PREGNANCY-RELATED ANXIETY AND ASSOCIATED FACTORS AMONG PREGNANT MOTHERS ATTENDING ANTENATAL CLINICS IN ENUGU SOUTH LGA, ENUGU STATE

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Abstract
The study investigated pregnancy-related anxiety (PRA) and associated factors among pregnant mothers attending antenatal clinics in Enugu South LGA, Enugu State. Four specific objectives with the corresponding research questions and three null hypotheses guided the study. A cross-sectional survey research design was adopted for the study. The population for the study consisted of 2,227 pregnant mothers attending antenatal clinics in Enugu South LGA. The sample size of 353 pregnant mothers was drawn using convenience sampling procedure. The instrument used for data collection was titled Pregnancy-Related Anxiety and Associated Factors Questionnaire (PRAAFQ) and consisted of the Perinatal Anxiety Screening Scale (PASS) and Oslo Social Support Scale (OSSS-3) with internal consistency of reliability indices of .792 and .763 respectively. Frequency, percentages and point-biserial correlation (r_{pb}) were used to answer the research questions. The null hypotheses were tested using Chi-Square statistics at .05 level of significance. Results showed that 42.8% of pregnant mothers experienced PRA. Parity (p= .002 < 0.05) was significantly associated with PRA. However, demographic factors (age, education level and employment status), obstetric factors (gestational age and history of miscarriage) and social support were not significantly associated with PRA. The researchers, therefore, recommended among others that pregnant mothers should be empowered through education, awareness creation and counselling to better prevent PRA.

Keywords: Pregnancy-related anxiety, Demographic factors, Obstetric factors, Social support, Pregnant mothers

Introduction

Pregnancy-related anxiety (PRA) is a global health concern due to the effects on the pregnant mothers and the unborn child. Globally, 11.4 per cent to 63 per cent of women experience anxiety during pregnancy (Priya et al., 2018). Pregnancy-related anxiety (PRA) is also prevalent in the low and middle-income countries (LMICs) as well as the developing countries. In Africa, PRA has been a matter of great concern. In Nepal, 17.8 per cent of women aged 18 - 65 years had anxiety (Risal et al., 2016). Also, Tafara et al. (2022) reported that 32.7 per cent of pregnant mothers in South West Ethiopia had PRA. The prevalence of PRA was also found to be 43.9 per cent in North West Ethiopia (Abegaz et al., 2022).

Pregnancy-related anxiety is also prevalent among pregnant mothers in Nigeria. Busari (2018) reported a prevalence of 26 per cent of anxiety during pregnancy in Ibadan, Oyo State. Gadanya et al. (2018) reported that the prevalence of antenatal anxiety was 23.2 per cent among pregnant women attending antenatal clinic in Aminu Kano Teaching hospital, Kano. In Abakaliki, Eastern Nigeria, a prevalence of 11 per cent of anxiety among pregnant women during the COVID-19 lockdown was reported by Nwafor et al. (2021). Also, Akinsulore et al. (2021) reported a prevalence of 43.5 per cent of PRA in Obafemi Awolowo University Teaching hospital complex, Ile-Ife. However, there is a paucity of studies on PRA among

pregnant mothers who visit antenatal clinic in Enugu State generally and specifically in Enugu South Local Government Area in Enugu State. Hence the need for this study.

Anxiety is a common mental health illness that affects individuals. Crocq (2015) defined anxiety as the body's adaptive reaction to risk, difficulty, or a sense of being underprepared; it is regarded as a healthy feeling or emotion since it encourages a person to avoid risky environments or situations. Also, the American Psychological Association (APA, 2019) defined anxiety as a mood that is accompanied by tense feelings, anxious thoughts, and physical changes like elevated blood pressure. Contextually, anxiety is an individual's full response to threat or danger. When anxiety occurs during pregnancy, it is termed pregnancy-related anxiety.

