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Prevalence of Prenatal Stress Among Pregnant Women Attending Selected Antenatal Clinics in Nairobi County, Kenya.

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Abstract

Globally, preterm birth is the most common pregnancy complication, and though preventable, prenatal stress remains its leading cause. Despite this, prenatal stress goes undetected because it is not one of the assessments in the antenatal care visits leading to under diagnosis of this condition. In Kenya, the prevalence of prenatal stress remains unclear due to limited research. The purpose of this study was to determine the prevalence of prenatal stress among pregnant women in Antenatal Care (ANC) Clinics in Nairobi County. In this study, cross-sectional research design, stratified and systematic sampling techniques were used. 264 respondents from two selected level three hospitals were recruited. The study used Perceived Stress Scale 10 (PSS 10) tool to collect data while the analysis descriptive data analysis. The prevalence of prenatal stress was 48.9%, cohabiting women had a prevalence of 100%, single 62.9%, women above 35 years had 77.8% prevalence, those with primary level of education had 61.2% and self-employed at 57.1%. This study highly recommends continuous assessment of prenatal stress during routine ANC clinic to mitigate its effects on pregnant women.

Keywords: Preterm, prenatal stress, antenatal care, perceived stress, pregnancy.

Introduction and Background

Prenatal stress occurs when a pregnant woman experiences difficulties in managing worries and demands during pregnancy (Engidaw et al., 2019). Globally, preterm birth is the most common problem in pregnancy, and prenatal stress, though preventable, is the most common cause of this problem. Symptoms of prenatal stress may include an increased pulse rate, palpitations, high blood pressure, loss of appetite, difficulty concentrating, social withdrawal, insomnia, and heightened vigilance.

Prenatal stress is one of the contributing factors to poor birth outcomes, including preterm birth, low birth weight, increased susceptibility to illness and increased neonatal death rate (Gangadharan & Jena, 2019).Walsh et al., (2019), in their study done in America, found that preterm birth increased in pregnant women who had experienced stressful situations such as intimate partner violence (IPV), lack of social support, and unplanned pregnancies. In a retrogressive study done in Linköping University Hospital in Sweden, found that prenatal stress was twice more common in women who gave birth to preterm babies than those who gave birth to term babies. The study concluded that 20% of women who gave birth to preterm babies were exposed to maternal stress during pregnancy (Lilliecreutz et al., 2016). In a systematic review done by Pias and Pia (2018), all the 14 studies reviewed revealed that an increase in prenatal stress was associated with prematurity and preterm delivery. Collectively, all these studies demonstrate that prenatal stress is a significant contributor to preterm births.

General adaptation syndrome (GAS) theory by Hans Selye (1979) also concurs that prenatal stress is a significant contributor of preterm labour. This theory suggests that when a pregnant woman experiences chronic stress, her body produces more stress hormones. Since the placenta also makes these hormones, their levels become too high. This triggers chemicals called prostaglandins, which soften the cervix too soon and can lead to preterm birth (Reshef & Hugh, 2021). The theory also states that, various systems in the body are affected during stress and some of these systems are circulatory, digestive, and immune systems. This causes the woman to present with hypertension, pre-eclamsia, lack of appetite and prone to infections which can also lead preterm births (Zietlow et al., 2019).

Preterm birth is the most common complication in pregnancy worldwide, and prenatal stress, though preventable, is the prevailing cause of this problem (Tanpradit & Kaewkiattikun, 2020). Preterm is defined as babies born alive before 37 weeks gestation (World Health Organization [WHO], 2018). As noted by Keller et al. (2010), preterm birth is the major predisposing factor for neonatal mortality and morbidity; preterm deaths account for 63% of all deaths in children under five years in the world. Globally, preterm birth prevalence ranges between 5% and 18% across 187 countries, and every year, approximately 15 million babies are born prematurely, which is more than one in 10 babies (WHO, 2018). According to Liu et al. (2016), an estimated one million

children die annually due to complications of preterm births, and those who survive suffer permanent disabilities, including learning, visual, respiratory, and auditory problems.

