



Science

LEVEL OF STRESS AMONG PREGNANT WOMEN WITH HEART PROBLEMS

Hanan Elzeblawy Hassan ^{*1}, Eman Ali Abd El Moaty Sheha ², Elsayda Hamdy Nasr ³

^{*1} Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, EGYPT

² Community Health Nursing, Faculty of Nursing - Fayoum University, EGYPT

³ Maternity, Obstetric & Gynecological Nursing, Faculty of Nursing, Port said University, EGYPT

DOI: 10.5281/zenodo.58961

ABSTRACT

Although its prevalence is comparatively low in pregnant women, heart disease is the most significant cause of maternal mortality. About 2% of pregnancies involve maternal cardiovascular disease and this poses an increased risk to both mother and fetus. In-depth interviews for the convenience of 178 pregnant women with heart disease going through 400 pregnancies associated with medical disorders, which were booked in the high-risk obstetric departments and the antenatal outpatient clinics at all governmental hospitals in Beni-Surf City. The prevalence of heart disease of Pregnancy was 44.5%. The severity level of stress was found in the age group of 25-30 years, obese women, urban areas and women who were in their first trimester, Multigravida and who had a history still birth/birth defects. Statistically significant correlation was found between stress levels and age, education, occupation, income, obesity and residence. There is substantial evidence that heart disease with pregnancy is risk factors for adverse stress outcomes for mothers. More specifically, heart disease with pregnancy is associated with severe level of stress.

Keywords:

Heart disease, Pregnancy, stress.

Cite This Article: Hanan Elzeblawy Hassan, Eman Ali Abd El Moaty Sheha, and Elsayda Hamdy Nasr, “LEVEL OF STRESS AMONG PREGNANT WOMEN WITH HEART PROBLEMS” International Journal of Research – Granthaalayah, Vol. 4, No. 7 (2016): 220-230.

1. INTRODUCTION

Approximately 2% of pregnancies include maternal cardiovascular disease and this represents an expanded danger to both mother and fetus. Most ladies with cardiovascular disease can encounter pregnancy with appropriate support, however a careful prepregnancy assessment is required. Sometimes, heart illness may manifest for the first time during pregnancy, on the grounds that the hemodynamic changes may compromise a restricted cardiac reserve. Numerous

variables, at last, determine the counseling & guidance during pregnancy and the modality of delivery of individual patients with heart disease in a given group. A multidisciplinary team approach with obstetricians, anesthetists and cardiologists during pregnancy, delivery as well as the postpartum period is recommended. Jointly, these women receive a spectrum of structural heart disease, including rheumatic heart disease, coronary artery disease, pulmonary hypertension, cardiomyopathy and inherent heart disease. The heterogeneous nature of this group implies that the data we use to build our management protocols is incomplete. To have the capacity to practice to the standard requested by an “Evidence Based Medicine” approach it is basic that we set up a prospective registry. ^[1]

In ladies with heart disease, maternal mortality is accounted for to be much higher than normal and the danger gives off an impression of being expanding such that in western nations. Coronary illness is the significant reason for maternal death. However, we don't completely comprehend what the effect of pregnancy is on the progression of coronary illness or how heart disease influences the outcome of pregnancy. ^[2]

Cardiovascular sickness in pregnancy is turning out to be progressively obvious, as ladies with congenital heart disease (CHD) have longer life expectancies than previously. ^[3] The full spectrum of structural heart disease, including congenital heart disease (CHD), valvular heart disease (VHD), and cardiomyopathy (CMP), furthermore ischemic heart disease (IHD) might be experienced in pregnant ladies. In developing nations that still struggle with a high prevalence of rheumatic fever, acquired VHD dominates, whereas in developed countries, CHD is the main diagnostic group. Likewise, over the recent few years, the incidence of an acute coronary event during pregnancy has expanded, due to older childbearing age, and changes in way of life with more hypertension, smoking, and obesity in women. ^[2]

Ladies with innate heart disease represent the dominant part of those with heart disease who present for consideration during pregnancy. It is likely, along these lines, that later on expanding quantities of ladies with inherent heart disease will exhibit for maternity care. While the majority of ladies with coronary illness have fruitful pregnancies and cardiovascular complications during pregnancy are uncommon, there are a few conditions that pose significant challenges to midwives, obstetricians and cardiologists, especially when the pregnancy debilitates the life or health of the mother or baby. ^[4]

