

Socio-demographic Correlates of Age and Educational background, and Preventive Strategies of Pregnancy related complications among Childbearing Mothers in Enugu State, Nigeria

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Abstract

This study examined the socio-demographic correlates of age and educational background, as well as preventive strategies for pregnancy-related complications among childbearing mothers in Enugu State, Nigeria. Three research questions and three hypotheses guided the study. A correlational research design was adopted. The population comprised 34,624 childbearing mothers registered in seven general hospitals in the State: Agbani, Awgu, Enugu-Ezike, Enugu Metropolis, Isi-Uzo, Nsukka, and Udi. A sample of 515 respondents was determined using the Taro Yamane formula. A multi-stage sampling procedure involving stratified and proportionate sampling techniques was employed. Data were collected using a researcher-designed 13-item questionnaire validated by three experts. Reliability was established using Cronbach's alpha, yielding a coefficient of 0.80, indicating acceptable internal consistency. The instrument was administered during antenatal clinic sessions with the assistance of five research assistants. Of the 515 questionnaires distributed, 431 (83.7%) were completed and returned for analysis. Data were analyzed using mean, standard deviation, and Pearson's Product Moment Correlation Coefficient, while hypotheses were tested using the t-test at a 0.05 level of significance. Findings revealed strong positive relationships between age and pregnancy-related complications ($r = .89$) and between educational background and pregnancy-related complications ($r = .83$). There was no significant difference in the mean responses of urban and rural respondents regarding preventive strategies for pregnancy-related complications ($p > .05$). The study concluded that age and educational level are significantly associated with pregnancy-related complications. It recommends intensified antenatal education on the risks of teenage and late pregnancies, regular antenatal care attendance, and educational materials to reinforce preventive strategies.

Keywords: demography, correlate, preventive strategies, pregnancy

INTRODUCTION

Pregnancy and childbirth are significant life events that mark important transitions in a woman's reproductive life and have profound implications for the health and well-being of the mother, child, and family. Pregnancy is defined as the period during which a fetus develops within a woman's uterus from fertilization until birth (Mbonu, 2018). Although pregnancy and childbirth are generally associated with joy and fulfillment, they may sometimes be accompanied by complications such as stillbirth, breech delivery, and other adverse maternal and fetal outcomes (Barber & East, 2009, cited in Chinawa et al., 2016). Consequently, ensuring safe pregnancy and childbirth remains a major public health priority.

The expectation of every pregnant woman is to experience a safe delivery and give birth to a healthy baby. However, in many societies, including traditional communities in Nigeria, pregnancy-related risks are often perceived as unavoidable aspects of the reproductive process (Anyichie & Nwagu, 2020). Similarly, Derricott (2014) observed that although pregnancy is generally a period of joy and well-being, complications may arise that threaten the lives of both the mother and the unborn child. The occurrence of pregnancy-related complications therefore constitutes a serious public health concern and underscores the need to identify effective preventive strategies among childbearing mothers.

Pregnancy-related complications refer to health conditions that occur during pregnancy and adversely affect maternal and fetal health. These complications may arise as a result of physical and mental conditions that affect the health of the pregnant woman, their baby or both. (CDC, 2024). Common pregnancy-related complications include hypertension, miscarriage, ectopic pregnancies, preeclampsia, preterm labour, and other obstetric emergencies (WHO, 2025). Early identification and prevention of these complications are essential for safeguarding maternal and neonatal health outcomes. In this regard, Sede & Rolle (2018) emphasized the importance of preparing for unexpected complications during pregnancy and the postpartum period. However, it remains unclear whether childbearing mothers in Enugu State possess adequate plans and strategies to address such complications, thereby necessitating the present study.

Maternal mortality resulting from pregnancy-related complications remains a major global health challenge. Reports by the World Health Organization (WHO, 2018; WHO, 2020) indicate that the burden of maternal deaths remains alarmingly high, particularly in developing countries. Approximately 400,000 women die annually from pregnancy-related complications, making maternal mortality a significant public health concern (WHO, 2020). Beyond the loss of life, maternal deaths impose substantial social, emotional, and economic burdens on families, communities, and nations. Childbearing mothers in Enugu State are not exempt from these challenges, highlighting the need to examine the preventive strategies they adopt to reduce pregnancy-related complications.

