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Research Article

Assessment of perceived stress amongst primigravidae attending an ante natal clinic in Kano, Nigeria

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ABSTRACT

Pregnancy is an important life event for the woman and is often accompanied by many positive changes and events in anticipation of motherhood; especially for primigravidae. However, the physical, physiological, psychological changes and socio-cultural events related to pregnancy qualify pregnancy as a potent stressor. Stress reactivity during pregnancy may increase the risk of spontaneous abortion, low birth weight and development of mental illness in the offspring. This risk may constitute a big burden in our society considering the high pregnancy and birth rate typical of our society; and such data including for primigravidae is very scanty. This study aims to assess perceived stress amongst primigravidae in our local environment and relate it to socio-demographic and clinical characteristics. We hypothesized, that primigravidae in our local environment will have significant perceived stress. A total of 120 primigravidae were recruited in a cross-sectional study in an antenatal clinic of an urban hospital in Kano city, northern Nigeria. Socio-demographic and clinical information was obtained during ~~an~~ interview and physical examination. Perceived stress was assessed using perceived stress score (PSS-10). Data were analyzed using IBM SPSS statistics version 20.0. The median age of the primigravidae was 20.0 (3) years and 93.3% of them fell within the age range of 16-25 years. Most were secondary school educated house wives living above the poverty line with a singleton pregnancy in the third trimester. The median PSS score of the participants was 13 (8), indicating that the primigravidae had low perceived stress. Majority (53.3%) of the participants had low perceived stress, while the rest had moderate perceived stress and none of them had severe perceived stress. Perceived stress score of the subjects was influenced by the presence or absence of twin pregnancy (Chi = 12.05, P = 0.002). The Perceived stress score was not associated with any of the socio-demographic or clinical characteristics ($P > 0.05$). It is concluded that the primigravidae generally had low perceived stress which was influenced by the presence or absence of twin pregnancy and not associated with the socio-demographic or clinical characteristics examined.

INTRODUCTION

Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given time or over a given period (Cohen *et al*., 1983). It includes feeling of uncontrollability and unpredictability of one's life, how often one has to deal with irritating hassles; and confidence in one's ability to deal with life's challenges and problems. hassles; and confidence in one's ability to deal with life's challenges and problems. It is not about measuring the types or frequencies of stressful events which have happened to a person, but rather, how an individual feels about the general stressfulness of their life and their ability to handle such stress (Cohen *et al*., 1983).

Pregnancy, an important life event for the woman, is on one hand ~~is~~ accompanied by many positive changes and events ranging from enhancement of self-esteem to social approval. It is a period of physical, physiological and psychological preparation in anticipation of birth and motherhood. Becoming a parent is considered as one of the maturational milestones of woman's life (Bjelica *et al.,* 2004). On the other hand, the physical, physiological, psychological changes and socio-cultural events occurring in pregnant women qualify pregnancy

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as a potent stressor. The psychological changes during pregnancy depend upon whether the pregnancy was planned or unplanned, wanted or unwanted, achieved in good time or after a long and anxious wait or after medical intervention like *in vitro* fertilization, fear of changes in the relationships such as divorce, and availability of socio-cultural support in raising the child (Glazier *et al*., 2004).

Pregnancy stimulates the physiologic stress response aimed at maintaining homeostasis and the result is usually successful adaptation. However, negative health outcomes can result when the demands posed by the stressor overwhelm an individual's capacity to respond (Shelby and McCance, 2006). Stress reactivity during pregnancy has unique implications for maternal health, birth outcomes, and fetal development. For example, significantly raised catecholamines and cortisol levels may lead to spontaneous abortion during the first trimester (Philipp *et al.,* 2002) or preterm labour (Stenson, 2003; Gopichandran *et al.,* 2010) and low birth weight (Sable *et al.*, 2000). Furthermore, maternal stress and anxiety during pregnancy has been linked to poor neurodevelopmental outcomes of the fetus and even development of mental illness in the offspring (Malaspina *et al.,* 2008; Glover *et al.,* 2009; Charil *et al.*, 2010).

