
Factors Associated with Spontaneous Abortion (Miscarriage) Among Women in Ghana

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Abstract: *Background:* Spontaneous abortion in other words miscarriage is considered as one of the utmost frequent problems a woman may experience during early pregnancy which usually predominates from chromosomal abnormalities and hormonal problems. *Objective:* The main aim of the study was to identify maternal socio-demographic factors associated with spontaneous abortion among women in Ghana. *Methods:* Ghana Maternal Health Survey data was used for this study. Data analysis was done using SPSS version 20. The association between dependent and independent variables was explored using chi-square. Statistical significance was set at $p < 0.05$. *Results:* The prevalence of Spontaneous abortion history (ever had a miscarriage) among the respondents was 15.6%. Chi-square analysis revealed significant relation between miscarriage and the following demographic factors: age of the woman $X^2=1853.557$, $P \leq 0.001$, educational status $X^2=76.755$, $P \leq 0.001$, marital status $X^2=967.688$, $P \leq 0.001$, place of residence $X^2=23.410$, $P \leq 0.001$, ethnicity $X^2=45.195$, $P \leq 0.001$ and Regional belt $X^2=49.005$, $P \leq 0.001$. the study further revealed significant relation between miscarriage and other independent variable: age of first union $X^2=67.199$, $P \leq 0.001$, abortion history $X^2=113.804$, $P \leq 0.001$, exposure to radio $X^2=63.424$, $P \leq 0.001$, exposure to TV $X^2=16.403$, $P \leq 0.001$, exposure to mobile $X^2=190.179$, $P \leq 0.001$ and exposure to internet $X^2=44.528$, $P \leq 0.001$.

Keywords: Abortion, Factors, Ghana, Miscarriage, Spontaneous

1. Background

Spontaneous abortion in other words miscarriage is considered as one of the utmost frequent problems a woman may experience during early pregnancy which usually predominates from chromosomal abnormalities and hormonal problems [1]. Spontaneous abortion is the dissolution of pregnancy earlier 28 weeks from conception [1]. Reason related to the psychology of the term “abortions” to mean induced abortions or criminal, in clinical practice spontaneous abortions are referred to as miscarriages [2]. Approximately 10-20% of all pregnancies end as spontaneously before delivery [1, 3].

Traditionally, the diagnosis of spontaneous abortion has been followed by surgical curettage on the hypothesis that this reduces the risk of potential infections [3]. However, in the past decade, operational nonsurgical substitutions have been encouraged to decrease needless curettage whereas still upholding lower rates of morbidity and mortality [2, 3]. This has led to the appearance of expectant and medical

management options. Nevertheless, surgical evacuation continued to be the management of choice if the hemorrhage is extreme, unstable vital signs, presence of infected tissue in the uterine, or if the endometrial thickness is $>50 \text{ mm}^2$.

One of the key grounds for spontaneous abortion during the first trimester is associated with abnormal fetal development. Other implicated causal factors are: genetic issues, long-term health conditions, Infections, Weakened cervix, polycystic ovary syndrome (PCOS) [4].

According to Pam and Otubu approximately 50% of first trimester spontaneous abortions are related to chromosomal abnormality in the fetus [1]. Nevertheless, recognizable risk factors comprise of feverish infections (such as malaria, urinary tract or lower genital tract infections), smoking, alcohol ingestion, chronic medical disorders, advanced maternal age, increasing parity, increasing paternal age, previous miscarriage, or anatomical problems such as uterine or cervical abnormalities [1, 4]. A study result indicated that miscarriage or abortion was related to an older age [5]. The risk of miscarriage is reported

15.0% for those under 35 years, 20.0 – 35.0% for those between 35.0 – 45.0 years, and 50.0% for those over 45 years [6].

Recently a study regarding the birth outcome and climate change reported significant relations between climate change variables and the pregnancy-associated outcomes such as eclampsia, preeclampsia, congenital cataract, low birth weight, preterm birth, sex ratio, and length of pregnancy [7].

Results of a study indicated that rural women were 1.68 times more likely to suffer spontaneous abortion than those in urban. Also, higher income status and educational level were related to decrease risk of spontaneous abortion (AOR=0.90, 95%CI: 0.84–0.97) and (AOR=0.90, 95%CI: 0.82–0.98) respectively [8].

It is reported that women with a history of several abortions or more than one miscarriage have an increased risk of challenging successive pregnancies [5]. Amongst the recognized complications are: vaginal bleeding, pre-term birth, low birth weight, and placenta complications. Women, who experience a single abortion in pregnancy during the first trimester, are 30 percent more possible to face complications in a future pregnancy, than women who have not experienced abortion [5].