Preventive strategies are actions taken to prevent the occurrence of diseases or undesirable health outcomes (Ozor, 2017). In the context of maternal health, preventive strategies encompass interventions and behaviours that reduce the risk of pregnancy-related complications and promote safe motherhood. According to Johnson (2020), these strategies include adequate folic acid supplementation before and during pregnancy, receiving appropriate immunizations, maintaining a healthy diet and body weight, engaging in regular physical activity, avoiding tobacco, alcohol, and harmful drugs, and attending regular medical check-ups. Similarly, Cheptum et al. (2018) identified birth preparedness and regular antenatal care attendance as critical preventive measures. For the purpose of this study, preventive strategies were examined from the perspectives of antenatal care attendance and healthy lifestyle practices among childbearing mothers in Enugu State.

The adoption of preventive strategies may be influenced by various demographic factors. Demographic characteristics describe the attributes of individuals or populations and are often used to explain differences in health behaviours and outcomes. According to WHO (2017), factors such as age, educational level, marital status, income, employment status, parity, and religion can influence maternal health outcomes in developing countries. In Nigeria, demographic factors have been reported to play significant roles in determining pregnancy-related health outcomes among women (Omoruyi, 2018). However, this study focused specifically on age and educational

attainment as demographic correlates of pregnancy-related complications and preventive strategies.

Age is a critical determinant of maternal health because it influences biological, social, and behavioural factors associated with pregnancy outcomes. Eze (2018) defined age as the period of human life measured from birth and characterized by varying levels of physical and mental development. Studies have shown that maternal age significantly affects pregnancy experiences and outcomes (Londero et al., 2019). Muokwogwo (2012) reported that maternal age is a major factor influencing the risk of injury and mortality during pregnancy and childbirth, with adolescent mothers being particularly vulnerable due to limited knowledge and access to maternal health information. Consequently, this study examined pregnancy-related complications and preventive strategies among childbearing mothers aged 15–24 years, 25–34 years, 35–44 years, and 45 years and above.

Educational attainment is another important determinant of maternal health behaviour. Education enhances health literacy, improves access to information, and promotes informed decision-making regarding healthcare utilization. Ndu (2012) observed that education serves as a powerful instrument for positive behavioural change, while Azuh et al. (2017) argued that education influences health-seeking behaviour through multiple pathways. According to Elo (2012), educated women are more likely to possess greater health awareness, have better knowledge of available healthcare services, enjoy increased financial capacity to access healthcare, and demonstrate greater autonomy in making health-related decisions. These factors collectively improve the likelihood of utilizing maternal health services and adopting preventive measures against pregnancy-related complications. Despite these established relationships, limited evidence exists regarding the role of educational attainment in influencing preventive strategies among childbearing mothers in Enugu State.

Location may also influence maternal health behaviours and outcomes. According to Sinclair (cited in Oluka, 2014), location refers to the place where people reside or where activities occur. Urban areas are generally characterized by greater access to healthcare facilities, infrastructure, and health information, whereas rural areas often experience shortages of healthcare services and resources. These disparities may affect women's access to maternal healthcare and their adoption of preventive strategies against pregnancy-related complications. Therefore, this study also examined the relationship between residential location and pregnancy-related complications among childbearing mothers in Enugu State.

Although several initiatives have been implemented in Nigeria to improve maternal health outcomes, including the Free Maternal and Child Health Care (FMCHC) programme in Enugu State, maternal morbidity and mortality remain significant public health challenges. Persistent pregnancy-related complications continue to threaten the lives of mothers and infants despite these interventions. Inadequate adoption of preventive strategies may contribute to poor maternal and neonatal outcomes, increased healthcare costs, and adverse socioeconomic consequences. Therefore, there is a need to generate empirical evidence on the demographic factors associated with pregnancy-related complications and preventive practices among childbearing mothers.

Against this background, the present study investigated the demographic correlates of pregnancy-related complications and preventive strategies among childbearing mothers in Enugu State, Nigeria, with particular emphasis on age, educational attainment, and location.

