

PREVALENCE OF DEPRESSION, ANXIETY AND STRESS AMONG POST-NATAL MOTHERS HAVING LOW BIRTH WEIGHT (LBW) INFANTS

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ABSTRACT

Introduction: Every pregnant mother wants their baby to be born in normal and healthy condition. Therefore, it would become a stressful event that might cause psychological distress or even emotional crisis in mother, when their infants are premature and low birth weight born.

Methodology: A cross-sectional study to investigate the psychological well being of mothers with low birth weight infants admitted to the SCN. It was conducted on one hundred and thirty (n=130) of mothers who delivered their babies at labor room, HRPZ II, Kota Bharu, Kelantan. Depression Anxiety Stress Scale (DASS-21) score were used. Data were analyzed using the Chi-square tests. Statistically significant with p -value < 0.05 .

Results: There was statistically significantly association between maternal age and anxiety ($\chi^2=22.106, p=0.036$) and maternal age and stress ($\chi^2=17.509, p=0.041$) by using chi square test. There was no significant association between maternal age and depression ($\chi^2=10.37, p=0.321$). The results showed that there was no statistical significance between maternal education, maternal occupation and family income with depression, anxiety and stress of mothers ($p>0.05$).

Conclusion: Based on the finding in this study, most of the respondents have anxiety compared to depression and stress. Therefore, a nurse must have knowledge and skills, especially in terms of psychology, in handling cases related to the mother who have given birth to a low birth weight (LBW) child because of parting with their children due to the relatively long hospitalization.

Keywords: Low birth weight infants, Depression, Anxiety, Stress mothers, DASS-21 score

INTRODUCTION

Every pregnant mother wants their baby to be born in normal and healthy conditions. Therefore, it would become a stressful event when their infants are premature and have low birth weight, and that might cause psychological distress or even emotional crisis in mothers. Low birth weight (LBW) is a major factor contributing towards high infant mortality in developing countries. Weight is a major health indicator because low weight infants are much more vulnerable to death or suffering disabilities (CDC, 2011). In Asian countries, the prevalence of postpartum depression ranges from 3.5% to 63.3% where Malaysia has the lowest and Pakistan has the highest (Klainin & Arthur, 2009).

Mothers of infants born preterm or LBW are at risk of experiencing psychological distress and depression following the child's birth, and although these

symptoms tend to decrease over time, some mothers remain depressed (Miles *et al.*, 2007). Therefore, it would become a stressful event when their infants are premature and low birth weight that require hospitalization especially in the Neonatal Intensive Care Unit (NICU) or Special Care Nursery (SCN), and that might cause psychological distress or even emotional crisis in mothers. Individuals differ in their overall levels of psychological health and well-being. These individual differences are important because well-being is associated with positive life and health outcomes (Davis *et al.*, 2003). It is supported by Murray and Lopez (1996). World Health Organization (WHO) predicts that depression will be the second greatest cause of premature death and disability worldwide by the year 2020. The suffering caused by depression is profound yet often underestimated. It can affect every aspect of a person's being: his feelings, thoughts and functioning.

OBJECTIVE

General objective:

To determine the prevalence of depression, anxiety and stress among post natal mothers having Low Birth Weight (LBW) infants.

Specific objectives:

1. To determine the prevalence of postnatal depression, anxiety and stress among mothers having LBW infants.
2. To identify the relationship between socio demographic characteristics (maternal age, education level, family income and occupation) of mothers with low birth weight infant and depression.
3. To identify the relationship between socio demographic characteristics (maternal age, education level, family income and occupation) of mothers with low birth weight infant and anxiety.
4. To identify the relationship between socio demographic characteristics (maternal age, education level, family income and occupation) of mothers with low birth weight infant and stress.

LITERATURE REVIEW

Postnatal depression is particularly important because it is so common and because it occurs at such a critical time in the lives of the mother, her baby and her family. Post Partum Depression (PPD) is defined as a non-psychotic depressive illness of moderate severity that can last for several weeks, months or even a year after childbirth if left untreated (Chan *et al.*, 2002). Recent report indicated that 10%-15% of women suffer from postpartum depression (PPD), whereas approximately 10% develop an anxiety disorder after delivery (Halbreich, 2005).

