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Stress and psychiatric morbidity in working and non-working pregnant women in third trimester

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Abstract

Background: Pregnant women experience dramatic changes both physically and mentally in preparation for birth and breastfeeding. Stress during pregnancy is known to affect the physiological and psycho-social health of the mother and also influences the fetal health. Stress during pregnancy is related to preterm birth (PTB), low birth weight and infant abnormalities. Working women are subject to duties and responsibilities both at home and work place leading to various psychological problems like role-conflict, job strain, mental fatigue and emotional disturbances.

Methods: 150 Pregnant women in their third trimester of pregnancy attending the antenatal clinic of Kempegowda Institute of Medical Sciences, Bangalore were included for the study which consists of 75 working and 75 non-working. The scales used were A to Z Stress Rating Scale, Brief PHQ and semi structured sociodemographic profile.

Results: The mean age with standard deviation was 25.12±2.96 for non working women and 26.84±3.09 for working women. The A-Z Stress Rating Scale (86.71±26.41) and Brief PHQ (12.27±4.16) in working women showed higher scores compared to non-working women which showed A-Z Stress Rating Scale (71.12±32.07) and Brief PHQ (10.09±5.52). They were also statistically significant<0.01.

Conclusion: Using the study findings, it would be a step in the right direction to urge clinicians and policy makers to screen all pregnant women for stress and psychiatric morbidity, in order to ensure better maternal and infant health.

Keywords: Stress, working, non-working, pregnant, third trimester

Introduction

Pregnancy is a period of nine months for which a woman carries a developing embryo in her womb. It is for women a time of great happiness and fulfillment.

Symptoms and discomforts during this period include morning sickness, tiredness, back pain, constipation, peripheral edema, varicose veins, increased urinary frequency, urinary tract infections, hemorrhoids, low blood pressure, heart burn, pelvic girdle pain, breast tenderness and stretch marks.

The third trimester begins in 28th week of pregnancy and lasts until birth, which may be around 40th week of pregnancy. The third trimester sees the completion of a significant number of developmental milestones for the fetus. The complete development of baby's brain and other vital organs such as eyes, lungs, heart, immune system, intestine and kidneys takes place in this trimester.

Since a long time, scientists and doctors were thinking how the mental state of the pregnant woman can affect the growth and development of the unborn child. Today many humans as well as animal projects have been done to understand the same. It can have both immediate and delayed effects on the unborn child.

Primigravida refers to a woman who is pregnant for the first time. Pregnant women experience dramatic changes both physically and mentally in preparation for birth and breast feeding. They undergo a lot of stress during this process. Stress is a state of mental or emotional strain or tension resulting from adverse or demanding circumstances.

Stress during pregnancy is known to affect the physiological and psycho-social health of the mother and also influences the fetal health [1, 2]. Stress during pregnancy is related to pre-term birth, low birth weight and infant abnormalities [3].

Stress in pregnant women is known to vary widely based on external environmental factors like social support, neighborhood, environment, and economic status of women. There are a number of causes for stress. Some of them being divorce, illness or death in family, natural disasters, financial problems, problems from the in-laws, losing a job or home, being abused, being neglected and ill-treated by the society and having serious health problems. Stress may also occur due to insufficient sleep of the pregnant woman.

Stress also may affect the response of the pregnant women to situations. Some deal with stress by drinking alcohol, smoking cigarettes and taking drugs which may lead to pregnancy problems. During the third trimester of pregnancy, women experiences mood swings, reduced interest, anxiety, depression, impatience and introversion.

The antenatal period is when significant fetal neural-development takes place. This period can be altered by various harmful stimuli on the mother [4]. High levels of maternal stress decreases the intelligence quotient of the child, affects the brain development and immune system.

During pregnancy depression has been associated to substance misuse as well as less visits to antenatal clinic [5, 6].

Most women continue working during pregnancy. Working women are subjected to duties and responsibilities both at home and work place leading to various psychological problems like role-conflict, job strain, mental fatigue and emotional disturbances. Stress in workplace can consume energy of the mother which has to be given to the fetus. Various working conditions can increase the risk of complications during pregnancy. These include exposure to harmful substances, prolonged standing, heavy lifting, climbing, excessive noise, heavy vibrations, and extreme temperatures.

Stressful work during pregnancy may lead to prenatal infections, preeclampsia, premature labor, hemorrhage and miscarriage.

Stress during pregnancy

A study reported that high stress levels were seen in women with no or less income, disease, inadequate sleep, irregular eating habits, gestational diabetes mellitus and no support from the family. Women with low socio-economic status, no or less social support, below 20 years of age, and who has studied only till high school are prone to high levels of stress. Studies have shown that one in ten pregnant women have high levels of stress. About 40% are reported to be moderately stressful [7].