METHODOLOGY

This was a correlational research design carried out in Enugu State south east geopolitical zone of Nigeria. The population for the study comprised all the 34,624 childbearing mothers in Enugu State who were registered with the seven general hospitals in the State namely Agbani, Awgu, Enugu-Ezike, Enugu metropolis, Isi-Uzo, Nsukka, and Udi respectively. A total of five hundred and fifteen (515) respondents determined using Taro Yamane formula served as respondents. On sampling techniques, multi-stage sampling procedure comprising two stages were used. In the first stage, stratified random sampling was used to stratify the general hospitals into urban and rural LGAs. The second stage involved the use of proportionate sampling techniques in order to draw the sample size of CBMs from each of the general hospitals sampled for the study. From each general hospital, one and a half percent (1.5%) of the CBMs was randomly sampled. This is in line with Uzoagulu (2011) who posited that when the population for a known study is known, the researcher can make use of a desired percent for the study.

Data collection was conducted using a pretested interviewer-administered structured questionnaire, designed by the researchers. However, out of the 515 copies administered on the respondents, only 431 (83.69%) (206 urban and 225 rural) were returned and utilized at the level of data analysis. Pearson's Product Moment Correlation Coefficient was used to examine the relationship between the correlates and pregnancy related complications. Mean scores and standard deviation was used to determine the preventive strategies adopted against pregnancy related complications based on location. Hypotheses were tested using multiple regression and t-test statistic all at .05 level of significance.

In answering research questions 1 and 2, the coefficient (r) and the size of the relationship was interpreted using the interpretation of correlation coefficient by Downie & Heath cited in Nworgu (2015), thus: .80 and above for high, above 0.30 and below 0.80 for moderate and 0.30 and below for low respectively. Multiple regression was used to test the null hypotheses at 0.05 level of significant. Significant associations were observed for any p value less than 0.05. The decision rule for research question 3 was based on real limit of numbers: Strongly Agree (SA) = 3.50-4.00; Agree (A) = 2.50-3.49; Disagree (D) = 1.50-2.49; Strongly Disagree (SD) = 0.00-1.49. For the hypotheses, t-test statistic was used to test the null hypotheses at 0.05 level of significant. Alpha (α) is set at 0.05 level of significance. Significant associations were observed for any p value less than 0.05.

Ethical approval for the study was obtained from the Ethics and Research Committee of the Enugu State Ministry of Health. Participation was fully voluntary, confidentiality and anonymity assured, and written informed consent obtained from the participants.

Conflict of Interest

The authors have declared that no competing interests exist.

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The authors received no specific funding for this work.

RESULTS

Table 1: Pearson's Correlation between Pregnancy Related Complications and Age of CBMs in Enugu State

			Pregnancy Related Complications	Age of CBMs	Dec.
Pregnancy Related Complications	Correlation Coefficient				
	Sig. (2-tailed)	431	1.00	.89	High Relationship
	N				
Age of CBMs	Correlation Coefficient	431	.89	1.00	
	Sig. (2-tailed)				
	N				

The table above shows the Pearson's Correlation Coefficient on the relationship between pregnancy related complications and age of CBMs in Enugu State. In the analytical process carried out, the respondents' responses indicated that the Pearson's Correlation Coefficient, $r(431) = .89$. The outcome of the findings revealed that there is a high relationship between pregnancy related complications and age of CBMs in Enugu State.

Table 2: Pearson's Correlation between pregnancy related complications and educational level of CBMs in Enugu State

			Pregnancy Related Complications	Educational level of CBMs	Dec.
Pregnancy Related Complications	Correlation Coefficient				
	Sig. (2-tailed)	431	1.00	.83	High Relationship
	N				
Educational level of CBMs	Correlation Coefficient	431	.83	1.00	
	Sig. (2-tailed)				
	N				

Table 2 above shows the Pearson's Correlation Coefficient on the relationship between pregnancy related complications and educational level of CBMs in Enugu State. In the analysis conducted, the respondents' responses showed that the Pearson's Correlation Coefficient, $r(431) = .83$. The findings of the study showed that there is a high relationship between pregnancy related complications and educational level of CBMs in Enugu State.