Risk factors for postpartum mood disorders include several socio demographic and obstetric parameters. The study shows that there are numerous problems that affect the mothers' emotions, their infants and families (Leiferman, 2002). Beck (2001) found that various maternal socio-demographic factors contributed to the onset of depression in the postpartum period, such as lower socioeconomic status. This study indicates the importance of measuring and analyzing a mother's

socioeconomic status (SES) because it may be related to the mother's depressive symptoms.

Regarding infant-related factors, preterm delivery infant's health problem was associated with PPD (Tamaki, Murata, & Okano, 1997). In the study of Miles *et al.* (1999), the findings indicated that mothers of medically fragile infants experience both distress and growth as the result of their child's illness. Worries about their babies and their child-care abilities are particularly stressful to new mothers as they are the primary caregivers.

METHODOLOGY

This study is a cross-sectional study design, carried out at SCN at Hospital Raja Perempuan Zainab 11, Kota Bharu, Kelantan. A simple random sampling was used to select mothers with LBW baby who were admitted in the SCN, and those who fulfill the inclusion criteria were selected. The sample size was 130 based on the prevalence of LBW admitted in SCN were 8.8 % (Boo & Chor, 1994). The Dependent variable was depression, anxiety and stress of mothers with LBW infants and the independent variables were socio demographic characteristics of mothers.

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 19.0 for Windows. Descriptive data analysis, including frequency, mode, mean and standard deviation and Chi-Square test was used to estimate the probable association between the variables concerned like age, education, occupation, and family income of mothers with psychological well-being. Statistically significant data was considered to be those having a *p*-value less than 0.05.

Inclusion criteria:

All mothers with LBW infant who are admitted in the SCN; mothers being able to read and understand *Bahasa Melayu* and English language and mothers with no previous experience in SCN.

Exclusion criteria:

Mothers with BBA (Birth Before Arrive); mothers with normal baby; mothers with big baby (weighs above 4000 grams) and mothers who did not volunteer to participate.

Data collection procedures:

The researcher divided the questionnaire into 3 different parts: Part A: factors socio demographic of mother, Part B: factors socio demographic of infant and Part C: Depression Anxiety Stress Scales (DASS) 21 adapted from Lovibond & Lovibond (1995). The Depression Anxiety Stress Scales (DASS) 21 is a self-report instrument designed to measure the negative emotional state of depression, anxiety and stress was used. DASS-21 is a self-report questionnaire to assess anxiety, depression, and feelings of stress in adults. It contains 21 items covering the past week, rated on a four-point scale, ranging from 'not at all' (=0), to 'very much, or most of the time' (=3). By summing item scores, three syndrome scores of each seven items can be derived: Depression, Anxiety and Stress.

Validity and reliability:

The bahasamelayu DASS-21 item has been validated by Ramli *et al.*, (2007). The content validity index of the DASS-21 questionnaire was 0.904 (CI 95%) thus proved its validity. Cronbach's alpha coefficient produces a reliability coefficient that ranges between 0.00 and 1.00

Division of Depression, Anxiety & Stress

Rating	Depression #1	Anxiety #2	Stress #3
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	37+

Study Ethics:

Before carrying out this research project, an approval letter was sent to the Hospital Raja Perempuan Zainab 11, Kota Bharu, Kelantan to get the consent. The researcher gave a clear explanation regarding the aim and procedure of study to the respondents. The researcher also told the respondents that their answers were confidential and will only be used for the purpose of academic research.

RESULTS

Socio demographic characteristics of the mothers:

A total of 130 respondents participated in this study giving a response rate of 100%. The majority of the respondents involved in this study were Malay (n=129, 99.2%) and Chinese (n=1, 0.8%). The age of the

respondents ranged from 16-45 years old and the Mean (SD) was 29.03 6.48. The majority of respondents belonged to the age group of 20-29 years was 62 (47.70%). The majority of the respondents (n= 108, 83.1%) had attained secondary education (PMR, SPM, STPM), 18 (13.8%) had attained tertiary or above (Diploma/Degree/Master) qualifications while the remaining 3.1% or 4 subjects had completed primary education and below Ujian Penilaian Sekolah Rendah (UPSR).

DASS 21 Scoring:

The 21-item form of the DASS was incorporated into the questionnaire to measure severity of symptoms common to anxiety and depression and the prevalence of co-morbid depression and anxiety. Women were asked to use a 4-point severity or frequency scale to rate the extent to which they had experienced each symptom over the past week from 'never' to 'most of the time'. Each item consists of four alternative statements graded in severity and scored from 0 to 3.

