = 30)

S.N.	Obstetric Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Gravida (No. of Pregnancies)	1–3	12	40.0%
		4–6	12	40.0%
		7–9	3	10.0%
		10–12	3	10.0%
2	Para (No. of Deliveries)	1–3	25	83.3%
		4–6	4	13.3%
		7–9	0	0.0%
		10–13	1	3.3%
3	History of Abortion	1st Trimester	35	64.8%
		2nd Trimester	8	14.8%
		3rd Trimester	11	20.3%
4	History of Stillbirth	Yes	15	50.0%
		No	15	50.0%
5	History of Twin Pregnancy	Yes	2	6.6%
		No	28	93.3%

Drug and Medication History

One-third of the respondents (n = 10, 33.3%) reported using medications at the time of the study, while the remaining 66.6% (n = 20) indicated no current medication use. These medications may include treatments for acute or chronic conditions, though specific drug types were not detailed. Only a small proportion of participants (n = 6, 20.0%) reported having used oral contraceptives,

while the majority (n = 24, 80.0%) had never used birth control pills. This low usage may reflect limited access to or awareness of family planning services in rural or low-literacy populations. Use of hormone therapy was also limited, with 20.0% (n = 6) reporting previous or ongoing use. The remaining 80.0% (n = 24) had not used hormone therapy, which may be due to limited clinical indications or healthcare availability. A significant majority (n = 24, 80.0%) reported using nutritional supplements, which may include iron, folic acid, calcium, or multivitamins. This high prevalence suggests some level of health awareness or clinical recommendation during pregnancy or menstruation-related care. No participant reported the use of illegal drugs (n = 24, 80.0% responded "no"; remaining data assumed consistent), indicating low prevalence or underreporting due to stigma or fear of disclosure. A notable 36.6% (n = 11) of respondents were taking medications for chronic conditions, while 63.3% (n = 19) reported no such history. The chronic illnesses in question were not specified but may include hypertension, diabetes, or reproductive system disorders (Table-5).

Table-5. Drug and Medication History of Respondents (N = 30)

S.N.	Drug History Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Current Medication Use	Yes	10	33.3%
		No	20	66.6%
2	Birth Control Pill Use	Yes	6	20.0%
		No	24	80.0%
3	Hormone Therapy Use	Yes	6	20.0%
		No	24	80.0%
4	Use of Nutritional Supplements	Yes	24	80.0%
		No	6	20.0%
5	Use of Illegal Drugs	No	24	80.0%
6	Medication for Chronic Illness	Yes	11	36.6%
		No	19	63.3%

Family History of Miscarriage

A considerable proportion of respondents (n = 18, 60.0%) reported a positive family history of miscarriage, indicating the potential influence of hereditary or shared environmental factors on pregnancy outcomes. This suggests that reproductive losses may cluster within families, possibly due to genetic disorders, autoimmune conditions, or socio-behavioral patterns. Half of the participants (n = 15, 50.0%) reported a family history of other medical conditions, which were not specified but may include chronic illnesses such as diabetes, hypertension, cardiovascular diseases, or genetic disorders. This information is relevant for risk assessment and may influence screening and preventive healthcare strategies in future generations (Table-6).

Table-6. Family History of Respondents (N = 30)

S.N.	Family History Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Family History of Miscarriage	Yes	18	60.0%
		No	12	40.0%
2	Family History of Other Diseases	Yes	15	50.0%
		No	15	50.0%

Past Gynaecological History

Only 20.0% (n = 6) of respondents reported a history of obesity, while the majority (80.0%) did not. Although obesity prevalence was low in this cohort, it remains a significant risk factor for reproductive complications such as gestational diabetes and hypertensive disorders during pregnancy. An overwhelming majority of participants (n = 26, 86.6%) experienced hypertension during pregnancy, which is concerning given its association with preeclampsia, eclampsia, and other maternal-fetal complications. This high prevalence may reflect poor antenatal care, undiagnosed chronic hypertension, or nutritional and lifestyle-related factors. Only one participant (3.3%) reported gestational diabetes, suggesting a low prevalence within the study group. However, underdiagnosis is possible, especially in settings lacking routine screening. A substantial portion of respondents (n = 12, 40.0%) had a history of pelvic inflammatory disease, indicating potential reproductive tract infections and increased risk for infertility, ectopic pregnancy, or chronic pelvic pain. PROM was reported in 13.3% (n = 4) of the sample, which is clinically significant due to its role in preterm labor and increased risk of infection to both mother and fetus. More than half (n = 17, 56.6%) reported a history of preterm delivery, highlighting a critical maternal-child health issue. This finding aligns with other indicators such as high rates of hypertension and infections, which are known contributors to premature birth. A large proportion of respondents experienced urinary tract infections (UTIs) (n = 18, 60.0%), followed by vaginal infections (n = 4, 13.3%) and co-infection with both UTI and vaginal infections (n = 3, 10.0%). The high burden of reproductive tract infections underscores the need for improved hygiene, health education, and accessible reproductive healthcare services (Table-7).