A study by Lau Y found out those women with unplanned pregnancy experience stress. Gestational stress tends to increase the risk of pregnancy failure, morbidity and mortality in both mother and child [8].

Studies have shown that implantation site of the fetus may be affected by stress levels altering the uterine contraction and restricting the blood flow [9].

A study published that women experiencing severe anxiety in the third trimester gave birth to babies with higher level of cortisol at birth. Another study concluded that the concentration of cortisol releasing hormone measured in early stage of pregnancy is an indicator of risk of subsequent preterm birth [10, 11].

A study provided indirect evidence that natural disasters like storm, hurricane or earthquake induce stress during pregnancy leading to complication during labor [12].

Anxiety and Depression during pregnancy

Studies have shown that prevalence of antenatal depression and anxiety ranges from 8- 30%. Mothers with depression had 1.8 times higher risk of giving birth to a low-birth-weight child [13].

A study done by D N Marshall stated that anxiety disorders were experienced in pregnancy. It showed that pregnant women are associated with obsessive compulsive disorder and also panic disorders especially in the third trimester [14].

Anxiety in pregnancy will have adverse effects since the autonomic nervous system is stimulated in long-term anxiety problems, which leads to increase in smooth muscle contraction, decreased oxygen in uterus, and abnormal foetal heart rate. [15].

An assessment of data between maternal depression and neonatal outcome showed a high prevalence of pre-term birth, microcephaly, low birth weight and low Apgar score. [16]. Studies indicate that depression after delivery can affect the child's motor, cognitive and emotional development [17, 18].

A study showed that heart variability of the fetus was reduced in mother with anxiety when compared to healthy mother. Anxiety during pregnancy is also associated with poor maternal- child interaction and increased fear of the child in dealing with life events [19, 20]. Maternal stress, anxiety, depression affect the fetal heart rate, sleep patterns, neurological development and activity [21].

Prevalence of disorders of anxiety during pregnancy are 10% and 25% in developed and developing country respectively [22].

A few studies concluded that having psychiatric symptoms during gestation is highly related to mental disturbances before pregnancy and these disturbances may increase present neurotic symptoms [23].

Work affecting during pregnancy

Studies have shown that working women generally have poorer mental health and higher level of depression compared to non working women [24].

A study reported that work stress along with pregnancy demands induced greater depression and anxiety in working women than non working women [25].

Working for more than 40 hours/week was associated with high rates of 12% pre term delivery and 22% small for gestational age which significantly increased with high work stress. Working for more than 32 hours/week is as risky as smoking during pregnancy.

Hundred percent of the people having problem with their workplace had abnormal delivery. This study also stated that socio demographic factors had a significant influence on pregnancy outcome [26].

Another study concluded that working antenatal mothers have developed more stress than non working antenatal mothers [27]. Stressful work like physical or physiological work increases the risk of preterm delivery, low birth, pre eclampsia, etc. [28]. Working pregnant women belonging to lower socioeconomic class suffered more depression and anxiety due to negative attitude among relatives.

A study stated that education played a protective role against antenatal anxiety and depression. Less education of housewives was associated with higher levels of anxiety and depression when compared to educated working women.

In a comparative study between multigravida and primigravida, there was significant relationship related to anxiety but no significant relationship related to stress level and socio-demographic status [29].

Urban health Research has demonstrated that the complexities of urban areas can affect the pregnant women. High urban social stress would significantly predict lower mental and physical quality of life during pregnancy and postpartum^[30].

Aims and objectives

The Objective of the study is to determine stress levels and to screen for mental illnesses of pregnant working women and compare them with pregnant non working women.

Material and Methods

Pregnant women in their third trimester of pregnancy attending the antenatal clinic of Kempgowda Institute of Medical Sciences, Bangalore were included for the study. 150 Pregnant Women were included for the study,

- 75 Working
- 75 Non-Working

Ethical approval was obtained from the Institutional Ethics Committee before commencement of the study.

After due Informed Consent, they were recruited for Study related assessments. All data collected were kept confidential. Non consent for the study in no way hindered the standard of care they were to receive. They were assured that they can withdraw consent at any time during the study. Depressed women were referred for counseling and further management.

The Scales used were

Semi structured Socio-demographic profile

It included age, area of residence, education qualification, work status, husband's work status, any psychiatric illness and habits.

A to Z Stress Rating Scale

This scale is to assess the stress during pregnancy. This is a scale developed specially for pregnant women in South Asian population. It consists of 30 items. The items consisted of family-related concerns (husband, children, in-laws and parents), socioeconomic concerns and pregnancy-related concerns. This scale is coded on "yes/ no" format, with weighed scores for different questions, lending a total score of 179.