Pregnancy-related anxiety (PRA) is a common problem among women during and after pregnancy. Bayrampour et al. (2016) defined PRA as fear, worry, or apprehension about a woman's pregnancy, childbirth, the health of the infant or foetus, and other pregnancy-specific social and financial issues. Rosario et al. (2017) defined pregnancy-related anxiety (PRA) as fear, worry, and a sense of unease related to the mother's, the baby's, the pregnancy's, and the delivery's health. According to Dryer and Brunton (2021), pregnancy-related anxiety is a distinct type of anxiety that affects pregnant mothers and is characterized by pregnancy-specific fears and worries. The authors also associated PRA with several bad obstetric, neonatal, and maternal outcomes. In this study, PRA refers to the feelings of concern, worry, fear related to pregnancy and the health of the unborn child and the pregnant mothers. Pregnant mothers may display PRA signs and symptoms during their pregnancies. Complications of PRA include: preterm birth and low birth weight, preeclampsia, miscarriage, and shorter gestation (Field, 2017; Ramos et al., 2018; Tomfohr-Madsen et al., 2019). Signs and symptoms accompanied by PRA include tension in the muscles, teeth grinding, and sleep issues, a panic attack which may be indicated by a sudden, overwhelming fear followed by bodily symptoms as shaking, sweating, nausea, a racing heart, or rapid breathing (Colleen, 2021). Numerous factors have been found to significantly influence the occurrence of PRA in pregnant mothers. In this study, the factors are referred to as associated factors.

Certain factors may be associated with PRA among pregnant mothers. Rothman and Greenland (2018) defined associated factors as variables that are not direct causes but that are linked to a given outcome. Such associated factors may include environmental factors, institutional factors, social factors, demographic factors and obstetric factors. However, the associated factors of interest in this study are: demographic factors, obstetric factors and social support.

Demographic factors are variables which define an individual. Many demographic factors have been found to be associated with PRA. These factors include age, education level and employment status (Nath et al., 2019; Ghezi et al., 2021; Akinsulore et al., 2021; Silva et al., 2017; Verbeek et al., 2019). Obstetric factors are variables that manifest during pregnancy. Obstetric factors that may be associated with PRA include: gestational age, parity and history of miscarriage (Silvia et al., 2017; Madhavanprabhakaran et al., 2015; Lebel et al., 2020). Social support is a factor which may be associated with PRA. According to Wiegel et al. (2015), social support is the perception and actuality that one is cared for, has assistance available from other people, and most popularly, that one is part of a supportive social network. Notwithstanding, these factors are found to be peculiar among pregnant mothers.

A woman carrying a foetus is referred to as a pregnant mother. Utoro (2013) defined a pregnant mother as a woman who has a developing embryo or foetus inside of her body. The American College of Obstetricians and Gynaecologists (ACOG, 2020) defined pregnancy as the time a foetus develops inside a woman's womb or uterus. In this study, a pregnant mother is any woman of reproductive age who is currently carrying a foetus in the development stage in Enugu South LGA. A pregnant woman goes to the antenatal clinic for antenatal treatment

during her pregnancy. The WHO (2016) defined antenatal clinic as health centre provided by qualified health-care professionals to expectant mothers and adolescent girls in order to ensure the best health conditions for both mother and child during pregnancy.

This study was conducted in Enugu South Local Government Area (LGA) Enugu State. Its headquarters are in the town of Uwani, Nnobi Street Enugu, and covers the communities of Akwuke, Amechi, Ugwuaji, Obeagu, Awkunanaw and Amechi-Uwani. According to Uzor, Idoko and Nwobodo (2021), the government of Enugu State introduced a free maternal and child health (FMCH) care programme in January 2008. Included in the health package of the FMCH programme are maternal health services consisting of antenatal care of 12 - 40 weeks, routine laboratory investigations and drugs, all deliveries, such as safe delivery, basic emergency obstetric care (EOC), comprehensive EOC, postnatal care up to six weeks (Uzor et al., 2021). These programmes are often neglected the mental health of pregnant mothers. Therefore, there is a growing need to address the issue of PRA as it has become a problem among pregnant mothers reason being that PRA has been identified to be the cause of high maternal and foetus mortality. This study therefore was aimed to tackle the problems of anxiety in pregnancy by investigating PRA and associated factors among pregnant mothers attending antenatal clinic in Enugu South Local Government Area in Enugu State.