1) For questions numbered 3, 5, 10, 13, 16, 17, 21 add up the numbers circled then multiply that number by 2 and enter it here: **Depression**

2) For questions numbered 2, 4, 7, 9, 15, 19, 20 add up the numbers circled then multiply that number by 2 and enter it here: **Anxiety**

3) For questions numbered 1, 6, 8, 11, 12, 14, 18 add up the numbers circled then multiply that number by 2 and enter it here: **Stress**

Most of the respondents were house wife, (n= 91, 70%), working as professional 27(20.8%) and only 12(9.2%) were working as non professional. The occupation status of fathers was categorized into two groups: professional and non professional. Majority of fathers' occupations were from the non professional that made up 100(76.9%)

compared to professional group 30(23.1%). A family income was divided into four categories. Most of the respondents have family income <RM1000 about 66(50.8%), between RM1000-RM1999 were 34(26.2%), between RM2000-2999 were 14(10.8%) and above RM3000 were 16 (12.3%). The Mean (SD) of number of dependents was 4.151.34. Most of the respondents having the number of dependents between 3-5 were 113 (86.9%), while 15 (11.5%) respondents were on number of dependents 6-8, and 2 (1.5 %) were 9-11 numbers of dependents.

Birth characteristic of the infants:

Most of the respondents which is 90(69.2%) delivered their infants by spontaneous vaginal delivery while 40 respondents (30.8%) delivered by caesarean section. By using the WHO classification of infant's birth weight, the low birth weight was divided into three categories. The LBW infants seen in the period were distributed as follows: LBW was 93(71.5%), VLBW was 29(22.3%) and ELBW was 8(6.2%). The majority of infant were born pre-term 76(58.5%), full-term infants were 49 (37.7%) and post date infants were 5(3.8%). The overall Mean (SD) low birth weight was 1849.38 ± 523.32 grams, with minimum weight 800 grams and maximum weight 2480 grams.

Prevalence of depression, anxiety and stress by using DASS 21 scales

Prevalence of depression

The prevalence of psychological well-being of mothers was identified by DASS 21 item score. Score of this scale ranged from 0-37+. The researcher found that the psychological well-being of mothers by using DASS-21 scales show that for those mothers having depression in 'mild' rating was 18(13.8%), 'moderate' was 20(15.4%) and 'severe' was 4(3.1%) for depression.

For the depression score, the highest mean score was item 13 with the mean (SD) was 0.91(0.709), for the statement "*I felt down-hearted and blue*". For this item score 1 (applied to me to some degree, or some of the time) was 70(53.8%), score 2 (applied to me to a considerable degree, or a good part of time) was 21(16.2%) and score 3 (applied to me very much, or most of the time) was 2(1.5%). The lowest mean was item 21 with the Mean (SD) was 0.14(0.462), which asked for responses to the statement "*I*

felt that life was meaningless". The score 0 (Did not apply to me at all) was 116(89.2%), score 1 was 12(9.2%) and score 2 was 2(1.5%). The overall mean ± SD for depression score was 7.72 ± 5.61.

Prevalence of anxiety:

The prevalence of mothers reporting symptoms for anxiety in the 'mild' range on the DASS-21 scales was 11(8.5%), 'moderate' was 39(30.0%), 'severe' was 14(10.8%) and extremely severe was 12(9.2%). For the anxiety score, the highest mean score was item 2 with the mean (SD) was 1.32(0.737), which asked for responses to the statement "*I was aware of dryness of my mouth*". For this item score 1 (applied to me to some degree, or some of the time) was 65(50.0%), score 2 (applied to me to a considerable degree, or a good part of time) was 44(33.8%) and score 3 (applied to me very much, or most of the time) was 6(4.6%). The lowest mean was item 4 with the Mean (SD) was 0.36(0.610), which asked for responses to the statement "*I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)*". The score 0 (Did not apply to me at all) was 91(70.0%), score 1 was 32(24.6%), score 2 was 6(4.6%) and score 3 was 1(0.8%). The overall Mean ± SD for anxiety score was 9.64 ± 6.25.