AMI (Acute myocardial infarction) during pregnancy is uncommon, happening in 1 in 35,000 pregnancies. Indicators of AMI during pregnancy include chronic hypertension, maternal age, diabetes, and preeclampsia. Most myocardial areas of localized necrosis (i.e. infarctions) happen during the third trimester in ladies more seasoned than 33 years who have had multiple prior pregnancies. Coronary fit, in situ coronary thrombosis, and coronary analyzation happens more oftentimes than exemplary obstructive atherosclerosis. Maternal mortality is most astounding in the antepartum and intrapartum periods. Recent studies have found a 5% to 7% case-fatality rate in ladies with pregnancy- related AMI, which may reflect enhancements in diagnosis and treatment over the previous decade. ^[5]

It is apparent that RHD remains an imperative and most basic reason of maternal mortality and morbidity in developing nations. While its occurrence has been diminishing in the developed

nations where the other acquired heart illnesses, for example, Acute MI, weight related DM and HTN as well as surgically corrected CHD being on the ascent.

More ladies with innate heart disease now achieve their grown-up reproductive years healthy. It is likely hence that the quantity of the individuals who present for consideration during pregnancy will keep on increasing. The physiological changes that ordinarily happen in pregnancy can trade off the states of ladies with heart illness, frequently abandoning them with negligible cardiovascular reserve. There are especially high dangers connected with certain cardiovascular conditions and pregnancy in these ladies is contraindicated. Ladies with innate heart illness can be physically sick during pregnancy and most have added emotional requirements. The necessities of these ladies are often complex and diverse with numerous potential complications. Midwives caring for these patients are consequently challenged to remain not only competent in midwifery, but also in many aspects of cardiology, together with the need to remain sensitive to the emotional care requirements that accompany these conditions.^[4]

It is essential that pregnant ladies with extreme heart disease are made mindful of the ramifications of pregnancy for themselves and the baby. Once an informed choice has been made and if the pregnancy is not terminated, then it is the role of the birthing attendant to offer maximum support to the lady in her choice and to give evidence-based midwifery practice. This will include collaborative care with the cardiologist, obstetrician, neonatologist and other members of the multidisciplinary team, depending on the individuals recognized necessities.^[4] Studies demonstrate that 31% of ladies will develop some sort of tension issue during their lifetime.^[6] Anxiety is a state of mind which creates depending on natural stimulants that are seen by the individuals as being unsafe or threatening and have unpleasing impacts.^[7] Evidence of high vulnerability to stress during pregnancy is more generally accessible, at least for certain subgroups of ladies. For instance, a late study of an assorted urban sample found that 78% experienced low and moderate antenatal psychosocial stress and 6% experienced abnormal levels.^[6]

Research on pregnancy concentrates generally on diagnosable psychological issue, fundamentally tension, and depressive issue and some degree on posttraumatic stress issue taking after unfriendly life events or labor encounters.^[8, 9, 10] Meanwhile, a parallel writing has grown rapidly in another wellbeing field, particularly behavioral medicine, wellbeing psychology, and social epidemiology, regarding stress in pregnancy and the implications for mothers, infants, and advancement over the life course.^[11]

Studies have recommended that ladies with tension identified with pregnancy might be at a more serious danger for postnatal depression. Consequently, acknowledgment and management of nervousness issue in pregnant ladies might be of enthusiasm for the avoidance of postnatal depression.^[12] Studies have additionally demonstrated that the moms of infants who exhibited poor neonatal adjustment reported higher levels of tension and depression at study section than did moms of healthy babies.^[13] High antenatal maternal tension was observed to be identified with consideration deficit hyperactivity issue manifestations, externalizing problems, and nervousness in 8-9 year olds.^[14] Hence, prompt diagnosis and treatment are urgent to prevent the maternal morbidity which thus will affect fetal, baby and child advancement.^[15]

2. AIM OF THE STUDY

This study aimed to assess and identify the psychosocial health profile and determine the prevalence of stress among pregnant women with chronic heart disease and shed light psychosocial support available for them.

3. RESEARCH QUESTION

- What is the prevalence of heart disease among pregnant women in Beni Suef?
- What is the relationship between heart disease among pregnant women and stress levels?