Statement of the Problem

Pregnancy is one of the most remarkable time in a woman's life and that of her family. It is associated with the feeling of joy and fulfilment. As a result of the physiological (functional) and hormonal changes affecting the mental health status of pregnant mothers, problems including PRA may occur. However, with a holistic healthcare approach, pregnant mothers need not worry or have fears over the pregnancy outcome but trust the health system.

Regrettably, despite efforts made by the government and healthcare providers to improve the health of the pregnant mothers and their unborn children, it is worrisome that PRA is still on the increase. If efforts are not intensified to mitigate mental health problems such as PRA among pregnant mothers, the outcome may become unbearable.

Although PRA and its associated factors have been the subject of published studies in both developed and developing countries, Nigeria inclusive, no study has been conducted on pregnancy related anxiety and associated factors among pregnant mothers attending antenatal clinic in Enugu South LGA, Enugu State. In view of these facts, the study seeks to investigate PRA and its associated factors among pregnant mothers in Enugu South LGA.

Purpose of the Study

The purpose of the study was to investigate pregnancy-related anxiety and associated factors among pregnant mothers attending antenatal clinic in Enugu South LGA, Enugu State. Specifically, the study determined the:

- proportion of pregnant mothers who experienced PRA;.
- relationship between PRA and pregnant mothers' demographic factors (age, education level and employment status).
- relationship between PRA and obstetric factors (gestational age, parity and history of miscarriage).
- relationship between PRA and social support.

Research Questions

The following research questions guided the study:
1. What is the proportion of pregnant mothers who experienced PRA?
2. What is the relationship between PRA and demographic factors (age, education level and employment status)?

3. What is the relationship between PRA and obstetric factors (gestational age, parity and history of miscarriage)?
4. What is the relationship between PRA and social support?

Hypotheses

The following null hypotheses were postulated to guide this study and were tested at .05 level of significance:

1. Demographic factors (age, education level and employment status) are not significantly associated with PRA.
2. Obstetric factors (gestational age, parity and history of miscarriage) are not significantly associated with PRA.
3. Social support is not significantly associated with PRA.

Methods

In order to accomplish the purpose of this study, a cross-sectional survey research design was employed. The study was conducted in Enugu South LGA, Enugu State. The population of the study consisted of 2,227 pregnant mothers attending antenatal clinic in Enugu South LGA. The sample size was 353 pregnant mothers based on the guideline of Cohen et al. (2018), that when a population size is 2,000 and above at 95% confidence level (5% interval), the sample size should be 322 and above. The sample was drawn using convenience sampling procedure which depended upon voluntary willingness of pregnant mothers to participate in the study. The instrument for data collection was titled Pregnancy-Related Anxiety and Associated Factors Questionnaire (PRAAFQ) which was divided into sections A, B and C respectively. The section A consisted of items on participant's characteristics, the section B was the Perinatal Anxiety Screening Scale (PASS) and the section C was Oslo Social Support Scale (OSSS-3). The instrument was validated by three experts in the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka to ensure face validity. The internal consistency of PASS and OSSS-3 was determined using Cronbach's Alpha with indices of .792 and .763 respectively and were adjudged reliable for the study. The Statistical Package for Social Sciences (SPSS version 26) was used for data analysis. Research questions were answered using frequency, percentages, and point biserial correlation. The null hypotheses were tested using Chi-Square at .05 level of significance. Interpretation of the correlation coefficient (r_{pb}) between the independent and dependent variables was based on Nwagu and Agbaje (2017) estimates for weak, moderate and strong correlation coefficients. The correlation coefficient of +-.00 - .29 was interpreted as none (.00) or weak relationship (NR or WR), +-.30 - .59 was interpreted as moderate relationship (MR), and +-.60 - 1.00 was interpreted as strong relationship (SR).

Results

The results of the study are presented according to the research questions and hypotheses that guided the study.

Research question one: What is the proportion of pregnant mothers who experienced PRA?