Prevalence of stress:

Meanwhile prevalence for stress of mothers reporting symptoms in the 'mild' range on the DASS-21 scales was 29(22.3%), 'moderate' was 15(11.5%) and 'severe' was 6(4.6%) for stress. For the stress score, the highest mean score was item 18 with the mean (SD) was 1.44(0.807), which asked for responses to the statement "*I felt that I was rather touchy*". For this item score 1 (applied to me to some degree, or some of the time) was 51(39.2%), score 2 (applied to me to a considerable degree, or a good part of time) was 53(40.8%) and score 3 (applied to me very much, or most of the time) was 10(7.7%). The lowest mean was item 6 with the Mean (SD) was 0.37(0.572), which asked for responses to the statement "*I tended to over-react to situations*". The score 0 (Did not apply to me at all) was 88(67.7%), score 1 was 36(27.7%) and score 2 was 6(4.6%). The overall the mean ± SD for stress score was 12.80 ± 6.98.

Table 1: Prevalence of depression, anxiety and stress by using DASS 21 scales (n=130)

Rating	Depression n (%)	Anxiety n (%)	Stress n (%)
Normal	88(67.7)	54(41.5)	80(61.5)
Mild	18(13.8)	11(8.5)	29(22.3)
Moderate	20(15.4)	39(30.0)	15(11.5)
Severe	4(3.1)	14(10.8)	6(4.6)
Extremely severe	-	12(9.2)	-

Relationship between socio demographic factors and psychological well being of mothers (Depression) n=130

Table 2 show that the relationship between socio demographic factors and psychological well-being of mothers (depression) by using DASS 21 scales. The Chi-Square was used, statistically significant with p -value < 0.05. The distribution of depression according to age of the mothers showed that there was no significant association between maternal age and

depression ($\chi^2 = 10.37$, $df=9$, $p=0.321$). In other word maternal age do not affect the depression. There was no significant association between maternal education and depression ($\chi^2=9.27$, $df=6$, $p=0.159$). To explore the impact of maternal occupation with depression, the result found that there was no significant association between maternal occupation and depression ($\chi^2=2.37$, $df=6$, $p=0.883$). There was no significant association between income level groups and depression ($\chi^2=5.36$, $df=9$, $p=0.802$).

Table 2: Relationship between socio demographic factors and psychological well being of mothers (Depression) n=130

Variable	Depressio					χ^2 (df)	p-value
	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	Extremely severe n(%)		
Maternal age (years)						10.37 (9)	0.321
<19	5 (55.6)	3 (33.3)	1 (11.1)	-	-		
20-29	38 (61.3)	11 (17.7)	11 (17.7)	2 (3.2)	-		
30-39	39 (79.6)	3 (6.1)	5 (10.2)	2 (4.1)	-		
>40	6 (60.0)	1 (10.0)	3 (30.0)	-	-		
Maternal education						9.27 (6)	0.159
Primary	2 (50.0)	1 (25.0)	-	1 (25.0)	-		
Secondary	72 (66.7)	16 (14.8)	17 (15.7)	3 (2.8)	-		
Tertiary	14 (77.8)	1 (5.5)	3 (16.7)	-	-		

Occupation (Mother)						2.37 (6)	0.883
Housewives	61 (67.0)	13 (14.3)	13 (14.3)	4 (4.4)	-		
Professional	18 (66.7)	4 (14.8)	5 (18.5)	-	-		
Non Professional	9 (75.0)	1 (8.3)	2 (16.7)	-	-		
Estimation of family income						5.36 (9)	0.802
<RM1000	43 (65.2)	10 (15.2)	10 (15.2)	3 (4.5)	-		
RM1000-RM1999	22 (64.7)	4 (11.8)	7 (20.6)	1 (2.9)	-		
RM 2000-RM2999	9 (64.3)	3 (21.4)	2 (14.3)	-	-		
>RM3000	14 (87.4)	1 (6.3)	1 (6.3)	-	-		

*Significant $P < 0.05$

Relationship between socio demographic factors and psychological well being of mothers (Anxiety) n=130

Table 3 shows the relationship between socio demographic factors and psychological well-being (anxiety) of mothers by using DASS 21 scales. The distribution of anxiety of mothers according to age of the mothers showed that there was a statistically significant association between maternal age and anxiety ($\chi^2=22.10, df=12, p=0.036$). The result found that there was no association between maternal educations and anxiety ($\chi^2=8.36, df=8, p= 0.398$). There was no significant association between occupations of mothers and anxiety ($\chi^2=9.16, df=8, p= 0.329$). Results found that

there was no statistically significant difference between four income level groups with anxiety ($\chi^2=12.12, df=12, p=0.436$).