Table 3: Mean scores and standard deviation of the CBMs in urban and rural areas on the preventive strategies for pregnancy related complications of CBMs in Enugu State

S/ N	The following are the preventive strategies for pregnancy related complications of CBMs:	Urban n=206							Rural=225							Overall		
		SA	A	D	SA	X	SD	De c	SA	A	D	S D	X	SD	De c	Mea n	SD	D ec
1	regular antenatal care.	57	61	41	47	2.62	0.14	A	82	66	45	32	2.88	0.11	A	2.75	0.13	A
2	use of health screening such as blood sugar.	66	51	48	41	2.69	0.17	A	45	51	66	63	2.65	0.15	A	2.53	0.12	A
3	having a minimum of four antenatal visits per month.	41	48	50	67	2.31	0.12	D	51	45	63	66	2.36	0.13	D	2.36	0.28	D
4	treatment of minor ailments such as malaria.	61	53	44	48	2.57	0.05	A	58	69	48	50	2.60	0.14	A	2.59	0.25	A
5	administration of appropriate supplements.	45	42	69	50	2.40	0.21	D	44	54	71	56	2.38	0.19	D	2.35	0.13	D
6	adequate nutrition.	55	60	48	43	2.61	0.13	A	64	68	52	41	2.69	0.15	A	2.65	0.13	A
7	moderate regular exercise for moderate weight.	41	44	51	70	2.27	0.16	D	45	49	70	61	2.35	0.17	D	2.31	0.17	D
8	health education on pregnancy related complications.	60	55	43	48	2.62	0.14	A	62	70	44	49	2.64	0.11	A	2.63	0.17	A
9	health counselling on pregnancy related complications.	44	41	69	52	2.37	0.09	D	43	50	72	60	2.34	0.04	D	2.39	0.17	D
10	encouraging pregnant women's health seeking behaviours such as complaining any danger sign to the doctor to prevent pregnancy complications.	59	64	43	40	2.69	0.13	A	73	59	51	42	2.72	0.06	A	2.83	0.17	A
11	strengthening government health centres at the local level to avoid unnecessary delay of antenatal care services.	64	55	47	40	2.69	0.13	A	70	62	49	44	2.70	0.12	A	2.69	0.12	A
12	periodic diagnosis of age – related disorders that could impair pregnancy and birth outcomes.	41	44	52	69	2.28	0.12	D	44	50	61	70	2.30	0.12	D	2.45	0.12	D
13	exposure to work stressors such as excessive work load and work-related hazards should be avoided by pregnant women.	51	68	44	43	2.62	0.14	A	68	60	53	44	2.68	0.12	A	2.65	0.12	A
	Grand Mean					2.52	0.13	A					2.56	0.12	A	2.55	0.12	D

Key: A-Agree. D-Disagree.

The table above shows the mean scores and standard deviations of CBMs in urban and rural areas on the preventive strategies for pregnancy related complications of CBMs in Enugu State. The mean scores of the CMBs of the urban areas range from 2.27-2.69 while the mean scores of those in the rural areas range from 2.30-2.88. The respondents had cluster means of 2.52 and 2.55 as well as standard deviations of .13 and .12 respectively. From the outcome of the standard deviations, the researcher noticed that the responses of the respondents were closely related. This is an indication that the respondents agreed on the various preventive strategies for pregnancy related complications of CBMs in Enugu State.

Hypotheses

H₀₁: There is no significant relationship between pregnancy related complications and age of CBMs in Enugu State.

Table 4: Regression Analysis of the Correlate between pregnancy related complications and age of CBMs

Model	Sum of Squares	df	Mean Square	F	P-value	Dec
Regression	.035	1	.035	.431	.034	S
Residual	12..470	430	.029			
Total	12.820	431				

$R^2 = .21$

The hypothesis tested on table 4 shows a regression analysis of the correlate between pregnancy related complications and age of CBMs. The outcome of the F-ratio was .431 =p value .034. The p value of .034 is less than .05 level of significance set for this study, hence, the hypothesis is significant. Therefore, there is a significant relationship between pregnancy related complications and age of CBMs in Enugu State.

H₀₂ There is no significant relationship between pregnancy-related complications and educational level of CBMs in Enugu State.