Table 1: Proportion of Pregnant Mothers Who Experienced PRA (n=348)

s/n	PRA status of pregnant mothers	f	%
	Pregnancy-related anxiety	149	42.8
	No pregnancy-related anxiety	199	57.2

Note: PASS Score< 26= No pregnancy-related anxiety; PASS Score≥26= Pregnancy-related anxiety

Results in Table 1 show that overall, 42.8 per cent of pregnant mothers attending antenatal clinics in Enugu South LGA, Enugu State experienced pregnancy-related anxiety.

Research question two: What is the relationship between PRA and demographic factors (age, education level and employment status)?

Table 2: Point-Biserial Correlation between Pregnancy-Related and Pregnant Mothers' Demographic Factors (n= 348)

s/n	Variables	1	2	3	4
1.	Pregnancy-related anxiety	-			
2.	Age	.112	-		
3.	Education level	.042	-.005	-	
4.	Employment status	-.059	.002	-.383	-

Significant at **$P<.01$; *$P<.05$

Results in Table 2 show that overall, there is weak positive relationship between PRA and pregnant mothers' age (r_{pb}= .112) and education level (r_{pb}= .042). Also, there is a weak negative relationship between PRA and pregnant mothers' employment status (r_{pb}= -.059).

Research question three: What is the relationship between PRA and obstetric factors (gestational age, parity and history of miscarriage)?

Table 3: Point-Biserial Correlation between PRA and Pregnant Mothers' Obstetric Factors (n= 348)

s/n	Variables	1	2	3	4
1.	Pregnancy-related anxiety	-			
2.	Gestational age	.032	-		
3.	Parity	.187	.260	-	
4.	History of miscarriage	-.079	-.046	-.269	-

Significant at **$P<.01$; *$P<.05$

Results in Table 3 show that overall, there is weak positive relationship between PRA and gestational age (r_{pb}= .032) and parity (r_{pb}= .187). Also, there is a weak negative relationship between PRA and history of miscarriage (r_{pb}= -.079).

Research question four: What is the relationship between PRA and social support?

Table 4: Point-Biserial Correlation between PRA and Social support (n= 348)

s/n	Variables	1	2
1.	Pregnancy-related anxiety	-	
2.	Social support	-.014	-

Significant at **$P<.01$; *$P<.05$

Results in Table 4 show that overall, there is weak negative relationship between PRA and social support (r_{pb}= -.014).

Hypothesis one: Demographic factors (age, education level and employment status) are not significantly associated with PRA.

Table 5: Chi-Square Test of Association between Demographic Factors and PRA (n=348)

Variables	N	PRA O(E)	No PRA O(E)	X^2	DF	p-value
Age						
15-24 years	75	39(32.1)	36(42.9)			
25-34years	199	84(85.2)	115(113.8)	4.397	2	.111
35years and above	74	26(31.7)	48(42.3)			
Education Level						
Primary education	20	7(8.6)	13(11.4)			
Secondary education	186	87(79.6)	99(106.4)	2.656	2	.265
Tertiary education	142	55(60.8)	87(81.2)			
Employment Status						
Employed	86	31(36.8)	55(49.2)			
Unemployed	49	24(21.0)	25(28.0)	2.520	2	.284
Self employed	213	94(91.2)	119(121.8)			

*Significant at P ≤ 0.05

Table 5 show no significant association between PRA and pregnant mothers' age (x^2= 4.397, df= 2, p= .111 > .05), education level (x^2= 2.656, df= 2, p= .265 > .05), and employment status (x^2= 2.520, df= 2, p= .284 > .05).

Hypothesis two: Obstetric factors (gestational age, parity and history of miscarriage) are not significantly associated with PRA.

Table 6: Chi-Square Test of Association between Obstetric Factors and PRA (n=348)

Variables	N	PRA O(E)	No PRA O(E)	X^2	DF	p-value
Gestational age						
1-3 months	80	34(34.3)	46(45.7)			
4-6 months	141	65(60.4)	76(80.6)	1.240	2	.538
7-9 months	127	50(54.4)	77(72.6)			
Parity						
None yet	82	45(35.1)	37(46.9)			
Once	93	43(39.8)	50(53.2)	15.316	3	.002
2-4 times	162	61(69.4)	101(92.6))			
5 times and above	11	0(4.7)	11(6.3)			
History of miscarriage						
Yes	56	19(24.0)	37(32.0)	2.153	1	.142
No	292	130(125.0)	162(167.0)			

*Significant at P ≤ 0.05

Table 6 shows a significant association between PRA and parity (x^2= 15.316, df= 3, p= .002 < 0.05). Also, the Table shows no significant association between PRA and gestational age (x^2= 1.240, df= 2, p-value= .538 > 0.05), and history of miscarriage (x^2= 2.153, df= 1, p-value= .142 > 0.05).