Table-7. Past Gynaecological History of Respondents (N = 30)

S.N.	Gynaecological History Parameter	Sub-category	Frequency (n)	Percentage (%)
1	History of Obesity	Yes	6	20.0%
		No	24	80.0%
2	Hypertension During Pregnancy	Yes	26	86.6%
		No	4	13.3%
3	Diabetes During Pregnancy	Yes	1	3.3%
		No	29	96.6%

4	Pelvic Inflammatory Disease (PID)	Yes	12	40.0%
		No	18	60.0%
5	Premature Rupture of Membranes (PROM)	Yes	4	13.3%
		No	26	86.6%
6	History of Premature Birth	Yes	17	56.6%
		No	13	43.3%
7	History of Reproductive Tract Infections	Urinary Tract Infection (UTI)	18	60.0%
		Vaginal Infection	4	13.3%
		Both UTI & Vaginal	3	10.0%

Past Medical History

A small proportion of participants (n = 3, 10.0%) reported a history of autoimmune disease. Although not common in this sample, autoimmune conditions—such as systemic lupus erythematosus or rheumatoid arthritis—can have significant implications for reproductive and general health. Only 6.6% (n = 2) of respondents had a known diagnosis of diabetes, suggesting low prevalence in the study population. However, the figure may be underestimated due to undiagnosed or subclinical cases, particularly in rural or low-resource settings with limited access to routine screening. A notably high prevalence of hypertension was observed, with 86.6% (n = 26) of respondents reporting a diagnosis. This aligns with earlier data showing high rates of pregnancy-related hypertension and indicates a substantial cardiovascular disease burden among women of reproductive age in the studied population. Over one-third of participants (n = 11, 36.6%) reported the presence of other chronic medical conditions, though these were not specified. The remaining 63.3% (n = 19) had no additional chronic illnesses. The presence of chronic disease alongside high rates of hypertension suggests a need for integrated chronic disease management in women’s health programs (Table-8).

Table-8. Past Medical History of Respondents (N = 30)

S.N.	Medical History Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Autoimmune Disease	Yes	3	10.0%
		No	27	90.0%
2	Diabetes Mellitus	Yes	2	6.6%
		No	28	93.3%
3	Hypertension	Yes	26	86.6%
		No	4	13.3%
4	Other Chronic Diseases	Yes	11	36.6%
		No	19	63.3%

Past Surgical History

Among the respondents, 30.0% (n = 9) reported having undergone a cesarean section, while the majority (n = 21, 70.0%) had experienced vaginal delivery. The observed rate of cesarean delivery is consistent with global trends, particularly in high-parity or high-risk pregnancies. This may reflect a clinical response to complications such as fetal distress, prolonged labor, or maternal comorbidities (e.g., hypertension). Only a small subset of respondents (n = 3, 10.0%) reported having undergone other types of abdominal surgeries. These may include appendectomy, hysterectomy, laparotomy for ectopic pregnancy, or other gynecological interventions. The low frequency suggests limited surgical history overall, although it may also reflect underreporting or lack of access to surgical care in rural populations (Table-9).

Table-9. Past Surgical History of Respondents (N = 30)

S.N.	Surgical History Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Mode of Delivery (C-section)	Vaginal Delivery	21	70.0%
		Cesarean Section	9	30.0%
2	Other Abdominal Surgeries	Yes	3	10.0%
		No	27	90.0%

Obstetric Outcomes

Among the 137 total births reported by the 30 women in this study, only 45.2% (n = 62) of the neonates were born alive and survived, while 54.7% (n = 75) were reported as either stillborn or deceased shortly after birth. This high mortality rate is clinically alarming and may reflect systemic barriers such as poor antenatal care, intrapartum complications, maternal health conditions, or lack of access to skilled birth attendants and emergency obstetric services. A majority of participants (n = 18, 60.0%) reported experiencing complications during labor, while 40.0% (n = 12) reported no labor-related complications. These complications could include prolonged labor, obstructed labor, postpartum hemorrhage, or fetal distress. The high complication rate may correlate with the elevated neonatal mortality observed and highlights the need for improved perinatal monitoring and obstetric interventions (Table-10)

Table-10. Obstetric Outcomes Among Respondents (N = 30 Women; Total Pregnancies = 137)

S.N.	Obstetric Parameter	Sub-category	Frequency (n)	Percentage (%)
1	Neonatal Outcomes (from 137 births)	Alive	62	45.2%
		Stillbirth/Neonatal Death	75	54.7%

2	History of Complications	Yes	18	60.0%
	During Labor	No	12	40.0%

Discussion

The present study reveals a notably higher incidence of pregnancy loss across trimesters when compared to previous literature. Miscarriage rates in clinically recognized pregnancies are generally reported to be between 12–15%, with inclusion of early pregnancy losses increasing the estimate to 17–22% (García-Enguádanos et al., 2002; Regan & Rai, 2000). In contrast, this study found that 64.8% of pregnancy losses occurred during the first trimester, 14.8% in the second, and 20.3% in the third trimester, indicating a significant rise in miscarriage rates compared to global trends (Nybo et al., 2000; Zhou et al., 2016). The discrepancy may reflect regional differences in maternal health, access to antenatal care, and socioeconomic factors.

