



Demographic Precursors of Spontaneous Abortion and Preventive Strategies among Childbearing Mothers in Owerri Senatorial Zone, Imo State, Nigeria

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ABSTRACT

The study investigated demographic precursors of spontaneous abortion and preventive strategies among childbearing mothers in Owerri Senatorial Zone, Imo State, Nigeria. Five research questions and three null hypotheses guided the study. The correlational research design was adopted for the study. The sample was 520 childbearing mothers (CBMs) drawn randomly from a population of 742,576 CBMs in Owerri Senatorial Zone, Imo State. Researchers'-structured Demographic Precursors of Spontaneous Abortion Questionnaire (DPSAQ) was used for data collection. Percentages were used to answer research questions one and five, phi (ϕ) correlation coefficient was used to answer research questions 2-4 while Chi-square (χ^2) statistic was used to test the null hypotheses at .05 level of significance. The results among others indicated that CBMs had spontaneous abortion (32.2%). Level of education was significantly associated with spontaneous abortion. Age and parity were not significantly associated with spontaneous abortion among CBMs. Based on these findings; spontaneous abortion preventive strategies were formulated and adjudged appropriate by experts. Among the preventive strategies were health education of mothers on the danger signs of spontaneous abortion, such as: vaginal bleeding, abdominal pain and back pain, provision of pregnancy counseling to women that had spontaneous abortion in the past, and providing community health education to positively influence the knowledge of pregnant women towards PRCs such as spontaneous abortion using seminar, conferences, and health talks. The authors recommended among others that health educators should adopt appropriate preventive strategies to intensify awareness in order to reduce pregnancy-related complications and other maternal health problems.

Keywords: Spontaneous Abortion, Demographic, Precursors, Preventive Strategies, Childbearing Mothers.

INTRODUCTION

Spontaneous abortion is a significant public health and clinical problem that complicates pregnancies among women of reproductive age both in the developed and developing countries. It is a potentially life-threatening situation and a serious life event that occurs during early pregnancy. Spontaneous abortion affects women in their reproductive years' world over, especially in the developing countries, including Nigeria. Every year, approximately 12–15 per cent of recognized pregnancies and 17–22 per cent of all pregnancies end in spontaneous abortion (Weintraub and Sheiner, 2011). Houry and Keadey (2007) reported that approximately 20-25 per cent of pregnant women experience some bleeding during their pregnancies. The authors stressed that it is widely estimated that almost half of all females who have bleeding during early pregnancy miscarry. Furthermore, the authors explained that about 80 per cent of spontaneous abortion occurs during the first trimester and the rest before 20 weeks of gestation. However, the frequency of its occurrence decreases with increasing gestational age (Regain and Rai, 2000).

Spontaneous abortion refers to early bleeding in pregnancy that occurs without any external or intentional physical influence. Lena (2006) defined spontaneous abortion as an involuntary loss of an intrauterine pregnancy before 28 completed weeks of gestation in which the foetus is dead when expelled. This implies that it occurs without intervention from the woman or another. Contextually, spontaneous abortion refers to the natural

death of an embryo or foetus before it is able to survive independently among CBMs in Owerri senatorial zone.

Many factors have been adduced to be associated with spontaneous abortion. The most common risk factors include: chromosomal abnormalities, exposure to illicit drugs, smoking, alcohol use, obesity, maternal disease (such as malaria, diabetes, infections etc.), faulty implantation of the embryo, severe nutritional deficiencies, and immune dysfunction, uterine malformation or fibroid and untreated thyroid disease, maternal age, trauma, radiation exposure, excessive caffeine, and previous spontaneous abortions (Regain and Rai, 2000; Lena, 2006; Houry and Keadey 2007; Weintraub and Sheiner, 2011; Umar *et al.*, 2014; Bethany, 2014; Alison, 2015). Weintraub and Sheiner (2011) submitted that chromosomal abnormalities account for more than 50-70 per cent of spontaneous abortion cases while placental anatomical abnormalities are found in as many as two-thirds of early pregnancy failure.