Hypothesis three: Social support is not significantly associated with PRA.

Table 7: Chi- Square Test of Association between Social Support and PRA (n= 348)

Variable	N	PRA O(E)	No PRA O(E)	X²	DF	p-value
Social support						
Poor	42	15(18.0)	27(24.0)			
Moderate	179	81(76.6)	98(102.4)	1.360	2	.507
Strong	127	53(54.4)	74(72.6)			

*Significant at P ≤ 0.05

Table 7 shows no significant association between social support and PRA (x²= 1.360, df= 2, p= .507 > 0.05).

Discussion of Findings

The findings in Table 1 showed that overall, 42.8 per cent of pregnant mothers experienced PRA. The finding was not expected as pregnancy is considered a gift and is usually associated with feelings of joy and happiness rather than worry, sadness and fear. The finding agrees with the finding of Abegaz et al. (2022) that the prevalence of PRA was 43.9 per cent. The finding is also in line with the finding of Tarafa et al. (2022) that the prevalence of PRA was 32.7 per cent. The high level of PRA reported could be because of the fact that these pregnant mothers cannot predict the future and the state of their pregnancy or that they have passed through previous pregnancy complications hence carrying this negativity, fear and worries to the present pregnancy could have caused the increase of PRA. The public through this finding may become aware of the existence of PRA among pregnant mothers and the need for extra care, love and support to all pregnant mothers. Health care providers need to awaken to the emotional and mental health needs of pregnant mothers while also dealing with their physical health. Health care providers need to create an avenue where these mothers can be privately examined to assess their mental health status.

The findings in Table 2 showed a weak positive relationship between PRA and pregnant mothers' age. The corresponding hypothesis in Table 5 show that age is not significantly associated with PRA. The findings agree with the finding of Naja et al. (2020) that age failed to show any association with PRA among pregnant mothers attending primary health care in Qatar. Also, the findings agree with the finding of Ghezi et al. (2021) that there was no significant correlation of pregnancy anxiety and maternal age. However, the findings contradict Tarafa et al. (2022) that young age is significantly associated with PRA among pregnant mothers attending ANC follow-up at Bedelle General and Metu Karl comprehensive specialized hospitals, Southwest Ethiopia.

Furthermore, Table 2 show that there is weak positive relationship between PRA and pregnant mothers' education level. Also, the corresponding hypothesis in Table 5 show that education level is not significantly associated with PRA. The findings agree with the finding of Gadanya et al. (2018) that education level was not found to be associated with anxiety during pregnancy among pregnant mothers attending antenatal clinics in Aminu Kano Teaching Hospital, Kano Nigeria. The findings also agree with the finding of Naja et al. (2020) that education level failed to show any association with PRA among pregnant mothers attending primary health care in Qatar. Conversely, the findings disagree with the finding of Kang et al. (2016) that antenatal anxiety showed significant relationship with education level lower than middle school in late pregnancy in China. Also, the findings disagree with the finding of Abegaz et al. (2022) that maternal education status was significantly associated with PRA among pregnant women attending antenatal checkup at Debre Markos town public health institutions, Northwest Ethiopia.

Additionally, Table 2 show that there is weak negative relationship between PRA and pregnant mothers' employment status attending antenatal clinics in Enugu South LGA. The

corresponding hypothesis in Table 5 show that employment status is not a significant association of PRA among pregnant mothers. The findings contradict the finding of Morris et al. (2022) that show that employment status is a significant predictor of anxiety symptoms in early pregnancy during COVID-19.