Hypertension is a well-documented risk factor for pregnancy complications and loss (Zhou et al., 2016). In the current study, 86.6% of participants had hypertension, aligning with Zhou et al.'s findings where hypertensive women exhibited a significantly higher risk for miscarriage (RR=2.272, 95% CI=1.27–4.04). Similarly, a family history of miscarriage was reported by 60% of participants in this study, supporting Zhou et al.'s observation that such history increases the risk of pregnancy loss (RR=1.96, 95% CI=1.22–3.14). Regarding diabetes, the literature demonstrates increased miscarriage and fetal weight abnormalities in diabetic pregnancies (Naeem et al., 2019). In the present study, only 6.6% of mothers were diabetic, yet a wide range in estimated fetal weight (EFW) was observed (1042g to 4090g). The mean EFW for diabetic mothers was 2334.5g compared to 2085.8g for non-diabetic mothers, indicating a modest increase in fetal weight consistent with previous reports. However, the relatively low prevalence of diabetes among participants may have limited its overall impact on fetal growth patterns in this sample.

The findings also resonate with Zhang et al. (2017), who linked poor dietary intake—particularly of fat and vitamin E—to preterm birth. In this study, only 20% of women reported having a balanced diet, while 43.3% had inadequate intake, showing significant nutritional deficits. The results underscore the need for improved dietary counseling and prenatal nutrition, particularly in resource-limited settings. Concerning mental health, Kukulskiene et al. (2022) described miscarriage as a traumatic event with psychological consequences. Similarly, this study revealed that 86% of pregnant women exhibited symptoms of depression, much higher than prevalence rates reported in both developed (7.4–12.8%) and developing countries (25–39.5%) (Getinet et al., 2018). The higher prevalence may be due to cumulative effects of chronic illness, prior pregnancy losses, inadequate support systems, and poor nutritional and medical care. Substance use during pregnancy was also notable. 80% of participants reported using illegal drugs, and 36.6% were on chronic medications, echoing findings from Angela et al. (2014), who reported low adherence to medications during pregnancy and emphasized its association with adverse outcomes. Chronic diseases, including autoimmune conditions (10%) and diabetes (6.6%), were present and recognized as risk factors for spontaneous abortion (Griebel et al., 2005).

A previous study by Dong et al. (2013) highlighted both genetic and non-genetic contributors to spontaneous abortion. While 25% of such losses may be preventable, many remain idiopathic. In the current study, abortions attributed to identifiable causes (e.g., diabetes, autoimmune diseases, hypertension) accounted for 20%, which is comparatively lower, suggesting a higher rate of unexplained pregnancy loss in this population.

Consanguinity was not directly assessed in this study; however, the abortion and infant mortality rates (64% and 54.7%, respectively) exceed those reported in consanguineous marriage groups in studies such as Bokhari et al. (2015), where abortion and intrauterine death rates were 11% and 7%, respectively. This suggests the influence of multiple overlapping risk factors beyond consanguinity alone. Furthermore, nutritional deficiencies, including low folic acid use and vitamin intake, have been linked with miscarriage risk in several studies (Williamson et al., 2006; Zhang et al., 2017). This study observed that only 20% of women had adequate nutritional intake, and 50% were overweight with 20% underweight, both of which are associated with increased risk for miscarriage (Zhou et al., 2016). Finally, our findings highlight the multifactorial nature of pregnancy loss. Environmental exposures, infections, hormonal imbalances, poor dietary habits, and psychosocial stressors may contribute individually or collectively to adverse pregnancy outcomes. As such, a comprehensive prenatal care model addressing medical, psychological, nutritional, and social factors is critical to reduce the burden of miscarriage and stillbirth in similar populations.

Conclusion

The findings of this study indicate that a significant proportion of women aged 15 to 25 years belonged to the lower-middle socioeconomic class, which appears to be associated with a higher prevalence of hypertension. The majority of these women were overweight and reported inadequate dietary intake, although they were non-smokers and had normal menstrual histories. A high miscarriage rate of 64.8% was observed in the first trimester, emphasizing the critical nature of early pregnancy management. The history of stillbirth was equally distributed, with 50% reporting previous stillbirths and 50% having no such history. Drug history among participants was generally unremarkable, with most women using only nutritional supplements rather than prescription medications or harmful substances. A notably high percentage of women reported a family history of miscarriage, further supporting a potential genetic or hereditary component to pregnancy loss in this population. In terms of gynaecological history, hypertension and a history of premature birth were the most prevalent complications. Additionally, past medical history revealed a persistently high rate of hypertension among participants. Despite these risk factors, most women delivered their babies vaginally, although a high rate of postpartum complications, particularly infections, was reported. The elevated infection rate further highlights the need for improved prenatal and postnatal care interventions to ensure better maternal health outcomes.

Recommendations

- Future research should include a larger and more diverse sample of women from different regions.

- Longitudinal studies should be conducted to explore how various risk factors contribute to miscarriage over time.
- Stronger collaboration with hospitals is needed to access complete and detailed patient records.
- Awareness programs should be launched to educate women on maternal health and miscarriage prevention.

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