Table 5: Regression Analysis of the Correlate between pregnancy related complications and educational level of CBMs

Model	Sum of Squares	df	Mean Square	F	P-value	Dec
Regression	.043	1	.043	1.015	.019	S
Residual	26.660	430	.062			
Total	26.703	431				

$R^2 = .18$

The hypothesis tested on table 5 shows a regression analysis of the correlate between pregnancy related complications and educational level of CBMs. The outcome of the F-ratio was 1.015 = p

value .019. The p value of .019 is less than .05 level of significance set for this study, hence, the hypothesis is significant. Therefore, there is a significant relationship between pregnancy related complications and educational level of CBMs in Enugu State.

H₀₃: There is no significant difference between the mean ratings of CBMs in urban areas and their counterparts in rural areas on the preventive strategies for pregnancy related complications in Enugu State.

Table 6: t-test of Difference Between the urban and rural CBMs on the preventive strategies for pregnancy related complications in Enugu State

Group	N	Mean	SD	df	t-cal	p-value	Decision
Urban	206	2.52	.13	429	.05	.011	Not Significant
Rural	225	2.55	.12				

Data in Table 6 for urban and rural CBMs on the preventive strategies for pregnancy related complications indicated that the calculated value of .05 at 429 degree of freedom has a p-value of .011 which is less than .05 level of significance set for this study. This signifies that there is no significant difference between the mean ratings of CBMs in urban areas and their counterparts in rural areas on the preventive strategies for pregnancy related complications of CBMs in Enugu State.

DISCUSSION

The findings of this study revealed a significant relationship between pregnancy-related complications and the age of childbearing mothers (CBMs) in Enugu State. This finding is consistent with Eni-Olorunda, Akinbode, and Akinbode (2015), who posited that pregnancy beyond 35 years is considered high risk due to advanced maternal age. It also aligns with Harrison (2017), who demonstrated that the age range of 20–30 years represents the safest period for childbearing. Similarly, the World Health Organization (WHO, 2017) reported that teenage girls under 15 years and women in their mid to late forties are at higher risk of pregnancy-related complications.

However, the present finding disagrees with Prakash et al. (2015), who reported no significant relationship between the incidence of anaemia and women's age. The hypothesis tested in this study further confirmed a significant relationship between pregnancy-related complications and age of CBMs in Enugu State. This finding is also in agreement with Kenny et al. (2013), who found a significant relationship between pregnancy-related complications and maternal age. The implication of this finding is that both adolescent and advanced maternal age groups are more vulnerable to pregnancy-related complications. It could be that CBMs within these age extremes may have experienced one or more complications during pregnancy, which enhanced their awareness of the relationship between age and pregnancy outcomes. The researcher therefore agrees that teenage mothers and older women are more likely to experience pregnancy-related complications due to biological and physiological vulnerability, and thus require additional care and monitoring during pregnancy.

Furthermore, the findings of the study revealed a significant relationship between educational level and pregnancy-related complications among CBMs in Enugu State. This finding is in agreement with Ayenigbara (2012), who found that women with low educational levels were more likely to engage in unhealthy behaviours such as smoking, which doubled their risk of delivering a stillbirth infant. It also supports Briggs (2013), who reported that maternal education has a strong influence on the prevention of maternal mortality and positively affects reproductive health behaviour. Similarly, Govindasamy and Ramesh (2014) found that female education is significantly associated with maternal mortality outcomes.

However, the finding disagrees with Prakash et al. (2015), who reported no significant relationship between educational level and the incidence of anaemia in pregnancy. The implication of this finding is that knowledge and education play a crucial role in the management and prevention of pregnancy-related complications. It could be that women with higher educational attainment, combined with regular antenatal care attendance, are better able to recognize danger signs and manage pregnancy-related complications effectively.

The hypothesis tested in this regard also revealed a significant relationship between educational level and pregnancy-related complications among CBMs in Enugu State. This finding is in agreement with Govindasamy and Ramesh (2014), who stated that the relationship between maternal education and pregnancy outcomes is significant. The researcher therefore posits that the level of education of childbearing mothers is an important determinant in the prevention of pregnancy-related complications. Higher educational attainment may enhance women's knowledge of pregnancy danger signs and improve their utilization of antenatal care services and adherence to preventive health practices.