The findings in Table 3 show that there is weak positive relationship between PRA and parity. The corresponding hypothesis in Table 6 show that parity is significantly associated with PRA. Brunton, et al. (2020) confirmed that nulliparous women have greater PRA compared to multiparous women. The findings contradict the finding of Naja et al. (2020) that parity failed to show any association with PRA among pregnant mothers attending primary health care in Qatar. The findings also disagree with the finding of Ghezi et al. (2021) that there was no significant correlation of PRA and parity.

Moreover, Table 3 showed a weak positive relationship between PRA and gestational age. Likewise, the test of the corresponding hypothesis in Table 6 showed that gestational age is not significantly associated with PRA. The findings disagree with the finding of Silva et al. (2017) that showed that being in the third trimester was statistically associated with the occurrence of anxiety during pregnancy in Brazil. Also, the findings contradicted the finding of Gadanya et al. (2018) which showed no significant association between anxiety and gestational age during pregnancy.

In addition, Table 3 showed a weak negative relationship between PRA and history of miscarriage. Also, the corresponding hypothesis in Table 6 showed that history of miscarriage is not significantly associated with PRA. The findings are in contrast with the finding of Akinsulore et al. (2021) which showed significant association exists between PRA and past history of miscarriage. The findings also, contradict the finding of Morris et al. (2022) that history of miscarriage is a significant predictor of anxiety symptoms in early pregnancy during COVID-19.

The findings in Table 4 showed a weak negative relationship between PRA and social support. The corresponding hypothesis in Table 7 showed that social support is not significantly associated with PRA. The findings are in contrast with the finding of Hamzehgardeshi et al. (2021) that social support are significant predictors of PRA among Iranian pregnant women. Also, the findings disagree with the finding of Abegaz et al. (2022) that poor social support was significantly associated with PRA.

Conclusion

Based on the findings of this study, it can be concluded that the PRA is high among pregnant mothers attending antenatal clinic in Enugu South Local Government Area, Enugu State. The study also showed that pregnancy related anxiety is associated with parity. Hence, extra needs to be taken when handling pregnant mothers and, ensuring that their mental health throughout the period of pregnancy is optimal.

Recommendations

In the light of the findings, the study recommended the following:
1. Pregnant mothers regardless of their parity should be empowered through education, awareness creation and counselling to better prevent PRA.
2. Medical doctors, nurses and all health workers in charge of providing antenatal care should ensure that pregnant mothers irrespective of their parity should be routinely screened of PRA during routine antenatal care.
3. Policies and interventions aimed at promoting the mental health of pregnant mothers should be put in place to tackle the issue of PRA and steps should be taken for its prevention.

References

Abegaz, M. Y., Muche, H. A., & Aynalem, G. L. (2022). Determinants of pregnancy-related anxiety among women attending antenatal check-up at public health institutions in Debre Markos Town, Ethiopia. *Depression Research and Treatment, 2022,* 6935609. doi: 10.1155/2022/6935609

Akinsulore, A., Temidayo, A. M., Oloniniyi, I. O., Olalekan, B. O., & Yetunde, O. B. (2021). Pregnancy-related anxiety symptoms and associated factors amongst pregnant women attending a tertiary hospital in south-west Nigeria. *South Africa Journal of Psychiatry, 27*(0), a1616. https://doi.org/10.4102/sajpsychiatry.v27i0.1616.doi:10.4102/sajpsychiatry .v27i0.1616

American College of Obstetricians and Gynaecologist (ACOG). (2020). Patient education: How your foetus grows during pregnancy. *International Journal of Nursing and Midwifery, 1*(2), 40-45.

American Psychological Association (APA). (2019). *Anxiety.* http://www.apa.org/topics/anxiety /index.aspx

Bayrampour, H., Ali, E., McNeil, D. A., Benzies, K., MacQueen, G., & Tough, S. (2016). Pregnancy-related anxiety: A concept analysis. *International Journal of Nursing Studies, 55*, 115-30. doi: 10.1016/j.ijnurstu.2015.10.023

Brunton, R. J., Dryer, R., Saliba, A., & Kohlhoff, J. (2015). Pregnancy anxiety: A systematic review of current scales. *Journal of Affective Disorders, 176,* 24-34. https://doi.org/10.1016/j.jad.2015.01.039

Busari, A. O. (2018). Prevalence and associated factors of anxiety and depression among pregnant women attending antenatal care at state hospital Moniya, Ibadan, Oyo state, Nigeria. *Gender and Behaviour, 16*(3), 11938-11953.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education (8th ed).* United Kingdom: Routledge.