Stress in pregnancy and its potentially negative consequences on the outcome of pregnancy and child health may constitute a yet to be determined societal burden considering the high pregnancy and birth rate typical of our society and such data is generally scanty. Many studies had been conducted on perceived stress worldwide, (Singh *et al.,* 2013; Shah *et al.,* 2010; Iranzad *et al.,* 2014; Ahmed *et al.,* 2017; Brinkley, 2004) but none of such studies was conducted in Nigeria. Moreover, assessment of perceived stress in primigravidae has received little attention. This study aimed to assess perceived stress in primigravidae in our locality and relate it to some socio-demographic and clinical characteristics. We hypothesized that primigravidae in our locality have significant perceived stress.

METHODS

Setting

The study was conducted in the antenatal clinic of Murtala Mohammed Specialist Hospital, Kano. It is a 250-bed hospital that offers healthcare services at primary, secondary and tertiary levels. The study population included all primigravidae attending the antenatal clinic irrespective of maternal and gestational age. Primigravidae with on-going fever and respiratory tract infection, presence or history of mental illness or any chronic disease not related to pregnancy such as hypertension or diabetes were excluded from the study. Every other eligible subject was recruited by systematic sampling to select 120 from a population of about 240 for this descriptive cross-sectional study. Ethical clearance for the study was given by the Health Research Ethics committee, Kano State Ministry of Health, Nigeria. Signed informed consent was obtained from each participant prior to the commencement of the study. The study conformed to the provisions of the declaration of Helsinki 1995 (as reviewed in Tokyo in 2004). These citations are not included in the references

Data collection

Socio-demographic, anthropometric and clinical data were obtained during an interview and physical examination and recorded into a data capture form specially designed for this study. Perceived Stress Scale (PSS 10), which was administered by the investigator to each subject, was employed to obtain the perceived stress score among primigravidae. It measures how an individual feel about the general stressfulness of their life and their ability to handle such stress (Cohen *et al.*, 1983). The scale has scores ranging from 0 to 40 based on response to specific questions and categorizes individuals into three: 0 - 13, 14 - 26 and 27 - 40 representing low, moderate and severe perceived stress, respectively (Cohen *et al.*, 1983).

Statistical Analysis

Data was processed using IBM SPSS statistics version 20.0 (SPSS Inc., IL., USA). Values were summarized using frequencies and percentages or median (and interquartile range). Perceived stress was compared between categories using Kruskal-Wallis test, while the relationship of perceived stress with socio-demographic and clinical characteristics was evaluated using Chi-square test. Values of $p < 0.05$ were considered significant.

RESULTS

Socio-demographic and clinical characteristics of the subjects

The median age of the primigravidae was 20.0 (3) years and 93.3% of them fell within the age range of 16-25 years. Most of them were city-dwelling secondary school educated, unemployed full-time house wives, with family incomes well above the poverty line (2 USD/day) (Table 1).

Most of the primigravidae evaluated had a singleton pregnancy in the third trimester, with mostly normal

BMI and presented with different complaints such as nausea and tiredness (Table 2).

Table 1: Variation of perceived stress according to socio-demographic characteristics of the subjects

Characteristics	PSS Score	Frequency (%)	Test of significance
Age (years)			
16 – 25	13.00 (7)	112 (93.3)	Chi = 0.110
26 – 35	11.00 (14)	8 (6.7)	df = 1
36 – 45	-	0 (0.00)	P = 0.740
Level of education			
Primary	10.00 (8)	17 (14.2)	Chi =3.448
Secondary	13.00 (8)	97 (80.8)	df = 2
Post-secondary	10.50 (6)	6 (5.0)	P = 0.178
Occupation			
Full-time house wife	14.00 (7)	64 (53.3)	Chi = 2.242
Self-employed	12.00 (8)	55 (45.8)	df = 2
Civil servant	20.00	1 (0.8)	P = 0.298
Area of residence			
Urban	13.00 (8)	112 (93.3)	Chi = 0.038
Semi –Urban	14.00 (11)	6 (5.0)	df = 2
Rural	11.00	2 (1.7)	P =0.981
Family Income (per month)			
₦0.00 – 10,999 (1USD/day)	-	0 (0.00)	Chi = 2.417
₦11,000 – 21,999 (2USD/day)	11.00	2 (1.7)	df = 2
₦22,00 – 43,999 (4USD/day)	14.00 (11)	43 (35.8)	P =0.299
₦44,000 – above (>4USD/day)	12.00 (8)	75 (62.5)	