In addition, the study identified preventive strategies for pregnancy-related complications among CBMs, including regular antenatal care attendance, use of health screening services such as blood sugar testing, attendance of a minimum of four antenatal visits, treatment of minor ailments such as malaria, and administration of appropriate iron supplements. This finding is in agreement with the Centers for Disease Control and Prevention (CDC, 2024), which outlined key practices that promote healthy pregnancy and reduce the risk of complications. It also supports Kalu (2018), who stated that regular antenatal visits are essential strategies for preventing pregnancy-related complications.

The implication of this finding is that awareness and adoption of preventive strategies may help CBMs identify early warning signs of pregnancy complications and seek timely medical intervention. It is possible that some CBMs may have previously applied one or more of these strategies during pregnancy and experienced positive outcomes, thereby reinforcing their importance in maternal health practices.

Furthermore, the hypothesis showed no significant difference between the mean ratings of CBMs in urban and rural areas regarding preventive strategies for pregnancy-related complications in Enugu State. This finding may be attributed to the impact of government interventions such as the "Mother and Child" programme implemented by the Enugu State Government, which may have improved access to maternal health information and services across both urban and rural settings. This suggests that such initiatives may have contributed to reducing disparities between urban and rural CBMs in their awareness and adoption of preventive strategies.

CONCLUSION

From the various findings of the study, it was concluded that the childbearing mothers' age and educational level both have significant associations with pregnancy-related complications.

RECOMMENDATIONS

Based on the findings, the following recommendations were forward:

1. Since there is a significant association between age of the CBMs and pregnancy-related complications, it then means that Health care professionals detailed to manage antenatal programmes should sensitize and educate women on the dangers of teenage and late pregnancies due to high complications for the age brackets. The programme of activities of ANC should educate pregnant women on regular ANC attendance and healthy lifestyle.
2. Educational background was found to have an association with pregnancy-related complications hence the antenatal (ANC) programme of activities should be made robust to educate both the educated and less educated women on the need for regular ANC attendance for early sensitization of pregnancy complications.
3. There is the need to provide the ANC women with leaflets and handbills on preventive strategies of pregnancy-related complications in order to sustain the already existing knowledge of it.

References

- Anyichie, N. E. & Nwagu, E. N. (2019). Prevalence and maternal socio-demographic factors associated with stillbirth in health facilities in Anambra, South-East Nigeria. *African Health Sciences*; 19(4); 3055-3062. [10.4314/ahs.v19i4.27](https://doi.org/10.4314/ahs.v19i4.27)
- Ayemigbara, G. O. (2012). Investigating the social and economic factors causing stillbirth among women in Akoko South West Local Government Area of Ondo State. *Journal of Dental and Medical Services*, 3(4); 1-9.
- Azuh, D., Azuh, A., Adekola, P. & Amoo, E. (2017). Knowledge of socio-demographic factors influencing health service usage among pregnant mothers in Nigeria. *Proceedings of ADVED 2017- 3rd International Conference on Advances in Education and Social Sciences*; 1096-1101.
- Briggs, N. (2013). Illiteracy and maternal health: Educate or die. *BMJ*, 341:1063-1064.
- Center for Disease Control and Prevention (2024). *Pregnancy complications. Maternal infant health.* <https://www.cdc.gov/maternal-infant-health/pregnancy-complications/index.html>
- Cheptum, J., Omoni, G. & Waithira, M. (2018). Factors affecting birth preparedness among pregnant women attending public antenatal clinics in Migori County, Kenya. *Biomed J Sci & Tech Res.* 3(4); 3409-3415.
- Chinawa, J. M., Odetunde, O. I., Ndu, I. K., Ezugwu, E. C., Aniwada, E. C., Chinawa, A. T. & Ezenyirioha, U. (2016). Postpartum depression among mothers as seen in hospitals in Enugu, South-East Nigeria: an undocumented issue. *Pan African Medical Journal*, 23.180.8244.
- Derricott, B. (2014). Pregnancy complications. *Wild Iris Medical Education.* <http://wildirismedicaleducation.com>
- Elo, I. T. (2012). Utilisation of maternal health-care services in peru: The role of women's education. *Health Transition Review*, 2: 49-69.
- Eni-Olorunda, T., Akinbode, O. O. & Akinbode, A. O. (2015). Knowledge and attitude of mothers on risk factors influencing pregnancy outcomes in Abeokuta South Local Government Area, Ogun State. *European Scientific Journal*; 11(11); 311-324
- Ezeh, O. K. (2018). Determinants of neonatal mortality in Nigeria: Evidence from the 2018 demographic and health survey. *BMC Public Health*, 14(1). <https://doi.org/10.1186/1471-2458-14-521>