Even though maternal mortality is not common with spontaneous abortion morbidities such as psychological stress, hemorrhage, sepsis, secondary infertility, and recurring spontaneous abortions can occur [2]. This paper aimed to identify the association between maternal socio-demographic risk factors and spontaneous abortion in Ghana using a national maternal health survey.

2. Materials and Methods

The study design for this study was a descriptive cross-sectional survey using data from the 2017 Ghana Maternal Health Survey (GMHS). The 2017 GMHS was executed by the Ghana Statistical Service (GSS) with technical support from ICF through the Demographic and Health Survey (DHS) program. The sampling frame adopted was from the Ghana 2010 Population and Housing Census (PHC). This included all women aged 15–49 years who were permanent occupants of selected households or visitors who stayed in selected households the night before the survey were qualified participants. A multistage stratified cluster sampling technique was adopted for the selection of areas and households for the study. The details of the survey procedures and the questionnaires used can be found in the final report [9].

The study included all the survey participants (25062) and the main dependent variable of the study was the history of ever spontaneous abortion or miscarriage among the study participants. The independent variables included demographic characteristics, mass media exposure, history of first sexual intercourse and history of first union.

2.1. Statistical Analysis

Statistical analysis was accomplished by using SPSS

version 20. Categorical variables results were presented using frequencies and percentages using tables and figures. Continuous variables were presented using means, median, and modes. The association between dependent and independent variables was done using chi-square. Statistical significance was set at a p-value of < 0.05.

2.2. Ethical Consideration

The ICF Institutional Review Board (IRB) approved the protocol for the use of the 2017 GMHS dataset for this study. Ethical approval was not necessary for this study because it involved a secondary analysis of a dataset without exposure to the identity of the respondents and their households. Nonetheless, permission was obtained from ICF through the DHS program for the use of the datasets in this study and the terms of data use were observed.

3. Results

3.1. Demographic Characteristics of the Respondents'

There were 25062 respondents (women aged from 15 to 49 years) in this survey; the average age of the women was 29.5±9.8, with a modal age of 15. The majority (74.0%) of the respondents were educated with at least primary level education. In terms of ethnicity majority (35.3%) were Akan and then 30.5% for Mole-Dagbani. At the time of the survey majority of the respondents were married (43.4%). The religion that dominated the respondents was Christianity (70.8%) than Islam (24.3%) and residency was almost the same for Urban and Rural, 50.1%, and 49.9% respectively. The study was across the then ten regions of Ghana, 31.7% for coastal belt (Western (9.3%), Central (6.4%) Greater (10.1%) and Volta (5.8%)), 30.4% for the forest belt (Eastern (8.7%), Ashanti (12.5%) and Brong Ahafo (9.2%)) and 38.0% for the savanna belt (Northern (16.8%), Upper West (10.8%) and Upper East (10.4%)) (Table 1).

About 85.4% of the respondents had a history of sexual intercourse and the mean age for first sexual intercourse was 17.4±3.0 years. The modal age of first sexual intercourse was 18.0 years, with minimum and maximum age of 7 and 49 years respectively. With a union, the average first age for the union was 20.0±4.8 years, and the modal first age for the first union being 17 years. The minimum and maximum age for the first union was 10 and 47 years respectively.

3.2. Respondents' Use of Modern Technology

The majority of them listens to the radio and watches television at least once a week (46.0% and 52.1% respectively). With ownership mobile, the majorities (64.3%) were having a mobile phone and about 62.7% of the respondents were having using the internet almost every day.

Table 1. Demographic characteristics of the respondents'.

		Frequency (n=25062)	Percentage
Age group	15-19	4888	19.5%
	20-24	4259	17.0%
	25-29	4179	16.7%
	30-34	3628	14.5%
	35-39	3262	13.0%
	40-44	2448	9.8%
	45-49	2398	9.6%
Marital status	Yes, married	10869	43.4%
	Yes, living with a man	4183	16.7%
	No	10010	39.9%
Ever attended school	Yes	18554	74.0%
	No	6508	26.0%
Ethnicity	Akan	8837	35.3%
	Ga/dangme	1279	5.1%
	Ewe	2474	9.9%
	Guan	905	3.6%
	Mole-dagbani	7651	30.5%
	Grusi	1284	5.1%
	Gurma	1799	7.2%
	Mande	293	1.2%
	Other	540	2.2%
	Religion	Christianity	17751
Islam		6080	24.3%
Traditional		617	2.5%
Other religion		3	0.0%
No religion		611	2.4%
Type of place of residence	Urban	12544	50.1%
	Rural	12518	49.9%
Regional belt	Coastal belt	7938	31.7%
	Forest belt	7610	30.4%
	Savanna belt	9514	38.0%

Source: GMHS, 2017.