Sub-Saharan Africa and Asia have the highest rate of preterm births, which accounts for half of the world's births. More than 60% of the world's preterm babies and over 80% of the world's 1.1 million neonatal deaths annually are due to complications related to preterm births (WHO, 2012). As attested by Wagura et al. (2018), preterm babies born in Africa are 12 times more likely to die of complications than those born in Europe. In Kenya, 193,000 babies are born preterm per year, and 13,300 children under five die due to preterm complications (Every Preemie Scale 2019). Preterm births necessitate prolonged hospitalization and advanced care. Some babies also require long-term specialized care, which heightens the financial burden on the country, health institutions, and the family (Okube & Sambu, 2017).

The prevalence of prenatal stress among pregnant women is evident in many studies. Boekhorst et al. (2021) observed that the prevalence of prenatal stress varies from 5.5% to 78% globally. A study done by Deo et al. (2020) revealed that the prevalence of prenatal stress among Iranian women was 91.89%. Another study done among Malaysian pregnant women showed a prevalence of 75% (Keramat et al., 2021). In Africa, the prevalence of prenatal stress among Ghanaian women was 28.6% (Boakye-Yiadom et al., 2015). This was comparable to a study done in Ethiopia, which showed a prenatal stress prevalence of 23.1% (Deksisa et al., 2020). On the other hand, a study done by Engidaw et al. (2019) in Bale Zone Hospital in Southeast Ethiopia among pregnant women established a prevalence of 11.6%. Andhavarapu et al. (2021) conducted research in the Migori rural part of Kenya and found that the prevalence of prenatal stress was 75.4% in pregnant women who experienced IPV.

Provision of essential intervention during the antenatal period can enhance a pregnant woman's and infant's well-being. Although several institutions and organizations are involved in the development of antenatal packages, unfortunately, such packages exclude maternal stress assessment (Shosha, 2016). As attested by the WHO (2016), antenatal guidelines should include a physiological assessment of the mother (physical exam, lab tests, blood pressure, and provision of iron and folic supplements, among others), foetal assessment (fundal height, foetal heart, and

obstetric ultrasound), and health education on danger signs and nutrition. Nevertheless, the guideline, which is used in all Kenyan health institutions, lacks prenatal stress assessment, thus underdiagnosis of the condition during routine ANC clinic.

Methodology

This study used quantitative cross sectional research design. Data collection was done using researcher formulated social demographic questionnaire and perceived stress scale 10 PSS 10. Pretesting of social demographic questionnaire was done in Kahawa west health centre. PSS 10 is a standardized tool which is used to measure individual level of stress, has a Comparative Fit Index (CFI) > 0.95 and McDonald's Omega of 0.78 and 0.68 these findings supported its validity (Manzar, 2019). PSS 10 was also found to have a moderate reliability with Cronbach alpha of 0.7 in young women in South Africa (Pakhomova et al., 2021).

The study was conducted in selected antenatal clinics (ANC) in Nairobi County. Health facilities were chosen using a purposive sampling design, including all Level 3 hospitals that served over 700 antenatal clients. From these, two hospitals, Makadara Health Centre and Mathare North Health Centre, were randomly selected. Client sampling followed a stratified sampling approach method in which the antenatal women were divided into two groups: first-time clinic visitors (new clients) and returning clients. Systematic sampling was then applied, selecting every third pregnant woman for participation. The final sample size was 274 pregnant women. Descriptive data analysis was done to determine prevalence of prenatal stress.