Clinically, spontaneous abortion takes different forms namely: threatened abortion, inevitable, incomplete, complete, missed, recurrent and septic abortions. Threatened abortion could be any vaginal bleeding during early pregnancy without cervical dilation or change in cervical consistency (Weintraub, and Sheiner, 2011; Bethany, 2014; Umar *et al.*, 2014). The bleeding is often painless, although, it may be accompanied by mild suprapubic pain. The pregnancy may be at the risk of being terminated, but in more than half of the cases, it can be saved (Alison, 2015). Inevitable abortion occurs when amniotic

membranes rupture and the cervix dilates (Bethany, 2014). The cervical Os at this stage is open and the gestational tissue can often be felt or visualized through the internal cervical Os (Weintraub and Sheiner, 2011). The woman may report of abdominal or back pain, bleeding and sometimes a gush of fluid from the vagina. Often there is no bleeding but occasionally, the woman may notice a dark brown vaginal discharge. Pain is unlikely to occur and the cervix will be closed. Furthermore, conditions may be such that the pregnancy cannot be saved and products of conception are commonly expelled without intervention. An inevitable abortion will either progress to an incomplete or complete abortion. An incomplete abortion is a form of spontaneous abortion that occurs when some but not all of the products of conception are expelled and cramps are also present. Umar *et la.* (2011) affirmed that incomplete abortion is a pregnancy that is associated with vaginal bleeding, dilation of the cervical canal and passage of products of conception. The retained products, which in most cases is the placenta prevents the uterus from contracting completely which results in bleeding from the uterine blood vessels (Bethany, 2014).

Complete abortion, on the other hand, occurs when all the products of conception are lost. Bethany (2014) opined that complete abortion occurs when all the products of conception, including the foetus and placenta, are expelled from the uterus. It is characterized by heavy vaginal bleeding, severe abdominal pain and passage of pregnancy tissue. In most cases, complete abortion occurs early in pregnancy and nature completes the process without incident. Weintraub and Sheiner (2011) stated that if a complete abortion occurs, the uterus will be small and well contrasted with a closed cervix and slight vaginal bleeding and mild cramping can be present. Missed abortion is another form of spontaneous abortion that occurs when the products of conception are retained in utero after the foetus has died. It is the utero death of the embryo or foetus prior to the 20th week of gestation, with prolonged retention of the pregnancy (Weintraub and Sheiner, 2011). Septic abortion is an abortion that occurs when infection invades the uterine cavity during the abortion process. It may occur after attempts by an unqualified individual to end a pregnancy.

Spontaneous abortion presents itself in different ways, depending on the stage of pregnancy. The most common symptom is vaginal bleeding which can range from light spotting to heavy flow. The blood may contain clots or other tissues. Other common warning signs are mild or severe back pain, severe abdominal pain, heavy spotting, fever, chills, foul-smelling vaginal discharge, persistent vaginal bleeding, malaise and abdominal cramping (Edward, 2003; Weintraub and Sheiner, 2011; Bethany, 2014; Alison, 2010). Spontaneous abortion is also associated with complications such as sadness, anxiety, guilt, increased risk of preterm delivery in subsequent pregnancies and infertility (Weintraub and Sheiner, 2011). The authors further explained that many women may have concerns regarding the possibility of another loss in a future pregnancy which in most cases have been estimated to be about 20 per cent after one miscarriage, 28 per cent after two miscarriages, and 43 per cent after three or more miscarriages. The aforementioned signs of spontaneous abortion may be associated with some factors. The factors are also known as precursors.

Precursor refers to anything that influences the occurrence of something. Contextually, precursor refers to those factors that influence the occurrence of spontaneous abortion among CBMs in Owerri senatorial zone. Precursors of spontaneous abortion could be clinical, sub-clinical, demographic or otherwise. However, this study focused on demographic precursors of spontaneous abortion among CBMs. Demographic refers to characteristics of CBMs that is capable of influencing or causing the occurrence of spontaneous abortion. The demographic variables of interest are age, level of education and parity. Age of a woman at pregnancy is known as the most important factor that has an undeniable effect on the pregnancy process (Aghamohammadi and Nooritager, 2011). This is because age determines the readiness of a woman's body physiology. Studies have indicated that the occurrence of spontaneous abortion increases with age (Banerjee and Hazra, 2004; Weintraub and Sheiner, 2011; Umar *et la.*, 2014). Level of education of mothers is another significant variable that is associated with spontaneous abortion. Maternal education has been found to relate positively to the utilization of maternal health care services (Addai, 2000; Celik and Hotchkiss, 2000; Surendra *et la.*, 2006). Various studies have indicated that parity is a risk factor for pregnancy complications such as spontaneous abortion, with the risk being more among women with more than five children (Munim *et la.*, 2000; Umar *et la.*, 2014). Spontaneous abortion can be effectively controlled using adequate preventive strategies, thereby decreasing the associated risks.