Table 2: Variation of perceived stress according to clinical characteristics of the subjects

Characteristics	PSS Score	Frequency	Test of significance
Body-mass index			
Less than 18.5	12.50	2 (1.7)	Chi = 0.235
18.50 – 24.99	13.00 (8)	83 (69.2)	df = 3
25.00 – 29.99	13.00 (8)	25 (20.8)	P = 0.972
30 – and above	14.00 (10)	10 (8.3)	
Gestational age			
First trimester		1 (0.8)	Chi = 1.631
Second trimester	14.0 (9)	13 (10.8)	df = 2
Third trimester	12.50 (8)	106 (88.3)	P = 0 .442
Number of fetus			
Unknown	10.00 (7)	35 (29.2)	Chi = 12.055
Single	14.00 (8)	84 (70.8)	df = 2
Twin	20.00	1 (0.8)	P = 0.002
Pregnancy complaints			
Nil	11.00 (8)	35 (29.2)	Chi = 9.647
Nausea	10.50 (7)	16 (13.3)	df = 6
Vomiting	11.00 (11)	7 (5.8)	P = 0.140
Fatigue	14.00 (11)	12 (10.0)	
Tiredness	10 (9)	16 (13.3)	
Others	14.00 (2)	11 (9.2)	
Combination	15 (6)	23 (19.2)	

Level of perceived stress among the subjects

The median PSS score of the **subjects** was 13 (8), indicating that the primigravidae had low perceived stress. Evaluating the **subjects** along perceived stress categories, the majority (53.3%) of the **subjects** had low perceived stress, while the rest had moderate perceived stress and none of them had severe perceived stress (fig. 1).

There was significant difference in stress score of the women according to the number of fetuses in the pregnant uterus (Chi = 12.05, *P* = 0.002) (Table 2). Primigravidae with singleton pregnancy were in the majority - 70.8% and the only one with twin pregnancy had PSS score of 14 (8) and 20, respectively, which were within the range of moderate perceived stress. The category of primigravidae with unknown status had PSS score of 10 (7), which indicated low perceived stress. There was however, no difference in perceived stress based on the trimester of pregnancy or the presenting complaints. There was also no significant variation of perceived stress with socio-demographic characteristics (Table 1).

There was no association between perceived stress and any of the socio-demographic or clinical characteristics examined (Table 3).

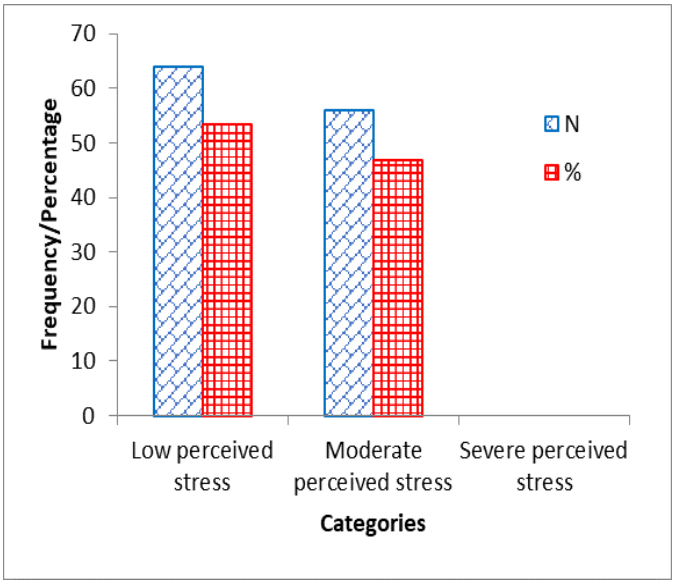

Figure 1: Distribution of perceived stress among the subjects

DISCUSSION

This study assessed perceived stress among 120 women within the age range of 16 – 25 years who were having their first pregnancy in a hospital setting. The subjects in this study were found to have low perceived stress. Low perceived stress is the lowest score category of the PSS-10 scoring (Cohen *et al.*, 1983) and is considered a normal finding because there is always some level of stress in normal life situations. The low perceived stress could be explained by fact that most of the subjects (88.3%) were in their third trimester of