Colleen B. (2021). How to manage pregnancy anxiety. Retrieved from https://www.babycenter.com

Crocq, M. A. (2015). A history of anxiety: From Hippocrates to DSM. *Dialogues Clinical Neuroscience, 17*(3), 319-325. doi: 10.31887/DCNS.2015.17.3/macrocq

Dryer, R., & Brunton, R. (2021). *Pregnancy-Related Anxiety: Theory, Research, and Practice. 1st ed.* Abingdon: Routledge.

Field, T. (2017). Prenatal anxiety effects: A review. *Infant Behavioural Development, 49,* 120-128. https://doi.org/0.1016/j.infbeh.2017.08.008

Gadanya, M. A., Abulfathi, A. A., & Ahmad, F. A. (2018). Anxiety and depression in pregnancy: Prevalence and associated risk factors among pregnant women attending antenatal clinic in Aminu Kano Teaching Hospital Kano, Nigeria. *Annals of African Medical Research, 1, 1*3. doi:10.4081/same.2018.13

Ghezi, S., Eftekhariyazdi, M., & Mortazavi, F. (2021). Pregnancy Anxiety and Associated Factors in Pregnant Women. *Zahedan Journal Research of Medical Science, 23*(1), e99953. doi: 10.5812/zjrms.99953

Hamzehgardeshi, Z., Omidvar, S., Amoli, A. A., & Firouzbakht, M. (2021).Pregnancy-related anxiety and its associated factors during COVID-19 pandemic in Iranian pregnant women: a web-based cross-sectional study. *BMC Pregnancy and Childbirth, 21,* 208. doi: 10.1186/s12884-021-03694-9

Kang, Y. T., Yao, Y., Dou, J., Guo, X., Li, S. Y., Zhao, C. N., Han, H. Z., & Li, B. (2016). Prevalence and risk factors of maternal anxiety in late pregnancy in China. *International Journal of Environmental Research Public Health, 13*(5), 468-478. doi: 10.3390/ijerph13050468

Lebel, C., MacKinnon, A., Bagshawe, M., Tomfohr-Madsen, L., & Giesbrecht, G. (2020). Elevated depression and anxiety among pregnant individuals during the COVID-19 pandemic. *Journal of Affect Disorder, 277,* 5-13. doi: 10.1016/j.jad.2020.07.126

Madhavanprabhakaran, G. K., D'Souza, M. S., & Nairy, K. S. (2015). Prevalence of pregnancy anxiety and associated factors. *International Journal of African Nursing Sciences, 3*, 1-7. http://dx.doi.org/10.1016/j.ijans.2015.06.002

Morris, J. R., Jaswa, E., Kaing, E., et al. (2022). Early pregnancy-related anxiety during covid-19 pandemic: preliminary findings from the UCSF ASPIRE study. *BMC Pregnancy and Childbirth, 22,* 272. *doi: 10.1186/s12884-022-04595-1.*

Naja, S., Al Kubaisi, N., Singh, R., & Bougmiza, I. (2020). Generalized and pregnancy-related anxiety prevalence and predictors among pregnant women attending primary health care in Qatar, 2018-2019. *Heliyon, 6*(10), e05264. https://doi.org/10.1016/j.heliyon.2020.e05 264

Nath, A., Venkatesh, S., Balan, S., Metgud, C. S., Krishna, M., & Murthy, G. V. S. (2019). The prevalence and determinants of pregnancy-related anxiety amongst pregnant women at less than 24 weeks of pregnancy in Bangalore, Southern India. *International Journal of Womens Health, 11*, 241-248. doi: 10.2147/IJWH.S193306

Nwafor, J. I., Okedo-Alex, I. N., & Ikeotuonye, A. C. (2021). Prevalence and predictors of depression, anxiety, and stress symptoms among pregnant women during COVID-19-related lockdown in Abakaliki, Nigeria. *Malawi Medical Journal, 33,* 54-58. doi: 10.4314/mmj.v33i1.8

Nwagu, E. N. & Agbaje, O. S. (2017). *Demographic and statistical methods in health, education and the social science*. Nsukka: Zion Press.