Results

Table 1: Characteristics of Participants

Respondent's characteristics	
1st visit	74 (28%)
Revisit	190 (72%)
Total	264 (100%)
Social demographic data	
Maternal age	
15-24 Years	125 (47.35%)
25-34 Years	130 (49.24%)
35 and above	9 (3.40%)
Marital Status	
Married	224 (84.85%)
Single	35 (13.26%)
Divorced	1 (0.38%)
Cohabiting	2 (0.76%)
Separated	2 (0.76%)
Level of education	
Primary School	49 (18.56%
Secondary School	129 (48.86%)
Tertiary	89 (33.71%)
Work status	
Employed	56 (21.21%)
Self-employed	63 (23.86%)
Unemployed	145 (54.92%)
Parity	
First Pregnancy	110 (41.67%)
2nd – 5th pregnancy	149 (56.44%)
6th and above pregnancy	5 (1.89%)

Out of the calculated sample size of 274, a total of 264 respondents completed the questionnaire, yielding a response rate of 96.35%. Among these, 28% were first-time visitors, while 72% were revisits. Most respondents were aged between 25 and 34 years 49.2% married 84.9%, those who had completed secondary education were 48.9%, and were unemployed 54.9%. Regarding parity, 56.4% of the respondents were on their 2nd to 5th pregnancy.

Prevalence of Prenatal Stress

The prevalence of prenatal stress among pregnant women in selected ANC clinic was 48.9%, meaning that almost half the number of respondents in this study had prenatal stress. In order to better understand this prevalence, certain socio-demographic characteristics of the participants' maternal age, marital status, educational level, work status and parity were analyzed. Table 2 presents the prevalence against these specific demographics.

Table 2: Prevalence of Prenatal Stress against Demographic Data

Stress assessment	Without prenatal stress	With Prenatal stressed
All respondents	135 (51.1%)	129 (48.9%)
Maternal age		
15-24 Years	65(52.0%)	60(48.0%)
25-34 Years	68 (52.3%)	62 (47.69%)
35 and above	2 (22.2%)	7 (77.78%)
Marital Status		
Married	120 (53.57%)	104 (46.43%)
Single	13 (37.14%)	22 (62.8%)
Divorced	1 (100%)	
Cohabiting	0	2 (100%)
Separated	1 (50%)	1 (50%)
Level of education		
Primary School	19 (38.78%)	30 (61.22%)
Secondary School	75 (58.14%)	54 (41.86%)
Tertiary	41 (47.67%)	45 (52.33)
Work status		
Employed	32 (47.14%)	24 (42.86%)
Self-employed	37 (42.86%)	36 (57.14%)
Unemployed	76 (52.41%)	69 (47.59%)
Parity		
First Pregnancy	62 (56.36%)	48 (43.64%)
2^{nd} – 5^{th} pregnancy	72 (48.22%)	77 (51.68%)
6^{th} and above pregnancy	1 (20%)	4 (80%)

Table 2 demonstrates that prevalence of prenatal stress among pregnant women in selected ANC clinic was 48.9%, meaning almost half the number of respondents in this study had prenatal stress. In order to understand the foregoing prevalence in detail, certain socio-demographic characteristics

of the participants deemed to be contributory were analysed. These are maternal age, marital status, educational level, work status and parity.

Maternal Age

The findings showed that respondents who were above 35 years had the highest prevalence of stress indicated by 77.78% that is 7 out of 9 respondents had prenatal stress. The respondents who were between the ages of 15 to 24 years had a prevalence of 48.00%. The age group that had the lowest prevalence of prenatal stress of 47.69% were between 25-34 years. The analysis indicates that, prenatal stress varies with maternal age. The study showed that pregnant women who were 35 years and above had higher prevalence of prenatal stress compared to those who were below 35 years. This study sought to establish the marital status of the respondents in the categories of married, single, divorced, cohabiting or separated and their stress level.

Marital status

Table 2 indicates respondents who were cohabiting had 100% prevalence of prenatal stress, even though they were only two, both of them were stresses. Respondents who were single followed with a prenatal stress prevalence of 62.86% and they were 22 in number. The finding revealed that 104 married respondents had prenatal stress with a prevalence of 46.43%. Respondents who were separated were only two, where one of them had prenatal stress and the other one did not have, so the prenatal stress prevalence was 50%. Only one respondent was divorced, and she had no stress, showing 0% prevalence of stress. The analysis displayed that, pregnant women who are cohabiting and those who are single are more likely to suffer from prenatal stress even through cohabiting were very few in number.