Brief-PHQ

It is an abbreviated version of Patient Health Questionnaire (PHQ), which can be used to screen for Depression, Anxiety Disorders, Somatoform disorders and Post Traumatic Stress Disorder. This scale is calculated by assigning score 0, 1, 2, 3 to the response category 'not at all', 'several days', 'more than half the day', and 'nearly every day' respectively. This consists of 9 items, with score ranging from 0-27. This is a self-rated questionnaire, which was read out to the patients and coded, if patient was illiterate.

Interpretation of the total score

PHQ-9 Score	Depression Severity
0-4	None-Minimal
5-9	Mild
10-14	Moderate
15-19	Moderately Severe
20-27	Severe

Inclusion criteria

1. Pregnant women between the age of 20 and 40 years.
2. Only Primigravida subjects with gestation age of 29-32 weeks were taken.

Exclusion criteria

- 1) Complicated Pregnancy (Pre-eclamptic toxemia)
- 2) Pregnancy with Comorbidities (pre existing Diabetes Mellitus, Hypertension, current major psychiatric illnesses)

Statistical Analysis

Data obtained in this study was analyzed statistically by computing descriptive statistics as mean and standard deviation.

The difference in means between the two groups was tested statistically using student's t-test. T-test was used to compare equality of mean between non-working and working pregnant women and significant difference were observed 5% level of significance. Chi-square test was used for comparing the presence of anxiety between non-working and working women and significant difference was observed 5% level of significance. The difference was considered statistically significant whenever p is less than or equal to 0.01. The data was analyzed by using:

- t-test: Excel function
- Chi square:
https://www.medcalc.org/calc/comparison_of_proportions.php
- Graphs: Excel

Results

The study included 150 pregnant women, 75 working and 75 non-working pregnant women fulfilling the inclusion and exclusion criteria.

The youngest of the pregnant women was 20 years and the eldest was 34 years.

The mean age with standard deviation was 25.12±2.96 for non-working women and 26.84±3.09 for working women. Both the A-Z Stress Rating Scale (86.71±26.41) and Brief PHQ (12.27±4.16) in working women showed higher scores compared to non-working women which showed A-Z Stress Rating Scale (71.12±32.07) and Brief PHQ (10.09±5.52). They were statistically significant, p<0.01. (Table 2)

Majority of the women 49(65.33%) non-working and 56(74.67%) working were from the semi-urban areas. 45(60%) working women were graduates, while among the non-working women, 39(52%) had studied up to high school, and 20(26.67%) had finished their graduation. Amongst the working women, 28(37.33%) professionals, 23(30.67%) skilled workers, 21(28%) semiskilled and 3(4%) manual laborers. 34(45.33%) of the husbands of non-working women were skilled workers while 35(46.67%) and 26(34.67%) of the husbands of working women were skilled workers and professionals respectively. 15(20%) of non-working women and 3(4%) of working women presented with anxiety. The Brief PHQ showed depression severity of non-working women who had minimal (17.33%), mild (29.33%), moderate (30.67%), moderately severe (16%) and severe (6.67%) depression whereas working women had minimal (2.67%), mild (17.33%), moderate (52.00%), moderately severe (21.33%) and severe (6.67%) depression. The A-Z Stress Rating Scale scores were divided into 6

groups with a range of 29-unit scores in each group. (Table 1)

When Brief PHQ was compared among different categories, the pregnant women showed statistical significance above the age of 25 years and did not show significance below or equal to 25 years, women residing in non-urban areas showed statistical significance and residing in urban areas showed no significance and based on education qualification, significance was found between the two groups in graduates as well as non-graduate population. (Table 3)

When A-Z Stress Rating Scale was compared among different categories, the age of the pregnant women showed

slight significance above the age of 25 years and also showed significance below or equal to 25 years, women residing in non-urban areas showed statistical significance and residing in urban areas showed no significance and based on education qualification significance was found between the two groups in graduates as well as non-graduate population. (Table 4)

When presence of anxiety was compared among different categories, no significant difference was observed except in age group less than or equal to 25 years and non-graduate pregnant women. The urban area had no working women with the presence of anxiety and 38.10% non-working women in urban areas presented with anxiety. (Table 5)

Table 1: Descriptive statistics for qualitative variables in socio demographic profile, Brief PHQ, A-Z Stress Rating Scale and presence of Anxiety