Prevention can be achieved by designing activities that will reduce the chances of something bad happening. Preventive strategies can be achieved through modification or removal of risk factors for a disease or any health condition. Contextually, preventive strategies refer to the plan of actions applied to limit the occurrence of spontaneous abortion among CBMs. Carp *et la.* (2012) indicated that the prevention of spontaneous abortion is possible through good prenatal care. Prenatal care involves a series of assessments and appropriate treatments consisting of monitoring the health status of the woman, provision of medical and psychological interventions and support as well as health promotion. The primary aim is to protect the health of mothers and their babies during pregnancy so as to achieve at the end of the pregnancy, a healthy mother and a healthy baby. These can be achieved through early, accurate estimation of gestational age, identification of patients at risk for complication, ongoing evaluation of both mother and foetus as well as anticipation of problems and intervention if possible to prevent or minimize mortality (Charles and Urania, 2016). Early detection and appropriate management of health problems, such as spontaneous abortion help to preserve the wellbeing of both the mother and the baby. With regular antenatal care, health care providers can spot health problems early (Mark *et la.*, 2015). It also allows for early treatment which can cure many problems and prevent others. Despite the measures put in place to avert complications resulting from pregnancy, the problem seems to have remained prevalent in Owerri senatorial zone of Imo State, Nigeria, as mothers still experience complications during pregnancy such as spontaneous abortion, thereby resulting to maternal death sometimes. Also, a literature review has not shown any published work on demographic precursors of spontaneous abortion among childbearing mothers in Owerri

senatorial zone. This, therefore, necessitated the study in the area.

Objectives of the Study

The purpose of the study was to investigate demographic precursors of spontaneous abortion among childbearing mothers in Owerri Senatorial Zone of Imo State, Nigeria. Specifically, the study determined:

- 1) the proportion of CBMs that experienced spontaneous abortion in the past 12 months;
- 2) relationship between spontaneous abortion and age of CBMs;
- 3) relationship between spontaneous abortion and level of education of CBMs;
- 4) relationship between spontaneous abortion and parity of CBMs; and
- 5) appropriate preventive strategies for spontaneous abortion experience of CBMs.

Research Questions

Five research questions guided the study.

- 1) What is the proportion of CBMs that experienced spontaneous abortion in the past 12 months?
- 2) What is the relationship between spontaneous abortion and age of CBMs?
- 3) What is the relationship between spontaneous abortion and the level of education of CBMs?
- 4) What is the relationship between spontaneous abortion and parity of CBMs?
- 5) What are the appropriate preventive strategies for spontaneous abortion experience of CBMs?

Hypotheses

Three null hypotheses guided the study.

- 1) Age is not significantly associated with spontaneous abortion experience of CBMs in Owerri senatorial zone of Imo State ($p < .05$).
- 2) Education level is not significantly associated with spontaneous abortion experience of CBMs in Owerri senatorial zone of Imo State ($p < .05$).
- 3) Parity is not significantly associated with spontaneous abortion experience of CBMs in Owerri senatorial zone of Imo State ($p < .05$).

METHODOLOGY

Design of the Study

The study adopted a correlational research design. Correlational research design establishes a relationship between two or more variables.

Area of the Study

The study was conducted in Owerri senatorial zone of Imo State. Owerri senatorial zone is one of the senatorial zones in Imo State and shares common boundaries with Orlu, Obowo, Isu, Ohaji Egbema, Okigwe, Ihitte Uboma and Isiala Mbano Local Government Area, all of which are in Okigwe and Orlu senatorial zones. The senatorial zone is made up of nine local government areas: Aboh Mbaise, Ahiazu Mbaise, Ezinihitte Mbaise, Ikeduru, Mbaitoli, Ngor-Okpala, Owerri North, Owerri West and Owerri Municipal. The researchers observed that most mothers in the senatorial zone do not easily access and utilize health care services because of their high cost, thus predisposing

them to pregnancy-related complication such as spontaneous abortion. Some cultural practices inherent in the senatorial district such as lack of interest in antenatal care, and belief in traditional medicine and self-medication were also observed by the researchers to have been predisposing CBMs in the senatorial district to spontaneous abortion. Thus, the researchers deemed the area appropriate for the study.