3.3. Spontaneous Abortion (Miscarriage) in Ghana

The prevalence of Spontaneous abortion history (ever had a miscarriage) among the respondents was 15.6%. 2977 of them had a history of one miscarriage, 653 of them had two miscarriages, 193 of them had three miscarriages, 60 of them had four miscarriages, 20 of them had five miscarriages, 4 of them had six miscarriages and only 3 had a history of seven miscarriages.

3.4. Association Between Respondents' Demographic Characteristics and Their History of Miscarriage

Chi-square analysis revealed significant relation between miscarriage and the following demographic factors: age of the woman $X^2 (6, 25062)=1853.557$, $P \leq 0.001$, educational status $X^2 (1, 25062)=76.755$, $P \leq 0.001$, marital status $X^2 (2,$

$25062)=967.688$, $P \leq 0.001$, place of residence $X^2 (1, 25062)=23.410$, $P \leq 0.001$, ethnicity $X^2 (8, 25062)=45.195$, $P \leq 0.001$ and Regional belt $X^2 (2, 25062)=49.005$, $P \leq 0.001$ (Table 2).

3.5. Association between Other Independent Variables and History of Miscarriage

Chi-square analysis revealed significant relation between miscarriage and the following independent variable: age of first union $X^2 (4, 25062)=67.199$, $P \leq 0.001$, abortion history $X^2 (1, 25062)=113.804$, $P \leq 0.001$, exposure to radio $X^2 (1, 25062)=63.424$, $P \leq 0.001$, exposure to TV $X^2 (1, 25062)=16.403$, $P \leq 0.001$, exposure to mobile $X^2 (1, 25062)=190.179$, $P \leq 0.001$ and exposure to internet $X^2 (1, 25062)=44.528$, $P \leq 0.001$ (Table 3).

Table 2. Chi-square analysis of respondents' demographic characteristics and their history of marriage.

		Ever had miscarriage		X ²	df	P-value		
		Yes	No					
Age of the respondent	15-19	50	1.0%	4838	99.0%	1853.557	6	.000
	20-24	311	7.3%	3948	92.7%			
	25-29	654	15.6%	3525	84.4%			
	30-34	722	19.9%	2906	80.1%			
	35-39	812	24.9%	2450	75.1%			
	40-44	711	29.0%	1737	71.0%			
Ever attended school	45-49	650	27.1%	1748	72.9%	76.755	1	.000
	Yes	2674	14.4%	15880	85.6%			
Religion ³	No	1236	19.0%	5272	81.0%	8.225	3	.042
	Christianity	2704	15.2%	15047	84.8%			
	Islam	1019	16.8%	5061	83.2%			
	Traditional	95	15.4%	522	84.6%			
Have ever been married or lived with a man	No religion	92	15.0%	522	85.0%	967.88	2	.000
	Married	317	24.8%	959	75.2%			
Type of place of residence	Co-habitation	140	17.5%	658	82.5%	23.410	1	.000
	No	236	3.0%	7700	97.0%			
	Urban	2096	16.7%	10448	83.3%			
Ethnicity	Rural	1814	14.5%	10704	85.5%	45.195	8	.000
	Akan	1477	16.7%	7360	83.3%			
	Ga/dangme	186	14.5%	1093	85.5%			
	Ewe	414	16.7%	2060	83.3%			
	Guan	153	16.9%	752	83.1%			
	Mole-dagbani	1134	14.8%	6517	85.2%			
	Grusi	165	12.9%	1119	87.1%			
	Gurma	223	12.4%	1576	87.6%			
Mande	54	18.4%	239	81.6%				
Regional belt	Other	104	19.3%	436	80.7%	49.005	2	.000
	Coastal belt	1293	16.3%	6645	83.7%			
	Forest belt	1321	17.4%	6289	82.6%			
	Savanna belt	1296	13.6%	8218	86.4%			

Source: GMHS, 2017.

Table 3. Chi-square analysis other independent variables and history of miscarriage.