gestation, when they are expected to have adapted to pregnancy related changes, which was also supported by the fact that a good proportion of them (29.3%) had no pregnancy-related complaints at the time of the study. Indeed, it has been reported that during the third trimester of pregnancy there is reduction of most of the potential stressors, such as nausea, headache and vomiting (Lee and Saha, 2011).

Table 3: Relationship of perceived stress with socio-demographic and clinical characteristics of the subjects

Characteristics	Test of relationship	
	Chi sq.	P value
Socio-		
Age	0.289	0.591
Level of education	2.685	0.261
Occupation	2.741	0.254
Family incomes	4.881	0.087
Area of residence	0.038	0.981
Pregnancy characteristics		
Duration of pregnancy	2.112	0.348
Number of fetuses	5.510	0.064
Pregnancy complaints	11.210	0.082
Anthropometric characteristics		
BMI	0578	0.902

The level of perceived stress of the primigravidae was influenced by their awareness of the number of fetuses they carried in the pregnant uterus. The majority (70.8%) of them who were carrying singleton pregnancy, presented with moderate perceived stress, while those who were unaware (29.2%) of this information had low perceived stress. This might have to do with the knowledge of the sex of the fetus which could be the one not preferred by the expecting mothers. This finding corroborates previous reports that gender preference for the baby, a male child over a female, has been reported as a risk factor for postpartum depression in many studies especially from the developing world (Parcells 2010; Cohen *et al*., 1983). The woman with twin pregnancy in this study had the highest perceived stress score, apparently in anticipation of additional twin-related challenges she would be confronted with.

This study reported no influence of both presenting complaints and trimester of pregnancy on the perceived stress level of the women. This could be because most of the subjects (88.3%) fell under one category (trimester of pregnancy). This finding is contrary to that of Goyal *et al*. (2017), who reported that women in third trimester were more stressed compared to those in second trimester.

There was neither influence, nor association between perceived stress and any of the socio-demographic characteristics examined. We did not observe influence age on perceived stress probably because most of the primigravidae were young adults within the age range of 16-25 years and there were very few older adults among them. Had there been a good number of older adults (in the older age categories), we could have observed a variation in perceived stress due to age. This is in line with the report of D'Zurilla *et al.,* (1998), who suggested that older adults tend to adopt problem-solving coping strategies and have more effective coping resources. They also indicated that as people mature, they became better able to adapt to a range of behavioral, cognitive and emotional strategies to cope with stressful life events. Another explanation is that older adults may engage in a more differentiated approach to problematic situations by using diverse strategies in handling stress. In addition, having had a stressful encounter previously, influences an individual's capability to solve the same or a related situation when it comes (Hamarat *et al*., 2001).

The present study also found no significant relationship between perceived stress and various socio-demographic characteristics. This could result from the fact that, most of the primigravidae were city-dwelling, full time house-wives who were not gaining additional stress outside the comfort of their home and who had family income above poverty level. This is in line with the findings of Jeyanthi and Kavitha (2008), who reported similar finding on the level of stress among pregnant women.

Pregnancy and childbirth are normal life events, yet women are at the risk of developing significant amount of stress which may be pregnancy-related or due to socioeconomic reasons such as poverty, lack of social support and domestic violence. Many mothers may also experience distress and anxiety simply because they do not anticipate or do not know about the usual psychological disruption, emotional changes and adjustments that are integral to the childbearing process (Fraser and Cooper, 2003). Pregnancy is a phase in women's life with emotional physical and physiological changes. Modern women are exposed to working outside their homes and have to balance between their home, work and their unborn baby. All these may result in stress for them and people around them. To a certain extent, hormonal changes in the body that occur with pregnancy can also be the cause of stress (Liza, 2010).