Relationship between socio demographic factors and psychological well being of mothers (Anxiety) n=130

Table 3 shows the relationship between socio demographic factors and psychological well-being (anxiety) of mothers by using DASS 21 scales. The distribution of anxiety of mothers according to age of the mothers showed that there was a statistically significant association between maternal age and anxiety ($\chi^2=22.10, df=12, p=0.036$). The result found

Table 3: Relationship between socio demographic factors and psychological well being of mothers (Anxiety) n=130

Variable	Anxiety χ^2					χ^2 (df)	p- value
	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	Extremely severe n(%)		
Maternal age (years)						22.10 (12)	0.036*
<19	1 (11.1)	2 (22.2)	6 (66.7)	-	-		
20-29	27 (43.5)	4 (6.5)	13 (21.0)	11 (17.7)	7 (11.3)		

30-39	24 (49.0)	3 (6.1)	15 (30.6)	3 (6.1)	4 (8.2)		
>40	2 (20.0)	2 (20.0)	5 (50.0)	-	1 (10)		
Maternal education						8.36 (8)	0.398
Primary	1 (25.0)	1 (25.0)	1 (25.0)	-	1 (25.0)		
Secondary	42 (38.9)	10 (9.3)	33 (30.6)	12 (11.1)	11 (10.2)		
Tertiary	11 (61.1)	-	5 (27.8)	2 (11.1)	-		
Occupation (Mother)						9.16 (8)	0.329
Housewives	32 (35.2)	11 (12.1)	29 (31.9)	10 (11.0)	9 (9.9)		
Professional	14 (51.9)	-	8 (29.6)	3 (11.1)	2 (7.4)		
Non Professional	8 (66.7)	-	2 (16.7)	1 (8.3)	1 (8.3)		
Estimation of family income						12.12 (12)	0.436
<RM1000	23 (34.8)	7 (10.6)	21 (31.8)	7 (10.6)	8 (12.1)		
RM1000-RM1999	14 (41.2)	3 (8.8)	10 (29.4)	6 (17.6)	1 (2.9)		
RM 2000- RM2999	6 (42.9)	1 (7.1)	5 (35.7)	-	2 (14.3)		
>RM3000	11 (68.8)	-	3 (18.8)	1 (6.3)	1 (6.3)		

*Significant $P < 0.05$

Relationship between socio demographic factors and psychological well being of mothers (Stress) n=130

Table 4 shows the relationship between socio demographic factors and psychological well-being of mothers (stress) by using DASS 21 scales. The distribution of stress of mothers according to age of the mothers showed that there was a statistically significant

association between maternal age and stress ($\chi^2=17.50$, $df=9$, $p=0.041$). There was no significant association between maternal educations and stress ($\chi^2=7.18$, $df=6$, $p=0.304$). Results found that there was no significant association between occupations of mothers and stress ($\chi^2=6.76$, $df=6$, $p=0.343$). The results found that there was no significant association between four income level groups and stress ($\chi^2=8.84$, $df=9$, $p=0.452$).

Table 4: Relationship between socio demographic factors and psychological well being of mothers (Stress)n=130

Variable	Stress					χ^2 (df)	p- value
	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	Extremely severe n(%)		
Maternal age (years)						17.50 (9)	0.041*
<19	4 (44.4)	1 (11.1)	2 (22.2)	2 (22.2)	-		
20-29	33 (53.2)	18 (29.0)	8 (12.9)	3 (4.8)	-		
30-39	37 (75.5)	6 (12.2)	5 (10.2)	1 (2.0)	-		
>40	6 (60.0)	4 (40.0)	-	-	-		
Maternal education						7.18 (6)	0.304
Primary	2 (50.0)	-	1 (25.0)	1 (25.0)	-		
Secondary	65 (60.2)	27 (25.0)	12 (11.1)	4 (3.7)	-		
Tertiary	13 (72.2)	2 (11.1)	2 (11.1)	1 (5.6)	-		
Occupation (Mother)						6.76 (6)	0.343
Housewives	51 (56.0)	24 (26.4)	10 (11.0)	6 (6.6)	-		
Professional	20 (74.1)	4 (14.8)	3 (11.1)	-	-		
Non Professional	9 (75.0)	1 (8.3)	2 (16.7)	-	-		
Estimation of family income						8.84 (9)	0.452
<Rm1000	39 (59.1)	14 (21.2)	9 (13.6)	4 (6.1)	-		
RM1000-RM1999	19 (55.9)	10 (29.4)	3 (8.8)	2 (5.9)	-		
RM 2000- RM2999	8 (57.1)	3 (21.4)	3 (21.4)	-	-		
>Rm3000	14 (87.5)	2 (12.5)	-	-	-		