Level of education

Respondents who had primary school level education had the highest prevalence of prenatal stress presented by 61.22%. Those who were in tertiary level followed with a prevalence of 52.33%. The respondents who were in secondary level had the lowest prevalence of prenatal stress of 41.86%. The analysis depicts that, the level of education had a “U” shaped effect, where respondents with lowest level of education and those who had highest level of education had higher prevalence of prenatal stress, compared to those who had middle level of education.

Work Status

The finding indicated that, respondents who were self-employed had the highest prevalence of prenatal stress, represented by 57.14%. Those who were unemployed followed with a prevalence of 47.59%. Respondents with the lowest prevalence were those who were employed, represented by 42.86%. The analysis showed that those who were self-employed were more likely to suffer from prenatal stress compared to those who were employed and unemployed.

Parity

Parity was used to explain the number of pregnancies each respond had carried represented by Primigravida (1st pregnancy), Multigravida (2nd to 5th pregnancy) and Grand-multiparas (6th and above) and prenatal stress. The analysis showed that grand multiparas had the highest prevalence of prenatal stress of 80% but the respondents were only 4. They were followed by those multigravidas at a percentage of 51.68% and primigravidas had the lowest prevalence at 43.64%. The analysis indicated, the higher the number of pregnancies a woman had carried, the higher the chances of suffering from prenatal stress.

Discussion

Prenatal stress is a common occurrence during pregnancy and can cause various adverse effects including but not limited to preterm deliveries, low-birth weight and pre-eclamsia. In this study, the findings showed that, the prevalence of prenatal stress among respondents in selected ANC clinics in Nairobi County was 48.9%. This was within the worldwide range which was 5.5% to 78% (Boekhorst et al. 2021). The prevalence was lower than a study done in Iran and Malaysia which was 91.8% and 75% respectively (Deo et al., 2020, Keramat et al., 2021). The finding of this study was higher than studies done in Africa, for instance, Ghana and Ethiopia had a prevalence of 28.6% and 11.6% respectively (Boakye-Yiadom et al., 2015; Engidaw et al., 2019). The disparities were probably attributed to environmental and cultural differences in those countries. High prevalence in this study might also have been due to the timing because data collection was done immediately after Kenya's general elections, meaning that the country's political instability may have influenced the responses.

A study done in Kenya by Andhavarapu et al. (2021) revealed a prenatal stress prevalence of 75.4% which is higher than the finding in this study. This disparity was probably because the study was done in Migori County which is in a rural setting while this study was done in Nairobi County which is in an urban setting. The disparities were probably because of the environmental, social, and cultural differences in rural and urban areas. In addition, the study done in Migori only assessed prenatal stress among pregnant women who had experienced IPV which could have increased their stress levels. However, the current study assessed prenatal stress among all pregnant women attending routine ANC clinic regardless of their experiences.

Maternal age, parity, level of education and work status were found to be significant characteristics which contributed to prenatal stress. In this study women who were 35years and above had the highest prevalence of prenatal stress of 77.78%. Depicting that older women had higher chances of suffering from prenatal stress compared to younger pregnant women. The findings were most likely due to sample size, where respondents who were over 35 were only 9 in number, 7 of them had prenatal stress, hence increasing the prevalence. However, this finding was similar to a study by Boakye-Yiadom et al. (2015) which showed that, age was positively correlated with prenatal stress. This may be explained by a possibility that, women who are over 35 years may have had other children to care for, which can overwhelm them and increase their stress levels. On the contrary, a study done by Arch (2013) showed that, younger age was directly associated with prenatal stress, where women below 20 years had high prevalence of prenatal stress.