Population for the Study

The population for the study comprised CBMs from the nine LGAs that make up Owerri Senatorial Zone, which is estimated to be 742,576 (National Population Commission [NPC], 2017).

Sample for the Study

The sample for the study consisted of 520 CBMs living in Owerri senatorial zone, Imo State. The sample was selected by the aid of Cohen, Manion, and Morrison (2011) standardized sample table. The multi-stage sampling procedure was employed to draw the sample size for the study. In the first stage, 4 out of the 9 LGAs in the senatorial zone were drawn using simple random sampling technique of balloting without replacement. Secondly, 5 communities each were drawn from the 4 selected LGAs using simple random sampling technique of balloting without replacement, and this gave a total of 20 communities. Thirdly, 26 CBMs with greater experience were purposively drawn from each of the 20 selected communities to arrive at the sample size of 520. Twenty experts made up of doctors, nurses, midwives and other health professionals with in-depth knowledge of spontaneous abortion were purposively drawn to determine the appropriateness of the preventive strategies for spontaneous abortion. The purposive sampling technique was used to draw 20 experts that validated the preventive strategies formulated.

An instrument for Data Collection

Researchers' structured Demographic Precursors of Spontaneous Abortion Questionnaire (DPSAQ) and Preventive Strategies for Spontaneous Abortion Questionnaire (PSSAQ) were used for data collection. The DPSAQ consisted of two sections: A and B. Section A consisted of three items on the respondent's demographic variables of age, level of education and parity. Section B consisted of six items on spontaneous abortion. The PSSAQ was structured based on the baseline data. It was in a tabular form and comprised the baseline data (major findings), objectives; preventive strategies formulated and polychotomous response options of Very Appropriate, Appropriate, Inappropriate and Very Inappropriate. Five experts validated the instrument. Three came from the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka; and two came from the Department of Health Education, Alvan Ikoku Federal College of Education, Owerri, Imo State. Split-half method and Spearman's Brown Correction Formula was used to compute the reliability of the instrument, and a reliability index of .86 was obtained. This was adjudged reliable for the study.

Data Collection Technique

Copies of the questionnaire were administered to 520 CBMs, out of which 500 were returned, which gave a return rate of 96.2 per cent. The 500 copies of the questionnaire returned were properly filled out and used for data analysis. Copies of PSSAQ were

administered to 20 experts that adjudged the preventive strategies formulated based on the baseline data appropriate.

Data Analysis Technique

Data generated were analysed using frequency counts, percentages, phi (ϕ) correlation coefficient and Chi-square statistic. Research questions one and five were answered using percentages, research questions 2 to 4 were answered using phi (ϕ) correlation coefficient while the null hypotheses were tested using Chi-square (χ^2) at .05 level of significance. In determining the relationships, Jackson (2009) estimates for weak, moderate and strong correlation coefficients, $\pm.00 - .29$ was interpreted as none (.00) to a weak relationship (NR or WR), $\pm.30 - .59$ was interpreted as moderate relationship (MR), and $\pm.60 - 1.00$ was interpreted as strong relationship (SR). The criterion for deciding an appropriate or inappropriate preventive strategy was based on WHO (1997) international cut off point of

50 per cent. Therefore, preventive strategies that had less than 50 per cent were deemed inappropriate while those that had 50 per cent and above were deemed appropriate.

RESULTS

As shown in Table 1, the final sample was 500. The vast majority of the respondents 376 (75.2%) were aged between 25 – 44 years. Majority of the respondents had attained at least secondary education 415 (73%). Majority of respondents 355 (71.0%) had given birth to 1 – 4 children.