Qualitative Variable	Not Working (N=75)		Working (N=75)	
	Frequency	%	Frequency	%
Area of residence - n (%)				
Rural	5	6.67	5	6.67
Semi Urban	49	65.33	56	74.67
Urban	21	28.00	14	18.67
Education - n (%)				
Illiterate	3	4.00	1	1.33
Primary	13	17.33	3	4.00
High School	39	52.00	26	34.67
Graduate	20	26.67	45	60.00
Work Status - n (%)				
Not Working	75	100.00	NAP	NAP
Manual Labourer	NAP	NAP	3	4.00
Semi Skilled	NAP	NAP	21	28.00
Skilled	NAP	NAP	23	30.67
Professional	NAP	NAP	28	37.33
Husband Occupation - n (%)				
Manual Labourer	2	2.67	3	4.00
Semi Skilled	21	28.00	11	14.67
Skilled	34	45.33	35	46.67
Professional	18	24.00	26	34.67
Brief - PHQ - n (%)				
None – Minimal	13	17.33	2	2.67
Mild	22	29.33	13	17.33
Moderate	23	30.67	39	52.00
Moderately severe	12	16.00	16	21.33
Severe	5	6.67	5	6.67
A-Z Stress Rating Scale Sum – n(%)				
0-29	8	10.66	0	0
30-59	19	25.33	10	13.33
60-89	23	30.66	23	30.66
90-119	22	29.33	37	49.33
120-149	3	4	5	6.67
150-179	0	0	0	0
Anxiety	15	20.00	3	4.00

Table 2: Descriptive statistics (Mean (SD)) for quantitative variables in socio demographic profile, A-Z Stress Rating scale and Brief PHQ

Quantitative variable	Not Working (N=75)		Working (N=75)		P
	Mean	SD	Mean	SD	
Age	25.12	2.96	26.84	3.09	<0.01
A to Z Stress Rating	71.12	32.07	86.71	26.41	<0.01
Brief PHQ	10.09	5.52	12.27	4.16	<0.01

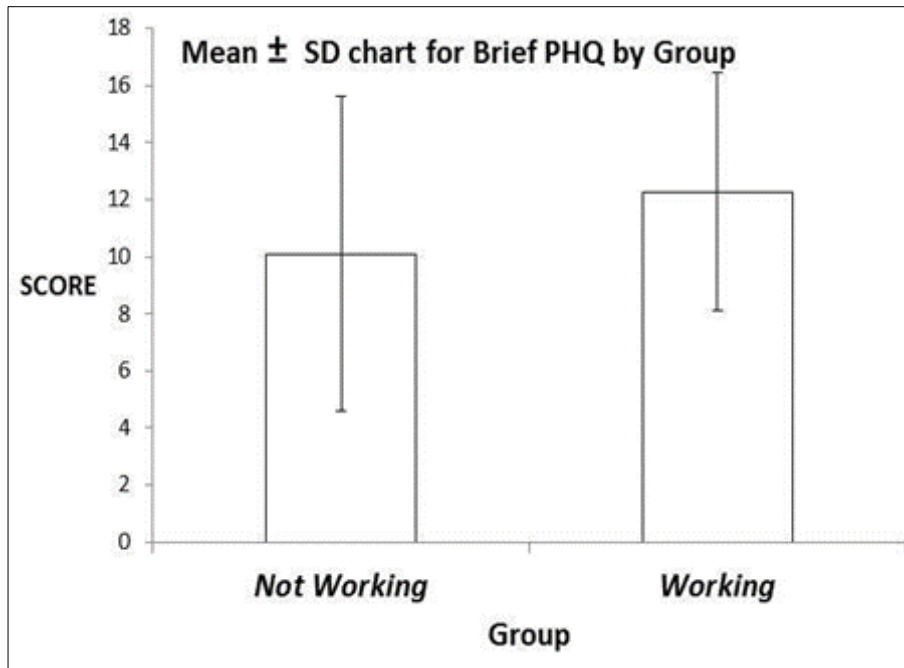


Fig 1: Showing the Brief PHQ in working women (12.27±4.16) had higher scores compared to non working women (10.09±5.52)