- Govindasamy, P. & Ramesh, B.M. (2014). Maternal education and the utilization of maternal and child health services in India. *National Family Health Survey Subject Reports*. International Institute for Population Sciences, Mumbai, India, Macro International Inc, Maryland, USA.
- Harrison, K. A. (2017). Maternal mortality in Nigeria: The real issues: *African Journal of Reproductive Health*; 1(1):7-13.
- Johnson, L. (2020). Managing a high-risk pregnancy. *Obstet Gynecol.* 2003; 102:1006-1014
- Kalu, M. O. (2018). Demographic correlates of pregnancy-related complications and preventive strategies among childbearing mothers in Imo State, Nigeria. *Unpublished Thesis*, Department of Human Kinetics and Health Education, University of Nigeria Nsukka.
- Kenny, L.C., Lavender, T., McNamee, R., O'Neill, S. M., Mills, T. & Khashan, A. S. (2013). Advanced maternal age and adverse pregnancy outcome: Evidence from a large contemporary cohort. *PLoS ONE* 8(2): e56583. <https://doi.org/10.1371/journal.pone.0056583>
- Londero, A.P., Rossetti, E., Pittini, C., Cagnacci, A. & Driul, L. (2019). Maternal age and the risk of adverse pregnancy outcomes: A retrospective cohort study. *BMC Pregnancy and Childbirth*; 19:261
- Mbonu, E. O. (2018). Knowledge, attitude and practice of birth preparedness and complication readiness amongst pregnant women in Eti-Osa, LGA, Lagos. *Universal Journal of Public Health*; 6(4): 220-230, <http://www.hrpub.org>
- Muokwogwo, R. (2012). *Incidence of maternal mortality*. Allyn Publishing
- Ndu, G. U. (2012). Poverty alleviation programme in Nigeria: Challenges to implementation. *Journal of Women in Colleges of Education*, 6, 17-30.
- Nworgu, B. G. (2015). *Educational research: Basic issues and methodology (Third Edition)*. University Trust Publishers.
- Oluka, B.N. (2014). Instructional skill needs of teachers for inclusive classroom in primary schools in Ebonyi State. *An unpublished Ph.D. thesis*, University of Nigeria Nsukka.
- Omoruyi, G. (2018). Causes of maternal mortality in Nigeria, Sunday Observer, Benin.
- Ozor, L. (2017). Maternal age and fetal loss: Population based register linkage study. *BMJ* 320:1708–1712.
- Prakash, S., Yadav, K., Bhardwaj, B. & Chaudhary, S. (2015). Incidence of Anemia and its Socio-demographic determinants among pregnant women attending for antenatal care: A cross sectional study. *International Journal of Medical and Health Research*; 1(3); 12-17.
- Sede, I.P. & Rolle, R.A. (2018). Socio-economic determinants of birth preparedness and complication readiness behaviour among pregnant women in Ughelli North Local Government Area of Delta State of Nigeria. *International Journal of Development and Management Review (INJODEMAR)*, 13(1); 89-107.
- Uzoagulu, A. E. (2011). *Practical guide to writing research project reports in tertiary institutions*. Cheston.
- WHO (2025). New research sheds light on major causes of maternal deaths. <https://www.who.int/news/item/08-03-2025-many-pregnancy-related-complications-going-undetected-and-untreated--who>
- World Health Organization (2020). *Maternal mortality ratio: Health statistics and health information systems*.
- WHO. (2018). *Maternal mortality: Key facts*. <http://www.who.int/news-room/fact-sheets/detail/maternal-mortality>
- World Health Organization. (2017). *Maternal mortality in 2015: Estimates developed by WHO, UNICEF, UNFPA and the World Bank Geneva*. WHO.