Regarding marital status, the study showed that respondents who were cohabiting and those who were single had high prevalence of prenatal stress of 100% and 62.9%, respectively. This showed that, the likelihood of suffering from prenatal stress was higher in pregnant women who were cohabiting or single compared to those who are married, divorced or separated. This was supported by study a by Guardino and Schatter (2014), which stated that single pregnant women had heightened level of prenatal stress than those who were married. The high level of stress made these single women to have higher risk of preterm births. This was supported by GAS theory which revealed that stress negatively affect physiological status of a pregnant woman leading to preterm births. Singlehood was also a predictor of prenatal stress may be because single pregnant women, might lack social support from their intimate partners. They may also be the sole breadwinners forcing them to work extra hard to provide for their families. Cohabiting respondents had a high

prevalence of stress probably because, of the low sample size, they were only two in number and both of them had prenatal stress. Another reason could be associated with the fact that cohabiting women might be insecure or have uncertainty about their marital status.

The findings of this study displayed parity as an important predictor of prenatal stress. The results showed that, the higher the number of pregnancies the higher the level of prenatal stress. Grand-multiparas had the highest prevalence of stress followed by multiparas and primi-gravida had the lowest prevalence. This study was similar to a study in Ethiopia which showed that, the likelihood of developing stress in pregnancy as woman who had more than one pregnancy was 3.96 times higher than primigravida women (Deksisa et al., 2020) This was probably because, multiparas women may have undergone undesirable experiences during their previous pregnancies, labour or delivery. Consequently, they might anticipate experiencing the same problem during the current pregnancy which increase their level of prenatal stress. To affirm that, in this study, respondents were told to write down what was making them get stressed and overwhelmed. One of the respondents wrote that, she lost her baby during the delivery of her previous pregnancy, and she was not told the cause of death. She reported that, she is stressed and overwhelmed because she is afraid the same thing might happen to her unborn baby.

Another significant predictor of prenatal stress was the work status of the respondents. Where those pregnant women who were self-employed had higher prevalence of prenatal stress compared to those who were unemployed and those employed. A study done by Tang et al. (2019) showed a contradicting finding, where Chinese pregnant women who were not employed were 1.82 times more likely to develop prenatal stress than those who were employed and self-employed. Another contradicting study concluded that unemployed Iranian pregnant women had high level of prenatal stress (Alipour et al., 2018). The findings of the current study had difference in the findings possibly because, self-employed respondents are facing challenges because of financial constrains which were experienced in the country after corona virus epidemic. Data collection was also done few months after general election, where business stability had not been achieved, which may be another possible reason.

Level of education was a significant contributor to prenatal stress. This study has shown that, respondents who had primary education level had higher prevalence of stress in comparison to those in secondary and tertiary level. This corresponded with a study conducted by Vijayaselvi et

al., (2015) who stated that women with a lower level of education had a high likelihood of prenatal stress due to lack of knowledge and skills to cope with stress effectively. The finding was also supported by Transactional Model of Stress and Coping theory which stated that, the level of stress can reduce when an individual has knowledge and skills to deal with stressful situations. Assuming that education can give this knowledge and skills. On the other hand, a study by Andhavarapu et al. (2021), revealed that there was no statistically significant relationship between the level of education and prevalence of prenatal stress, which was contrary to the findings of the current study.

Conclusion

Prevalence of prenatal stress among pregnant women in selected ANC clinic in Nairobi County was high at 48.9%. Meaning that almost half of all women who attended ANC clinic had prenatal stress predisposing them to preterm births. We strongly recommend an assessment of prenatal stress during routine ANC visits and an intervention plan to be introduced in order to mitigate the situation.

It is recommended that prenatal stress assessment can be integrated in the antenatal package of care to enable risk-specific interventions. Additionally, pregnant women should be psycho-educated on the importance of seeking psychological support. Finally, the PSS 10 should be translated to Kiswahili to ensure consistent assessment across diverse populations in Kenya.

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