*Significant $P < 0.05$

DISCUSSION

Based on the findings in this study, most of the respondents have anxiety compared with depression and

stress. This study evaluated the indicators for depression anxiety and stress in mothers of infants born with low birth weight (<2,500 grams) during hospitalization of the baby

in the SCN. Several studies indicated that compared to the parents of healthy infants, parents of preterm or low weight infants experience higher levels of anxiety and depression (Darlow & Mulder, 2001). Having an infant born preterm was dominated by feelings of anxiety. Feeling closeness to the child was important, and separation from the child was a very stressful experience. The high scores were found for state-anxiety in mothers of preterm infants, which caused difficulties in confronting the situation of the infant's prematurity (Pinelli, 2000). In addition a higher number of parents of NICU infants had clinically relevant anxiety and depression when assessed within 3 weeks of infant admission, compared to a control group of parents of full term infants (Carter *et al.*, 2005). In the month following the birth of their infant, mothers of NICU infants, when compared with control mothers, scored higher on measures of the following: difficulty making decisions, depression, anxiety, and obsessive-compulsive behaviors (Singer *et al.*, 1999).

Relationship between maternal age and depression, anxiety and stress of mothers

Most studies have documented a tendency of increasing birth weight with maternal age. Maternal age and health are significant predictors of birth outcomes (Delbaere *et al.*, 2007). Another studying it was found that the rate of low birth weight babies among teen mothers was 35 percent higher than that among mothers aged twenty to twenty-nine (9.6 percent as against 7.1 percent) (Joyce *et al.*, 2002). The rate among the youngest teens, those fifteen and younger was 14.1 percent, higher than in any age group except forty-five to fifty-four. Adolescent mothers < 20 years of age had 1.5 times more risk of delivering LBW baby (Bisai *et al.*, 2006). The result research finding show that mother's age increased significantly ($p < 0.005$) with the decrease in LBW.

In this study found that by using DASS 21 scales, shows no significant association between maternal age and depression ($\chi^2 = 10.37$, $p = 0.321$). However, there was statistically significantly association between maternal age and anxiety ($\chi^2 = 22.10$, $p = 0.036$) and stress ($\chi^2 = 17.50$, $p = 0.041$). These finding results was similar with study who reported that mothers, aged 30 years or less, had in general more depression than the mothers aged 31 years or more (Hiltunen, 2003). However, maternal age did not affect the persistence of depressive symptoms. Age has claimed to associate with postnatal depression; both older and younger women are at increased risk (Kumar & Robson, 1984). On the other

hand, in various studies mother's social class, education, race, age or parity has not been associated with postnatal depressive symptoms (Cooper, Campbell, & Day, 1988; Murray *et al.*, 1995)

Relationship between maternal education and depression, anxiety and stress of mothers

Low birth weight is associated with a number of key developmental, educational and socio-economic outcomes in later life (Kuh & Ben-Scloma, 2004). Maternal education, itself, is possibly a result of both genetic and environmental conditions. Most of the respondents have secondary education (PMR/ SPM/ STPM) considered equal to 108 (83.1%). This study found there was no significant association between education of mothers and depression of mothers ($\chi^2 = 9.27$, $p = 0.159$), anxiety ($\chi^2 = 8.36$, $p = 0.398$) and stress ($\chi^2 = 7.18$, $p = 0.304$).

Similar finding by previous study found that there was no correlation between maternal depression and a low socioeconomic status and level of maternal education in a preterm population (Booten *et al.*, 1988). However, contrast finding reported that mother's having higher education has been reported to be a protective factor and lower age was a risk factor for depression (Bernazzani *et al.*, 1997).