Priya, A., Chaturvedi, S., Bhasin, S. K., M. S. Bhatia, M. S., & Radhakrishnan, G. (2018). Depression, anxiety and stress among pregnant women: a community-based study. *Indian Journal of Psychiatry, 60*(1), 151-152. doi: 10.4103/psychiatry.IndianJPsychiatry_ 230_17

Ramos, I. F., Guardino, C. M., Mansolf, M., Glynn, L. M., Sandman, C. A., Hobel, C. J., Schetter, C. D. (2019). Pregnancy anxiety predicts shorter gestation in Latina and non-Latina white women: The role of placental corticotrophin-releasing hormone. *Psychoneuroendocrinology, 99,* 166-173. doi: 10.1016/j.psyneuen.2018.09.008

Risal, A., Manandhar, K., Linde, M., Steiner, T. J., & Holen, A. (2016). Anxiety and depression in Nepal: prevalence, comorbidity and associations. *BMC Psychiatry, 16*, 102. doi: 10.1186/s12888-016-0810-0.

Rosario, M. K., Premji, S. S.,Nyanza, E. C., Bouchal, S. R., & Este, D. (2017). A qualitative study of pregnancy-related anxiety among women in Tanzania. *BMJ Open, 7*(8)*, e016072. doi: 10.1136/bmjopen-2017-016072.

Rothman, K. J., & Greenland, S. (2018). Modern epidemiology. Lippincott Williams &. Wilkins.

Silva, M. M. J., Nogueira, D. A., Clapis, M. J., & Leite, E. P. R. C. (2017). Anxiety in pregnancy: prevalence and associated factors. *Revista da Escola de Enfermagem da U S P, 51*, e03253. https://doi.org/10.1590/S1980-220X2016048003253

Tarafa, H., Alemayehu, Y., & Nigussie, M. (2022). Factors associated with pregnancy-related anxiety among pregnant women attending antenatal care follow-up at Bedelle general hospital and Metu Karl comprehensive specialized hospital, Southwest Ethiopia. *Front. Psychiatry 13,* 938277. doi: 10.3389/fpsyt.2022.938277

Tomfohr-Madsen, L., Cameron, E. E., Dunkel Schetter, C., Campbell, T., O'Beirne, M., Letourneau, N., & Giesbrecht, G. F. (2019). Pregnancy anxiety and preterm birth: The moderating role of sleep. *Health psychology: Official Journal of the Division of Health*

Psychology, American Psychological Association, 38(11), 1025–1035. https://doi.org/10.1037/hea0000792

Utoro, B. T. (2013). Hepatitis B surface antigenemia (HBsAg) among pregnant women in Southern Nigeria. *African Health Science, 13*(4), 1139-43.doi: 10.4314/ahs.v13i4.39

Uzor, F., Idoko, A., & Nwobodo, E. (2021). Implementation of a free maternal and child health programme in Nigeria State. *International Journal of Medicine and Health Development, 26*(1), 44-49. doi: 10.4103/ijmh.IJMH_44_20

Verbeek, T., Bockting, C. L. H., Beijers, C., Meijer, J. L., Van Pampus, M. G., & Burger, H. (2019). Low socioeconomic status increases effects of negative life events on antenatal anxiety and depression. *Women and Birth, 32*(1), E138-E143. https://doi.org/10.1016/j.wombi.2018.05.0

Wiegel, C., Sattler, S., & Goritz, A. S. (2015). Work-related stress and cognitive enhancement among university teachers. *Anxiety, Stress, and Coping, 29*(1), 1-18.

World Health Organization (WHO). (2016). WHO recommendations on antenatal care for a positive pregnancy experience. ISBN: 978 92 41549912. https://who.int/reproductivehealth/publications/maternal-perinatal-health/annc-positive-pregnancy-experience/en/