Results in Table 2 showed that overall, 32.2% of CBMs had experienced spontaneous abortion in Owerri Senatorial zone, Imo State. Specifically, 40.6% CBMs had severe back pain, 38.8% had severe abdominal pain and 36.0% had vaginal bleeding which may range from high spotting to heavy flow among others.

Table 1: Frequency Table of Demographic Characteristics of Respondents (n = 500)

Variable	F	%
Age		
15 – 24 years	79	15.8
25 – 34 years	214	42.8
35 – 44 years	162	32.4
45 years and above	45	9.0
Level of Education		
Primary education	85	17.0
Secondary education	143	28.6
Tertiary education	272	54.4
Parity		
1 – 4 children	355	71.0
5 children and above	145	29.0

Table 2: Proportion of Childbearing Mothers that have Experienced Spontaneous Abortion (n = 500)

S/N	Spontaneous abortion	Yes f(%)	No f(%)
1.	Vaginal bleeding which may range from light spotting to heavy flow	180(36.0%)	320(64.0%)
2.	Severe abdominal pain	194(38.8%)	306(61.2%)
3.	Heavy spotting	126(25.2%)	374(74.8%)
4.	Persistent Vaginal bleeding	116(23.2%)	384(76.8%)
5.	Severe back pain	203(40.6%)	297(59.4%)
6.	Vaginal discharge that has an offensive odour	146(29.2%)	354(70.8%)
Cluster Percentage (%)		32.2	67.8

Results in Table 3 showed that there was a weak positive relationship ($\phi = .113$) between spontaneous abortion and age of CBMs in Owerri Senatorial Zone. Results in Table 4 showed that there was a weak positive relationship ($\phi = .205$) between Results in Table 6 showed that overall, a vast majority (96.9%) of the experts adjudged the formulated preventive strategies for spontaneous abortion appropriate.

spontaneous abortion and level of education of CBMs in Owerri Senatorial Zone. Results in Table 5 showed that there was a weak positive relationship ($\phi = .031$) between spontaneous abortion and parity of CBMs in Owerri Senatorial Zone.

Table 3: Relationship between Spontaneous Abortion and Age of CBMs (n = 500)

S/N	Spontaneous abortion	ϕ	Dec.
1.	Vaginal bleeding which may range from light spotting to heavy flow	.101	WR
2.	Severe abdominal pain	.067	WR
3.	Heavy spotting	.103	WR
4.	Persistent Vaginal bleeding	.155	WR
5.	Severe back pain	.092	WR
6.	Vaginal discharge that has an offensive odour	.106	WR
	Cluster value	.113	WR

Key: $\pm .00 - .29$ = None (.00) to Weak Relationship (NR or WR) ; $\pm .30 - .59$ = Moderate Relationship (MR)
 $\pm .60 - 1.00$ = Strong Relationship (SR)

Table 4: Relationship between Spontaneous Abortion and Level of Education of CBMs (n = 500)

S/N	Spontaneous abortion	ϕ	Dec.
1.	Vaginal bleeding which may range from light spotting to heavy flow	.193	WR
2.	Severe abdominal pain	.092	WR
3.	Heavy spotting	.162	WR
4.	Persistent Vaginal bleeding	.054	WR
5.	Severe back pain	.055	WR
6.	Vaginal discharge that has an offensive odour	.042	WR
	Cluster value	.205	WR

Table 5: Relationship between Spontaneous Abortion and Parity of CBMs (n = 500)

S/N	Spontaneous abortion	ϕ	Dec.
1.	Vaginal bleeding which may range from light spotting to heavy flow	.007	WR
2.	Severe abdominal pain	-.020	WR
3.	Heavy spotting	.055	WR
4.	Persistent Vaginal bleeding	.035	WR
5.	Severe back pain	.037	WR
6.	Vaginal discharge that has an offensive odour	-.042	WR
	Cluster value	.031	WR

Data in Table 7 showed the Chi-square (χ^2) test of no significant association between spontaneous abortion and age. The chi-square test of independence shows that there was no significant association ($\chi^2 = 6.361$, $df = 3$, $p\text{-value} = .095 > .05$) between spontaneous abortion and age. The null hypothesis of no

Result in Table 8 showed the Chi-square (χ^2) test of no significant association between spontaneous abortion and level of education. The chi-square test of independence shows that there was a significant association ($\chi^2 = 21.054$, $df = 2$, $p\text{-value} = .000 < .05$) between spontaneous abortion and level of education of mothers. The null hypothesis of no significant association was rejected since the p-value was less than .05 level of significance at 2 degrees of freedom. This implies that the level of education was significantly associated with spontaneous abortion.

significant association was not rejected since the p-value was greater than 0.05 level of significance at 3 degrees of freedom. This implies that age was not significantly associated with spontaneous abortion.