4. SUBJECTS AND METHODS

4.1.SUBJECTS

The study was conducted at governmental hospitals in Beni-Suef City, over a period of 6 months, from February to July 2015. Data was collected from 178 pregnant women with heart disease going through 400 pregnancies associated with medical disorders, which were booked in the high-risk obstetric departments, and the antenatal outpatient clinics at our hospital.

4.2.METHODS

Demographic, historical and obstetrical information about participants in the study were collected using an interviewer's questionnaire which were administered by the researcher to meet the aims of the study, based on the literature review. The questions covered their socio-demographic background (age, occupation, income, residence education degree). Baseline characteristics of the women, such as the parity, gestational age. The presence of stress symptoms known to be associated with gestational heart disease by using the Depression Anxiety Stress Scale (DASS-21).^[16] The DASS Depression focuses on reports of low mood, motivation, and self-esteem. A respondent indicates on a 4-point scale the extent to which each of 21 statements applied over the past week. Each point is scored from 0 (did not apply at all) to 3 (applied very much or most of the time). Higher scores on each subscale indicate greater levels of stress

5. STATISTICAL METHODS

Data collected were entered in Excel and the analysis was done using SPSS 16 statistical software for windows. The data were summarized in tables, charts and graphs. Continuous variables were reported using mean \pm S.D (Standard deviation) for the normally distributed variables. Categorical variables were reported using numbers and percentages. Univariate analysis was done using Chi- square test to find the association between outcome and the other study variables. Pie chart for the graphical presentation. All analysis was considered statistically significant at 5% level (p value <0.05).

6. RESULTS

Figure (1) illustrated that, during 6 months, 400 pregnant women associated with various types of medical disorder admitted in the antenatal high risk ward or visited the outpatient antenatal clinic of which 178 women were diagnosed with heart disease. The prevalence of heart disease of Pregnancy was 44.5%.

Table (1) provides various levels of stress associated with sociodemographic characteristics in the group of pregnant women. The distributions of stress severity with respect to age group, obesity and residence show that the highest percentage of severe level of stress was found in the age group of 25-30 years (53.6 %), obese women (68.0%), urban areas (95.0%) and least was less than 20 years' age group (6.6%), not obese (32.0%), rural (5.5%) ones. Statistically significant correlation was found between stress levels and age, education, occupation, income, obesity and residence ($p= 0.005, 0.002, 0.055, 0.000, 0.000$ and 0.000), respectively.

Baseline obstetrical characteristics of the women studied are as shown in **Table2**. The Subject characteristic of woman who were diagnosed as a medical disorder having a mean gestational age 12.06 ± 8.91 weeks at the time of data collection. The majority of the women belonged to severe level of stress was observed in women who were in their first trimester (67.4%), Multigravida (69.1%) and had a history still birth / birth defects (57.5%).

The distribution of the studied sample as regards associated between pregnancy associated with heart disease and stress symptom severity is presented in **Table (3)**. It demonstrates that 42.5% of the study sample had severe stress and 47.8% of them had mild to moderate level.

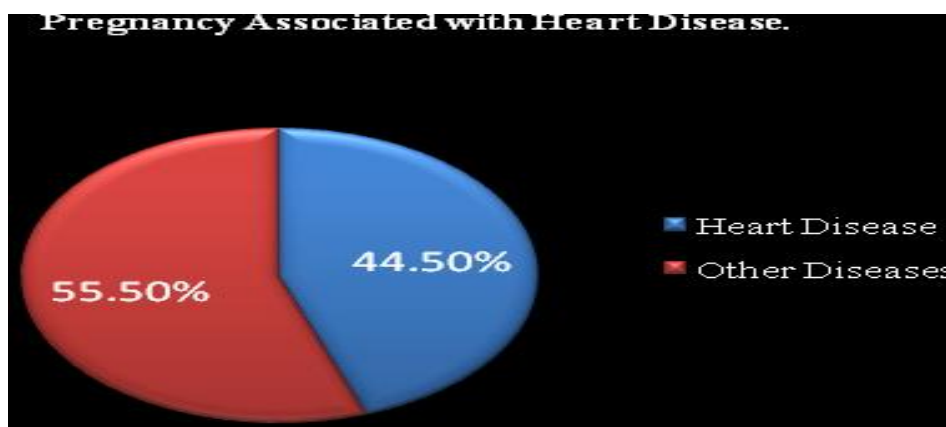


Figure 1: Pregnancy Associated with Heart Disease

Table 1: Patient demographic and associations with Stress severity

Variables	Stress			P-Value
	Absent	Mild to Moderate	Severe	
Age				
< 20-	22.4%	13.0%	6.6%	0.005
20-	32.8%	29.2%	33.1%	