		Ever had miscarriage		X ²	df	P-value		
		Yes	No					
Age of first union	7-14	372	21.8%	1331	78.2%	67.199	4	.000
	15-19	1441	19.7%	5859	80.3%			
	20-24	1136	21.2%	4215	78.8%			
	25-29	511	24.3%	1592	75.7%			
	≥30 years	214	32.0%	455	68.0%			
Age of first sex	7-14	0	0.0%	0	0.0%	1.668	3	.644
	15-19	2579	18.1%	11702	81.9%			
	20-24	716	18.4%	3181	81.6%			
	25-29	90	18.7%	391	81.3%			
	≥30 years	15	23.8%	48	76.2%			
Ever had abortion	Yes	795	21.5%	2907	78.5%	113.804	1	.000
	No	3115	14.6%	18245	85.4%			
Listens to radio	Yes	2989	16.8%	14841	83.2%	63.424	1	.000
	No	921	12.7%	6311	87.3%			
watches TV	Yes	2880	16.2%	14903	83.8%	16.403	1	.000
	No	1030	14.2%	6249	85.8%			
Own a mobile phone	Yes	2894	18.0%	13223	82.0%	190.179	1	.000
	No	1016	11.4%	7929	88.6%			
Ever used internet	Yes	658	12.6%	4557	87.4%	44.528	1	.000
	No	3252	16.4%	16595	83.6%			

Source: GMHS, 2017

4. Discussion

The main purpose of this study was to find factors associated with induced abortion in Ghana among women.

According to the Guttmacher Institute, 23% of all pregnancies in Ghana for the year 2017 ended in abortion [10]. From this study prevalence of Spontaneous abortion history (ever had a miscarriage) among the respondents was 15.6%. 2977 of them had a history of one miscarriage, 653 of

them had two miscarriages, 193 of them had three miscarriages, 60 of them had four miscarriages, 20 of them had five miscarriages, 4 of them had six miscarriages and only 3 had a history of seven miscarriages. The prevalence of 15.6% for miscarriage reported in this study is in line with literature that approximately 10-20% of all pregnancies end as spontaneously before delivery [1, 3]. However, this is lower when compared with results from national study from Nepal [14].

Chi-square analysis revealed a significant relationship between miscarriage and age of the woman, the rate of miscarriage was high with the higher age groups. This is in line with the literature; the risk of miscarriage is reported 15.0% for those under 35 years, 20.0 – 35.0% for those between 35.0 – 45.0 years, and 50.0% for those over 45 years [6].

Educational status was related to miscarriage, the rate of miscarriage was proportionally high among those without education. Miscarriage was proportionally high among those with education as compared to those with zero education status. This study result is not in line with a similar study in China, which indicated that a high educational level was related to decrease the risk of spontaneous abortion [8].

Also, marital status had significant relation with spontaneous abortion; miscarriage was proportionally high among those in marriage relation as compared to those out of marriage relationship. This finding is contrary to a studies results which indicated that the odds of miscarriage were associated with increased if the woman was unmarried [11, 15].

Additionally, place of residence was associated with miscarriages; miscarriages were reported proportionally higher among urban dwellers as compare to rural dwellers. This study results disagree with a study in China, which indicated that rural women were about twice more likely to suffer spontaneous abortion than those in urban [8].

Finally on demographic characteristics and miscarriage association, there was significant relationship between Ethnicity and miscarriage. Miscarriages were reported proportionally higher among tribes in the forest belt. This study result is confirmed by the result of a similar study, also reported an association between ethnicity and spontaneous abortion [12].

Chi-square analysis further revealed significant relationships between miscarriage and other studied independent variables. First, age of first union was associated with miscarriage. Miscarriages were proportionally higher among those with higher ages (≥ 30) before the first union and this confirms the fact that higher maternal age is associated with a high rate of miscarriage. This is true when compared to literature that, the risk of miscarriage is reported 15.0% for those less than 35 years, 20.0 – 35.0% for those between 35.0 – 45.0 years, and 50.0% for those over 45 years [6].

Also, this study revealed that those with abortion history proportionally recorded a higher rate of miscarriage and this confirms the literature that, women who experience a single abortion in pregnancy during the first trimester are 30 percent more possible to face complications in a future pregnancy,

than women who have not experienced abortion [5].

Finally, in this current study, women with exposure to radio, TV, and mobile reported proportionally higher rates of miscarriages as compared to those without exposure. This confirms this study finding that miscarriages are proportionally high among those residents in urban areas since those in urban areas have access to these facilities compared to those in rural areas. Also, study results suggested that the use of the mobile phone can be associated with early spontaneous abortion [13].

5. Limitation

This study is not without limits, the study was unable to explore all factors known to be associated with spontaneous abortion. Moreover, the data employed for this study was a cross-sectional study that has to do with the remembrance of information from the past, and recall bias was more likely, especially with regards to questions on spontaneous abortion for non-married women.

6. Conclusion

Almost all understudied maternal socio-demographic variables were significantly associated with spontaneous abortion in Ghana. Health educational programs on family planning services and abortion care should be target towards groups identified in this study to be associated with spontaneous abortion.

Data Availability

All dataset related to the findings of this study is available online at www.dhsprogram.com.

Conflicts of Interest

There is no conflict of interest with this submission.

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