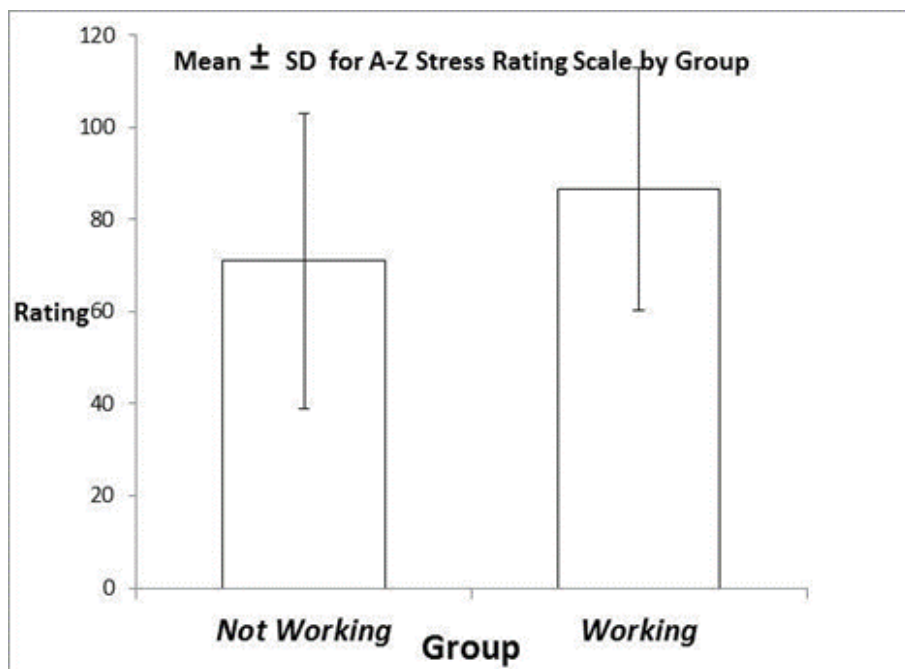


Fig 2: Showing A-Z Stress Rating Scale in working women (86.71±26.41) had higher scores compared to non working women (71.12±32.07)

Figure 3. shows Brief PHQ scores under different depression severity. It showed that working women had higher psychological distress of 39(52%) having moderate

and 16(21.33%) having moderately severe compared to non-working pregnant women having 23(30.67%) moderate and 12(16%) moderately severe

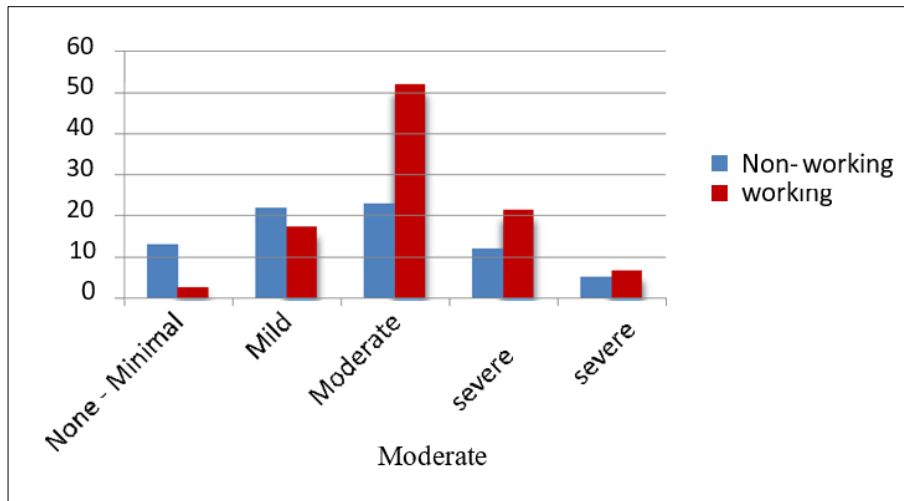


Fig 3: Showing the comparison Depression severity of Brief PHQ

Figure 4. shows total scores of A-Z Stress Rating Scale. It showed that working women had higher stress of

37(49.33%) having stress score in range of 90-119 compared to non working in the same had 22(29.33%).

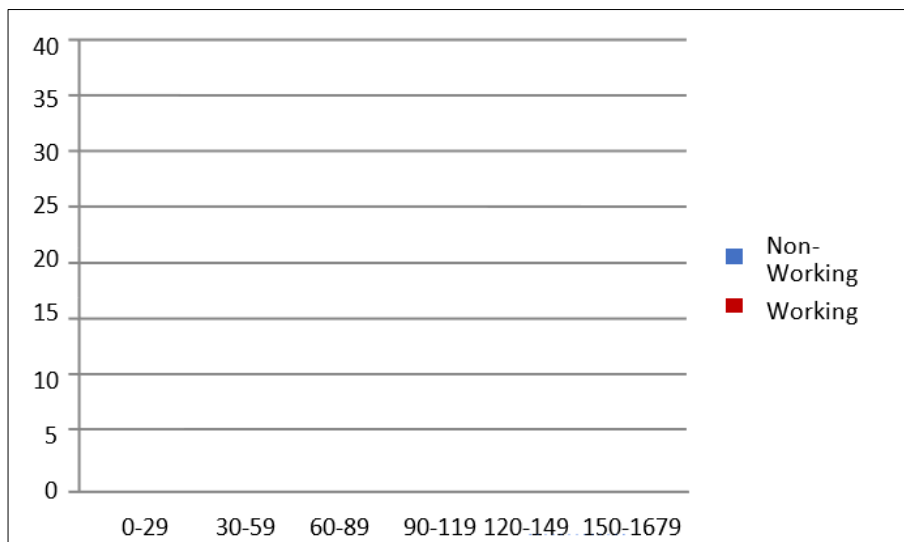


Fig 4: Showing the comparison Total score of A-Z Stress Rating Scale

Table 3: Brief PHQ comparison among different categories

Grouping	Not Working (N=75)			n	Working (N=75)		P – Value
	N	Mean	SD		Mean	SD	
Age							
≤ 25	43	10.77	5.64	28	12.43	4.67	0.09 **
> 25	32	9.19	5.31	47	12.23	3.84	<0.01
Area of residence							
Urban	21	13.43	4.46	14	12.71	4.23	0.32 **
Others	54	8.80	5.37	61	12.21	4.15	<0.01
Education							
Graduate	20	8.10	4.38	45	11.49	4.10	<0.01
Others	55	10.82	5.74	30	13.53	3.95	<0.01