25-	31.0%	50.3%	53.6%	
30-	13.8%	7.5%	6.7%	
Educational level				
Primary education (read/write)	0.0%	9.3%	11.0%	0.002
Secondary education or equal	100.0%	85.7%	78.0%	
University education	0.0%	5.0%	11.0%	
Occupational status				
Working	58.6%	60.2%	48.1%	0.055
Housewives	41.4%	39.8%	51.9%	
Family income adequacy				
Enough	0.0%	10.6%	20.4%	0.000
Not enough	100.0%	89.4%	79.6%	
Obesity				0.000
Present	75.9%	48.4%	68.0%	
Absent	24.1%	51.6%	32.0%	
Residence				
Urban	72.4%	93.2%	95.0%	0.000
Rural	27.6%	6.8%	5.0%	

Table 2: Patient obstetric characteristics and associations with Stress severity

Variables	Stress			P-Value
	Absent	Mild to Moderate	Severe	
Trimesters				
1st Trimester	100.0%	68.3%	67.4%	0.000
2nd Trimester	0.0%	19.9%	21.0%	
3rd Trimester	0.0%	11.8%	11.6%	
Total	100.0%	100.0%	100.0%	
Gravida				
Multigravida	75.9%	77.6%	69.1%	0.170
Primigravida	24.1%	22.4%	30.9%	
Parity				
Multiparous	51.7%	53.4%	51.9%	0.965
Nulliparous	48.3%	46.6%	48.1%	
History of abortion				
None	82.8%	66.5%	89.0%	0.011
Once or more	17.2%	33.5%	11.0%	

History of birth defects				
None	74.1%	73.9%	57.5%	0.002
Once or more	25.9%	26.1%	42.5%	

Table 3: Association between pregnancy with heart disease and stress symptom

Variables	Stress			
	Absent	Mild to Moderate	Severe	P-Value
History of heart diseases				
No	58.6%	52.2%	57.5%	0.515
Yes	41.4%	47.8%	42.5%	

7. DISCUSSION

The prevalence of CHD (Congenital Heart Disease) has been portrayed to be 8.2 per 1000 live births in European nations. ^[17] Pregnancy of ladies with heart disease is still a challenging condition since it is connected with raised fetal and maternal morbidity & mortality. In the clinical setting, an exact individual danger appraisal is of crucial significance. ^[1] Pregnancy in inherent heart patients is like ladies without heart illness; likewise, ladies with coronary illness have a desire to become pregnant. Initially, numerous ladies with cardiovascular malady were advised not to become pregnant, since it was thought to be a too huge hemodynamic burden. ^[18] Major hemodynamic changes take place during pregnancy. All peripheral vascular resistance (TPVR) is decreased and blood volume and cardiac output have expanded around 50%. During delivery and labor, cardiac output is further expanded as a consequence of uterine contractions and maternal effort. After delivery, most changes are quickly turned around in the initial 2 weeks with further standardization toward preconception values after 3-12 months. ^[19] Some of these ladies got to be pregnant regardless. Thus giving confirmation and experience that it was conceivable and a radical new field of cardiology emerged. ^[18]

Despite the fact that its prevalence is generally low in pregnant ladies, heart disease is the most essential reason of maternal mortality. Problems may emerge because of hemodynamic burden and the hypercoagulable condition of pregnancy. Heart disease might be innate or acquired. In developed nations, the former composes the greatest part out of ladies with coronary illness. Patients with unrepaired lesions, cyanotic lesions, diminished systemic ventricular function, complex inherent heart disease, left ventricular outflow tract obstruction, pulmonary hypertension, or mechanical valves are at highest risk of developing complications during pregnancy. ^[20]