However, these assertions were not supported by the findings of this study because less than half of the subjects presented with moderate stress and majority of

them had low perceived stress. The absence of severe perceived stress in this study could be due to the fact that, almost all of the subjects were having family income above poverty level and optimum psychosocial support.

Despite the aforementioned risks of developing significant stress during pregnancy, we reported low perceived stress among the women in our study setting. Prevailing socio-cultural practices associated with pregnancy (especially the first pregnancy) in this society such as increased love, care and attention to the woman from the spouse and relatives, improvement in her self-esteem and public image, as well as the fact that most of the women studied were educated urban dwellers who lived above the poverty level and were housewives who did not have to deal with additional stress from work, could be the key reason behind the finding. Our result supports the findings of Marquis and Butler (2001) who reported high level of stress (10% and 40% of high and moderate levels of stress, respectively) among pregnant women with socio-demographic characteristics that are different (opposite) from those in our study (low socioeconomic status, less than 20 years of age, single and no social support). Other studies also reported high perceived stress among pregnant women with unplanned pregnancy and poor psychosocial support (Lau and Yin, 2011; Reeta *et al*., 2015). This finding, though in contrast to the findings of this study, further supports the role for culture-specific factors in stress perception during pregnancy. Other studies also reported strong relationship between social support and level of anxiety among pregnant women (Glazier *et al*., 2004). It will be interesting to know what level of perceived stress further studies will report from our locality but in a rural setting, with lower living standard and education.

The multifactorial nature of stress in pregnancy points to intrinsic pregnancy-related factors such as physiologic changes, poor health condition; and extrinsic socio-cultural and economic factors such as work-related stress, poverty and domestic violence (Fraser and Cooper, 2003). In the present study, majority of the subjects had only mild perceived stress and none of them had severe stress in contrast to previous reports, suggesting that most of these factors did not play a significant role among the subjects. However, a part of the subjects that showed moderate stress could be due to the intrinsic factors (rather than the extrinsic factors) - the physiologic hormonal changes, particularly the stress hormones, that is, corticotrophin releasing hormone (CRH), cortisol and catecholamines. The increased level of CRH in the maternal circulatory system during pregnancy is of placental origin as it is secreted in increasing amounts over the course of the pregnancy, beginning at approximately 16 weeks of gestation and rising exponentially until the time of delivery (Smith *et al.*, 2002). This CRH produced by the placenta plays a central role in the physiology of term and preterm birth, including the length of gestation and the timing of birth (Challis *et al.,* 2002). Furthermore, studies examining the role of placentally-derived maternal CRH levels, in relation to the length of gestation (McLean *et al.,* 1995) have found that elevated levels of CRH early in gestation (16 - 20 weeks) is associated with a higher risk of preterm birth and precedes the occurrence of preterm birth by weeks or even months. These studies suggest that CRH is engaged in an intricate interaction with the endocrine and immune systems of the fetus, mother, and placenta. Unlike the negative feedback system that regulates hypothalamic CRH, placental CRH functions under a positive feedback system, whereby cortisol (maternal and fetal) stimulates rather than inhibits the production of CRH in the placenta (Sandman and Glin, 2009). The interplay of factors contributing to stress in pregnancy can vary depending on the socio-cultural intrinsic biological make-up of the subjects.

CONCLUSION

Based on the aforementioned findings, it was concluded that the primigravidae had low perceived stress as evidenced by median PSS score of 13 (8), with the majority (53.3%) of the subjects having low perceived stress, while the rest having moderate perceived stress and none of them having severe perceived stress. The level of perceived stress was influenced by the number of fetuses but not by the trimester of pregnancy, presenting complaints or socio-demographic characteristics. There was no association between perceived stress and any of the socio-demographic or clinical characteristics examined.

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