Result in Table 9 showed the Chi-square (χ^2) test of no significant association between spontaneous abortion and parity. The chi-square test of independence shows that there was no significant association ($\chi^2 = .468$, $df = 1$, $p\text{-value} = .494 > .05$) between spontaneous abortion and parity. The null hypothesis of no significant association was not rejected since the p-value was greater than .05 level of significance at 1 degree of freedom. This implies that parity was not significantly associated with spontaneous abortion.

Table 6: Responses of Experts on Preventive Strategies for Spontaneous Abortion (n=20)

S/N	Preventive Strategies	F	%	Dec.
1.	Health education of mothers on the danger signs of Spontaneous abortion such as vaginal bleeding, abdominal pain and back pain.	20	100.0	A
2.	Providing community health education to positively influence the knowledge of pregnant women towards PRCs such as spontaneous abortion using seminar, conferences, and health talks.	20	100.0	A
3.	Provision of pregnancy counselling to women that had a spontaneous abortion in the past.	20	100.0	A
4.	Taking enough fruit, vegetables, proteins, vitamins, and carbohydrates in the right proportion daily.	18	90.0	A
5.	Taking a family history of pregnant mothers to guide them.	20	100.0	A
6.	Proper counselling on comprehensive knowledge of pregnancy-related complication to mothers by health professionals	20	100.0	A
7.	Health Education of mothers on important areas such as nutrition and travel during pregnancy	19	95.0	A
8.	Making Omega-3 fatty acid an integral part of the menu for pregnant mothers	18	90.0	A
Overall Percentage (%)			96.9	

Key: 0 – 49% = Inappropriate; 50 – 100% = Appropriate

Table 7: Chi-square Analysis of the Association between Spontaneous Abortion and Age

Variable	N	Yes O(E)	No O(E)	χ^2	df	p-value
Age						
15 – 24 yrs	79	30(26.5)	49(52.5)	6.361	3	.095
25 – 34 yrs	214	79(71.9)	135(14.2)			
35 – 44 yrs	162	42(54.4)	120(107.6)			
45 yrs and above	45	17(15.1)	28(29.6)			

* significant (p<.05) O = Observed frequency; E = Expected frequency; df = Degree of freedom

Table 8: Chi-square Analysis of the Association between Spontaneous Abortion and Level of Education

Variable	N	Yes O(E)	No O(E)	χ^2	df	p-value
Level of Education						
Primary Education	85	31(28.6)	54(56.4)	21.054	2	.000*
Secondary Education	143	68(48.0)	75(95.0)			
Tertiary Education	272	69(91.4)	203(180.6)			

* significant (p<.05)

Table 9: Chi-square Analysis of the Association between Spontaneous Abortion and Parity

Variable	N	Yes O(E)	No O(E)	χ^2	Df	p-value
Parity						
1–4 Children	355	116(119.3)	239(235.7)	.468	1	.494
5 Children and above	145	52(48.7)	93(96.3)			

* significant ($p < .05$)

DISCUSSION

The findings of the study showed that overall, less than half of CBMs experienced spontaneous abortion. The findings were expected and therefore not surprising because studies have shown that spontaneous abortion is a common complication of pregnancies that affects women world over. The findings agree with Houry and Keadey (2007) who reported that approximately 20-25 per cent of pregnant women experience some bleeding during their pregnancies. Furthermore, the authors stressed that it is widely estimated that almost half of all females who have bleeding during early pregnancy miscarry. The findings were in line with the findings of WHO (2009) who reported that every year, more than 20 million women experience ill-health as a result of pregnancy globally. The findings also agree with Weintraub and Sheiner (2011) who reported that spontaneous abortion is among the most common complications of early pregnancy, affecting approximately 12–15 per cent of recognized pregnancies and 17–22 per cent of all pregnancies annually. The finding has implications for government to collaborate with health programme planners to adopt the preventive strategies for spontaneous abortion formulated by this study for inclusion into maternal health programmes.