Stress factors may influence uterine circulation, thus diminishing blood stream achieving the decidua, and thus influencing the implantation site. ^[15] Evidence for impacts of maternal stress and anxiety in pregnancy on adverse neurodevelopmental outcomes for the child is substantial, through a process known as ‘fetal programming’. Late research on symptoms of anxiety and depression during pregnancy is reviewed similarly within two subsections distinguishing findings on PTB from those on LBW. ^[8] More consistent effects have been found for ‘pregnancy

anxiety' (known as 'pregnancy-specific anxiety' & similar to 'pregnancy distresses').^[8] A large body of research is now available regarding affective states and stress during pregnancy as indicators of particular pregnancy conditions and birth outcomes.^[21]

Early identification and treatment of psychological issue in pregnancy can prevent morbidity in pregnancy and postpartum with the concomitant risks to baby and mother. Both psychotherapy and pharmacotherapy ought to be considered. In British Columbia, the Reproductive Mental Health program offers consultation, instruction administrations and education services to specialists and allied health professionals throughout the territory.^[22] This article presents the prevalence of a psychosocial issue (stress or tension) experienced in pregnant ladies with congenital heart disease, and the relationship between stress and women's personal and obstetrical characteristics.

The results of the present study revealed that, 44.5% of the study sample suffer from congenital heart disease. Regarding to the level of stress symptoms, among them, the present study displayed that 47.8% had mild to moderate level of symptoms, while 42.5% of them had severe level. This may be attributed to lack qualified professional staff and diagnostic procedures in some areas in Upper Egypt. Spencer M., et al (2006) expressed that, barriers to health include cultural inappropriateness of treatment; linguistic barriers; differential quality of interpersonal care or patient-provider communication; and access to and receipt of appropriate diagnostic, preventive, and therapeutic services and modalities.^[23] Although, this result is not consistent with the Ruys's research (2013) who stated that Since 1980, numerous aspects of diagnostic, surgical and medical treatment of coronary illness have enhanced, supposedly resulting in less physiological stress on the patient.^[20] It was in line with Kovacs AH. Et al (2005) who reported that, adults with inherent heart illness differ from the general population by medical status and medical history, and have particular psychosocial needs and problems.^[24]

According to obstetrical characteristics, the current study revealed that the first trimester of pregnancy is the greatest one associated with mild to moderate and severe level of stress 68.3% & 67.4%, respectively, while the third trimester is the least one 11.8% & 11.6%. In addition, 33.5% of women who experienced previous abortion had mild to moderate level of stress while 11.0% of them had severe level. These results are in line with Santvana S., et al (2005) who stated that Pregnancy either impels or exacerbates pre-existing stress and in turn, stress seems to have a negative effect on pregnancy, particularly in the first trimester which is additionally the time of the highest rate of miscarriage. That abortion occurred as a reaction to joy, wrath, grief, fear and, even, disagreeable odors, was widely believed by the medical profession in the 17th and 18th centuries.^[15] A vast collection of research is currently accessible regarding affective states and stress during pregnancy as predictors of particular pregnancy conditions and birth outcomes. Pregnancy either incites or worsens previous stress and thus, stress appears to negatively affect pregnancy, particularly in the first trimester which is additionally the time of the highest rate of miscarriage.^[21, 25] Statistically significant associations between gestational age ($p=0.000$) and history of abortion ($p=0.011$) and history of birth defects ($p=0.002$) and level of stress symptoms was observed.

The results of the current study illustrated that seriousness level of stress symptoms were convergent among housewives (51.9%) and working women (48.1%). Moreover, mild to

moderate level of stress symptoms were more prevalent among working women (60.2%) than housewives' ones (39.8%). In addition, the severity of symptoms was observed more prevalent among secondary technical education (78.0%) compared to university one (11.0%). This might be ascribed to pregnancy with coronary illness related distress can emerge from the often ignorance regarding self-care requests identified with. These results are in congruent with other researches.^[7,26] Additionally, van Rijen E., et al (2003) and van Rijen EH, et al (2005) noted that, it has been demonstrated that young adults with inborn coronary illness got a lower educational and occupational level compared to normative reference groups.^[27,28] Furthermore, as to subjective wellbeing status, patients experienced more constraints in physical functioning.^[28] Statistically significant associations between woman's occupational and educational status and severity level of stress symptoms, $p = (0.055 \text{ \& } 0.002)$, respectively, was found.