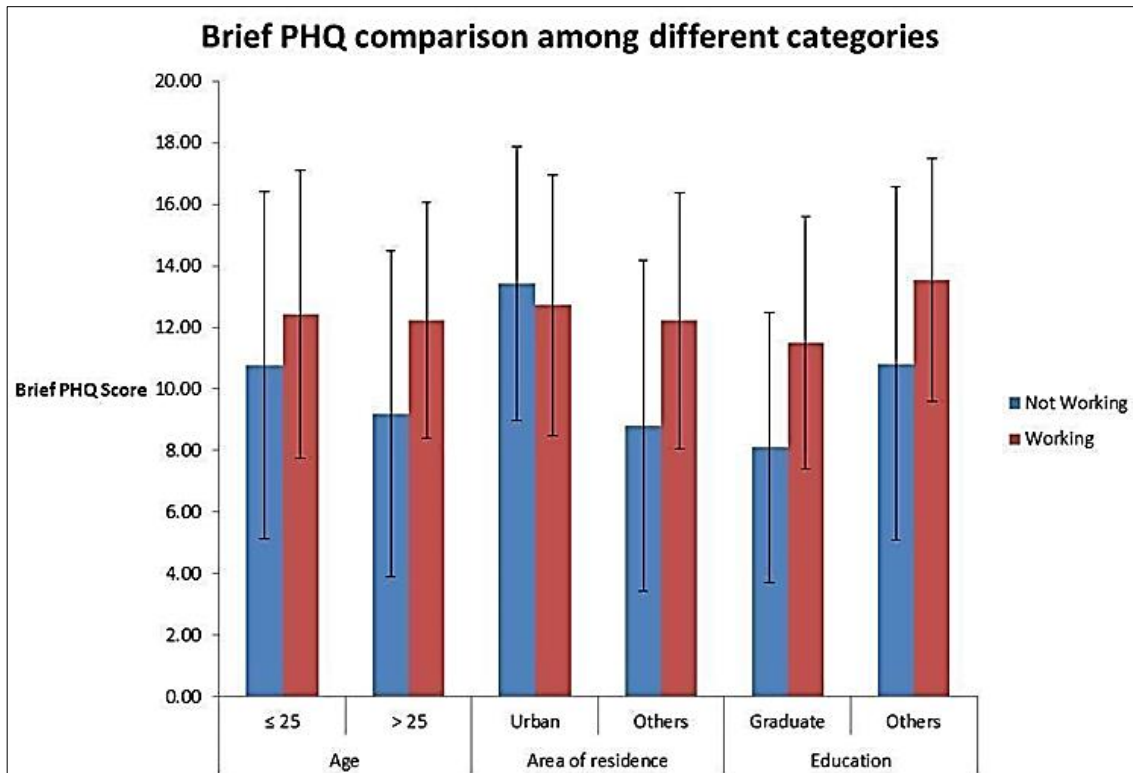


Fig 5: Brief PHQ comparison among different categories

Table 4: Stress test rating comparison among different categories

Grouping	Not Working			n	Working		SD	P – Value
	n	(N=75) Mean	SD		(N=75) Mean			
Age								
≤ 25	43	71.23	35.56	28	90.96	24.99	<0.01	
> 25	32	70.97	27.25	47	84.17	27.17	0.02	
Area of residence								
Urban	21	98.48	20.58	14	90.00	22.22	0.07**	
Others	54	60.48	29.40	61	85.95	27.39	<0.01	
Education								
Graduate	20	48.55	18.96	45	76.51	25.63	<0.01	
Others	55	79.33	32.03	30	102.00	19.50	<0.01	