The findings showed that there was a very low positive relationship between spontaneous abortion and age. The study revealed that age was not significantly associated with spontaneous abortion. The findings were not expected and therefore surprising because appropriate age of conception by a woman determines pregnancy and birth outcomes. It has been discovered that the higher the age of a woman, the higher the rate of occurrence of spontaneous abortion. The findings were not in line with the finding of Banerjee and Hazra (2004) whose study revealed that pregnancy wastage was maximum in women above 35 years of age and minimum in women who are between 20-24 years. The finding was not in agreement with Weintraub and Sheiner (2011) who reported that the risk of spontaneous abortion was 8.9 per cent among women aged 20–24 years and 74.7 per cent among those aged 45 years. Similarly, there was a low positive relationship between spontaneous abortion and level of education. The finding showed that the level of education was significantly associated with spontaneous abortion. The findings were expected and therefore were not surprising because education has consistently been found to be associated with the use of maternal health care services. The higher a woman's level of education the more likely she is to utilize maternal health care services and to take better care of herself which consequently may improve her economic power and ensure a better social and legal status for her. The finding

was in line with the explanation of Addai (2000); Celik and Hotchkiss (2000) that maternal education relates positively to the utilization of maternal care services. Education exposes women to new ideas, information and to modern institutions. The findings agree with the finding of Banerjee and Hazra (2004) whose study revealed that pregnancy wastage among illiterate mothers was significantly higher than that in literate mothers.

The study also showed that there was a very low positive relationship between spontaneous abortion and parity and that parity was not significantly associated with spontaneous abortion. The findings were not expected and therefore surprising because it has consistently been discovered that pregnancies affect the muscles of the uterus. The higher the number of pregnancies a woman carries the more the muscles of the uterus will be affected. The finding was not in line with the findings of Munim, *et la.* (2000) who reported that pregnancy after five children is a risk factor for complications in pregnancy such as spontaneous even in the presence of reasonable antenatal care. The authors further explained that this may be explained as being caused by the muscles of the uterus due to previous pregnancies.

In this study, overall, the majority of the experts adjudged the formulated preventive strategies appropriate and the findings were expected and therefore not surprising. The findings were in line with the assertion of Michelle (2011) that exercise lowers the risk of pregnancy complications. The findings were consistent with the recommendation of Kooffreh, *et la.* (2014) that the utilization of antenatal care by women should be strengthened to enable early detection and management of pregnancy problems. The findings agree with the explanation of Mark *et la.* (2015) that with regular prenatal care, health providers can spot health problems early.

CONCLUSION

The study was conducted in order to determine the demographic precursors of spontaneous abortion and preventive strategies. The findings have shown that less than half of childbearing mothers in Owerri Senatorial Zone had experienced spontaneous abortion. There was a very low positive relationship between spontaneous abortion and the demographic variables of age and parity. Also, there was a low positive relationship between spontaneous abortion and level of education. Age and parity were not significantly associated with spontaneous abortion while the level of education was significantly associated with spontaneous abortion. The identified precursors of spontaneous

abortion underpin the need to go beyond services and primary prevention. Mitigating and possibly preventing spontaneous abortion requires the involvement of many sectors working together at community, national and international levels. At each level, intervention should include health education of mothers on the danger signs of Spontaneous abortion such as vaginal bleeding, abdominal pain and back pain, provision of pregnancy counseling to women that had spontaneous abortion in the past, and providing community health education to positively influence the knowledge of pregnant women towards PRCs such as spontaneous abortion using seminar, conferences, and health talks. The efforts made to provide interventions will help to mitigate and prevent the experience of spontaneous abortion among CBMs.

Recommendations

Based on the study and conclusions, the following recommendations were made:

- 1) Imo State government should collaborate with health programme planners to adopt the preventive strategies for spontaneous abortion formulated by this study for inclusion into maternal health programmes.
- 2) Health educators should adopt appropriate preventive strategies to intensify awareness in order to reduce pregnancy-related complications and other maternal health problems.

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