The results of the present study showed that the majority of the study sample hasn't adequate family income and urban residency. Stress symptoms were more prevalent among poor women (79.6%) than rich ones (20.4%). In addition, the results of the study showed that women who live in urban areas had severe level of stress symptoms (95.0%) than the rural ones (5.0%). This may due to that, the patients having a place with poor families were worried about themselves and about the treatment costs since they were unable to endure high costs of treatment of the threaded life medical issue and also urbanized zones include additional load and stressors. These results were affirmed by other studies.^[7, 15, 29] Ruys P. (2013) added; in spite of apparent enhancements in treatment, hardly any progressions were found in psychosocial outcome. The recent patients with inborn heart disease sample demonstrated a positive personal satisfaction, in spite of a few psychosocial impairments as to relationships, offspring, lower occupational level and lower pay. At the point when looking at psychosocial outcome of the recent innate heart disease sample with the historical congenital heart disease sample, no significant better outcome of the recent inherent heart disease sample was observed.^[20] Highly Statistically significant associations between woman's residency and income status and severity level of stress symptoms, $p = (0.000 \text{ \& } 0.000)$, respectively, was observed.

8. CONCLUSION

Based on the findings of the present study, we have attempted to highlight some of the common psychological disorders which are seen in pregnant women with heart disease, and various factors to be considered regarding the sociodemographic, personal and obstetrical characteristics. In summary, there is substantial evidence that heart disease with pregnancy is a risk factor for adverse stress outcomes for mothers. More specifically, heart disease with pregnancy is associated with severe level of stress.

9. RECOMMENDATION

In the light of the study findings, it is recommended to:

- 1) Clinical screening for stress in prenatal health care has been widely recommended.
- 2) Health providers raised practical difficulties, such as the need for harm reduction and the widespread lack of access to psychotherapy services. In some cases, stress may be linked to harmful behaviors, In terms of treatment preferences, women have indicated a strong preference for psychotherapy over pharmacological options.

- 3) Finally, as nurses are the key persons, in giving care for pregnant women with stress, hence have an important role to play in assessing patients to cope with the psychosocial reactions and helping them to avoid undue illness behavior characterized by high anxiety level, avoidance of activity and a dependence attitude.

10. REFERENCES

- [1] Taha N., Mahmoud K., Eisa M., Darder A. Structural heart disease in pregnancy in El-Minia localities. *Egyptian Society of Cardiology. The Egyptian Heart Journal*. 2013; 65: 99-109. <http://dx.doi.org/10.1016/j.ehj.2012.04.003>.
- [2] Roos-Hesselink J., Ruys T., Stein Jo., et al. Outcome of pregnancy in patients with structural or ischaemic heart disease: results of a registry of the European Society of Cardiology. *European Heart Journal*. 2012: 2-9. Doi:10.1093/eurheartj/ehs270
- [3] Swinburne C. Take Heart. *Nursing Standard*. 2004; 18(42): 18-19.
- [4] Managing Cardiac Disease in Pregnancy. *British Journal of Midwifery*. 2005;11: 1-3
- [5] Pushpalatha K. Cardiac Diseases in Pregnancy-A Review. *JIMSA*. 2010; 23(4): 269-274.
- [6] Woods S., Melville J., Guo Y, et al. Psychosocial stress during pregnancy. *AJOG*. 2010; 202:61.e1–61.e7.
- [7] Hassan H. Infertility profile, psychological ramifications and reproductive tract infection among infertile women, in northern Upper Egypt. *Journal of Nursing Education and Practice*. 2016; 6 (4): 92-108. <http://dx.doi.org/10.5430/jnep.v6n4p92>
- [8] Schetter C. and Tanner L. Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. *Curr Opin Psychiatry*. 2012; 25(2):141-148. DOI:10.1097/YCO.0b013e3283503680. www.co-psychiatry.com
- [9] Leight L., Fitelson M., Weston C., Wisner K. Childbirth and mental disorders. *Int Rev Psychiatr*. 2010; 22:453–471.
- [10] Ross L, McLean L. Anxiety disorders during pregnancy and the postpartum period: a systematic review. *J Clin Psychiatry*. 2006; 67:1285–1298.
- [11] Dunkel Schetter C. Psychological science on pregnancy: stress processes, biopsychosocial models, and emerging research issues. *Annu Rev Psychol*. 2010; 62:531–558.
- [12] Misri S., Oberlander TF., Fairbrother N. et al. Relation between prenatal maternal mood and anxiety and neonatal health. *Can J Psychiatry*. 2004;49:684-9.
- [13] van den Bergh BR., Marcoen A. High antenatal maternal anxiety is related to ADHD symptoms, externalising problems, and anxiety in 8 and 9 year olds. *Child Dev* 2004;75:1085-97.
- [14] Beck CT. Post-traumatic stress disorder due to child-birth: the aftermath. *Nurs Res* 2004;53:216-24.
- [15] Santvana S., Shamsah S., Firuza P.& Rajesh P. Psychiatric disorders associated with pregnancy. *The Journal of Obstetrics and Gynecology of India*. 2005; 55(3): 218-227.
- [16] Parkitny L. & McAuley J. The Depression Anxiety Stress Scale (DASS). *Journal of Physiotherapy*. 2010; 56 (3): 204. <http://www2.psy.unsw.edu.au/dass/over.htm>
- [17] van der Linde D, Konings EE, Slager MA, Witsenburg M, Helbing WA, Takkenberg JJ, et al. Birth prevalence of congenital heart disease worldwide: a systematic review and meta-analysis. *J Am Coll Cardiol*. 2011 Nov 15; 58(21): 2241-7.
- [18] McFaul PB, Doñnan JC, Lamki H, Boyle D. Pregnancy complicated by maternal heart disease. A review of 519 women. *Br J Obstet Gynaecol*. 1988 Sep; 95(9): 861-7.