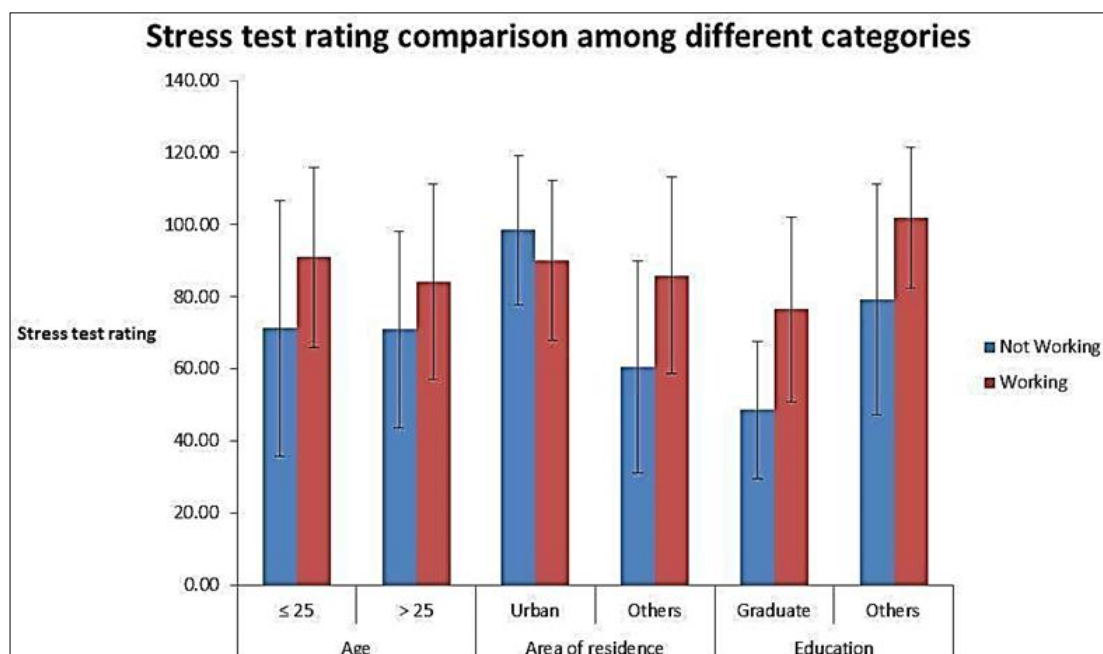


Fig 6: A-Z Stress Rating Scale comparison among different categories

Table 5: Presence of Anxiety comparison among different categories

Grouping	Not Working			Working			P - Value
	N	Working (N=75)		n	(N=75)		
		Frequency	%		Frequency	%	
Age							
≤ 25	43	11	25.58	28	1	3.57	0.02
> 25	32	4	12.50	47	2	4.25	0.18**
Area of residence							
Urban	21	8	38.10	14	0	0.00	-
Others	54	7	12.96	61	3	4.92	0.13**
Education							
Graduate	20	1	5.00	45	1	2.22	0.55**
Others	55	14	25.45	30	2	6.66	0.04

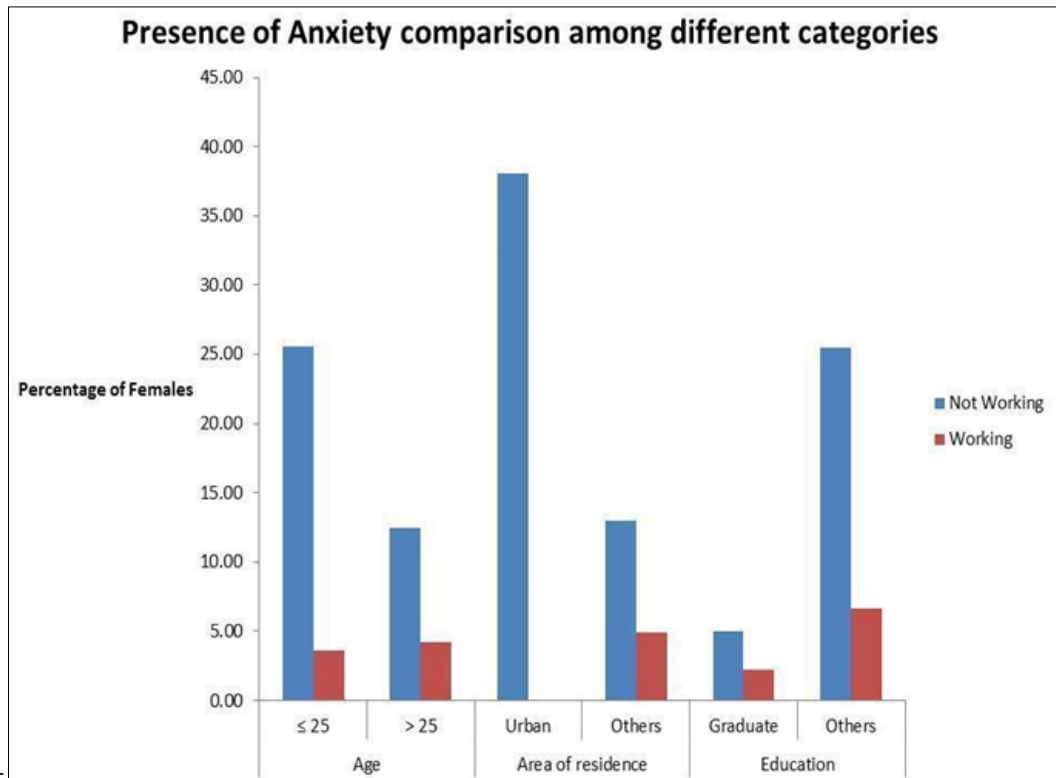


Fig 7: Presence of Anxiety comparison among different categories

Discussion

Almost all women experience stress at some point during pregnancy. Stress during pregnancy is often unavoidable. Normal levels of stress are unlikely to affect the health of a pregnant woman but excessive stress can cause harmful effects on the health of the unborn child.