- [19] Hunter S, Robson SC. *Adaptation of the maternal heart in pregnancy. Br Heart J* 1992; 68: 540-3.
- [20] Ruys P. *Adult Congenital Heart Disease with Focus on Pregnancy. ISBN: 978-94-6169-403-4. Erasmus university; 2013: 11, 55-113.*
- [21] Beydoun H, Saftlas A. *Physical and mental health outcomes of prenatal maternal stress in human and animal studies: a review of recent evidence. Paediatr Perinat Epidemiol.* 2008; 290:595–596.
- [22] Carter D., Kostaras X. *Psychiatric disorders in pregnancy. BC Medical Journal.* 2005; 47 (2):96-99.
- [23] Spencer M., Kieffer E., Sinco B. *Diabetes-Specific Emotional Distress among African Americans and Hispanics with Type 2 Diabetes. Journal of Health Care for the Poor and Underserved.* 2006; 17: 88-105.
- [24] Kovacs AH, Sears SF, Saidi AS. *Biopsychosocial experiences of adults with congenital heart disease: review of the literature. Am Heart J* 2005; 150: 193-201.
- [25] Hassan H. *Call for psychosocial well-being among pregnant women associated with medical disorder in Beni-Suef governorate. IOSR Journal of Nursing and Health Science.* 2016; 5(2), Ver. 4: 81-94. DOI: 10.9790/1959-0502048194.
- [26] Thekdi K, Mehta P, Thekdi P, Kartha G. *Fertility Profile, Anxiety, Depression of Married Women and Its Association with Reproductive Tract Infections in the Rural Area of Surendranagar District. Scholars Journal of Applied Medical Sciences (SJAMS),* 2014; 2 (1A): 104-108.
- [27] van Rijen EH, Utens EM, Roos-Hesselink JW, et al. *Psychosocial functioning of the adult with congenital heart disease: a 20-33 years follow-up. Eur Heart J* 2003; 24: 673-83.
- [28] van Rijen EH, Utens EM, Roos-Hesselink JW, et al. *Current subjective state of health, and longitudinal psychological well-being over a period of 10 years, in a cohort of adults with congenital cardiac disease. Cardiol Young* 2005; 15: 168-75.
- [29] Hassan H. Mohamed A. and Ibrahim M. *Depression Symptoms among Diabetic Pregnant Women in Beni-Suef. International Journal of Science and Research (IJSR).* 2016; 5 (5): 7-12. DOI: <http://dx.doi.org/10.21275/v5i5.NOV163080>.