This has been a study using structured scales assessing psychological distress/illness and stress during pregnancy. Brief PHQ is a well validated scale to pick up psychological ailments like depression and anxiety. This scale showed more distress in the sample of working than non working women.

A-Z Stress Rating Scale has been validated in Asian sample to identify stress in pregnant women. This scale also showed working women to be having more stress than their non working counterparts.

The results from the present study which determines the stress levels of pregnant women by using A to Z Stress Rating Scale and Brief PHQ are:

- Stress levels between working and non-working shows that high percentage of working women are moderately

to severely stressed while non-working women are mildly stressed.

- Correlation between the age of the pregnant women shows that women above the age of 25 years are more stressed when compared to women who are pregnant before the age of 25 years.
- This study has shown that women in urban areas are less likely to be stressed than women in non-urban areas.
- This study also shows the significance of anxiety in non graduates while no significance in anxiety levels in graduates.
- The urban area had no working women with the presence of anxiety and 38.10% non working women in urban areas presented with anxiety.

A Study used stress assessment scale to assess the stress, significant difference in the stress levels of working and non working pregnant women were recorded. 63% of working pregnant women complained of lacking strength, 50% of pregnant women complained of getting inadequate sleep or

disturbed sleep and 50% of them felt isolated and lonely during pregnancy^[32].

A Study reported that stress levels between working and non working women comparing different categories. It showed that

- Age of the pregnant women played a significant role in the association of stress levels between both working and non working women.
- Marital status in the association of stress levels did not play a significant role in working women but was of significance in non working women.
- The association between stress levels and type of family revealed significant association among working women but was not of any significance in non working women.
- Education of the women played a significant role in the stress levels of non working women but was of no significance in working women.
- Association of stress levels with family income revealed no significance in non working women but revealed significance in working women^[33].

DN Marshal-1995 study shows that anxiety disorders are usually common in women especially during childbearing. Worsening of symptoms occur during the third trimester leading to panic attacks, obsessive compulsive disorders and mood disorders.

Earlier studies have also showed that higher stress and psychological ailments during pregnancy leads to adverse pregnancy outcomes and bad mental health.

These results have been in line with earlier studies, such as a study based on workplace stress states that work has been major stressor in pregnancy. Concluding that pregnant women who continued to work have higher stress and psychological ailments.

Working women also had better education status compared to non-working women. Contradictory a study stated that education played a protective role against antenatal anxiety and depression. Less education of housewives were associated with higher levels of anxiety and depression when compared educated working women.

Identified subjects may then be referred for more formal assessment and evaluation. This scale showed working women to be having more stress than their non working counterparts.

Conclusion

Stress during pregnancy, though known to affect the physiological and psychological health of the mother, has received little attention.

Pregnant women frequently do not receive screening for stress and psychiatric morbidity^[34]. It is very important that mental health of pregnant women should be paid attention and to be screened and treated for stress, anxiety and depression. Relaxation techniques such as meditation and exercise are recommended to curb the effects of stress. Women suffering with pregnancy related stress should avoid harmful actions such as eating disorders, drinking and smoking to prevent the complication associated with stress. Data on mental health among working women in India is very minimum and no data is available especially with reference to pregnant working women. Using simple assessment scales enables community health workers to easily screen for stress during pregnancy.

Using the study findings, it would be a step in the right direction to urge clinicians and policy makers to screen all pregnant women for stress and psychiatric morbidity, in order to ensure better maternal and infant health. This study hopes to be a tool in that endeavor.

This study will aim to fill this data void, and enable health care professionals to develop a holistic plan to assess for and manage antenatal stress and psychiatric illness, to reduce both maternal and infant morbidity.

Summary

The Comparative study involved 150 pregnant women, 75 working and 75 non working in their third trimester who attended the antenatal clinic of Kempegowda Institute of Medical Sciences, Bangalore. The mean age with standard deviation was 25.12±2.96 for non working women and 26.84±3.09 for working women.. The A-Z Stress Rating Scale (86.71±26.41) and Brief PHQ (12.27±4.16) in working women showed higher scores compared to non working women which showed A-Z Stress Rating Scale (71.12±32.07) and Brief PHQ (10.09±5.52). They were also statistically significant<0.01. Both A-Z Stress Rating Scale and Brief PHQ showed significance difference in non urban areas but not in urban areas and the age above 25years showed significance but no significance below 25years. The urban area had no working women with the presence of anxiety and 38.10% non working women in urban areas presented with anxiety.

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