The socio-cultural variables like maternal education, hard manual labor, and place of residence have significant effects on birth weight (Mondol, 2000). There was a strong association between mother's educational status and birth weight, and a trend of increasing birth weight with higher education, where the correlation coefficient of income and mothers' education was found to be positive (Som *et al.*, 2004). The mother's educational status is an important predictor of a LBW infant.

Several studies suggest that paternal education also plays a role in LBW. As maternal educational level increases, the risk of a LBW infant decreases, making maternal education a protective factor for LBW (Isaranurug, Mo-suwan, & Choprapawon, 2007; Hillemeier *et al.*, 2007; Mortensen *et al.*, 2008; Li & Sung, 2008). This might be due to the fact that educated mothers are well informed about antenatal care and other precautions to be taken during the child bearing period, which obviously favorably affect the weight of the newborn babies. Education may also have independent effects, above and beyond income, because more highly educated mothers may know more about family

(Mortensen, 2008; Li & Sung, 2008).

Relationship between family income and depression, anxiety and stress of mothers

Social and economic factors are even harder to pin down. The results of the previous study show that mothers living in poverty are at a higher risk of getting LBW and/or premature babies than their high socio-economic mother. Most of the researchers are not certain why low socioeconomic status increases the risk for LBW. The experience of delivering a low birth weight infant and the possibility of infant death place mothers at increased risk for psychological distress during the neonatal period (Singer *et al.*, 1996).

In this study, there was no significant association between the family income and depression ($\chi^2=5.36$, $p=0.802$), anxiety ($\chi^2=12.12$, $p=0.436$) and stress ($\chi^2=8.84$, $p=0.452$). However, other study found that mothers from lower SES families reported stronger beliefs in their ability to parent their infants than did mothers from higher SES families (Schiffman, Omar & McKelvey, 2003).

The infant admitted in hospital especially the infant is premature, the normal parental process and the mental preparation of parenthood are interrupted (Bracht *et al.*, 1998). Socio-economic deprivation has an effect on both these pathways; being independently associated with both premature delivery and with babies who are not born early but who are born under developed (Kramer *et al.*, 2000). A preliminary systematic review of the effect on income inequality and macro-level social policy on infant mortality and low birth weight in developed countries was recently published (Spencer, 2004). Previous studies showed that lower social class is associated with an increased risk of various adverse pregnancy outcomes including prenatal mortality, premature birth and LBW (Memon, Sheikh & Memon, 2005).

Low socio-economic status is the underlying cause of low birth weight. However, another study found no relationship between maternal depression and low socioeconomic status and the level of maternal education led to the birth of preterm birth (Davis *et al.*, 2003).

Low birth weight can be prevented by improving socio-economic status and health status among pregnancy mothers. The socio-economic status indicator measures the level of poverty and wealth of a person. Socioeconomic status is typically measured according to occupational status but can also be measured by means

of income or educational attainment. Infants with LBW will be susceptible to death and then bring grief to the families (Hack & Fanaroff, 2000). A high incidence of LBW babies reflects poor maternal reproductive health, poor nutritional status of women, improper practices during pregnancy, and low socioeconomic status of pregnant women.

Relationship between mother's occupations and depression, anxiety and stress of mothers

Women of low socio economic status are at increased risk for delivering low birth weight babies, irrespective of their income, occupation or education. The results of this study show that there was no statistically significant difference between mother's occupations with depression ($\chi^2=2.37$, $p=0.883$), anxiety ($\chi^2=9.16$, $p=0.329$) and stress ($\chi^2=6.76$, $p=0.343$). The low professional occupations with lower life satisfaction connected to other factors (e.g. infant's low birth weight and disappointment with delivery) were associated with risk of depression (Bergant *et al.*, 1999). The occupation played a significant role in birth weight in which babies born from the "grower" family have the lowest birth weight (2670 grams) compared to family of service holders have infants of the highest birth weight (2844 gram) (Som *et al.*, 2004).

CONCLUSION

Considering the findings of this study, the implementation of psychological intervention programs is recommended for the purpose of promoting meeting between mothers, in a protected setting, so that mothers feel free to express their feelings. Improving women's health before, during, and after pregnancy is the key to reduce the human and economic costs associated with infant mortality and morbidity. Mothers' situations could be facilitated if nurses had increased knowledge and understanding about how mothers experience this situation. In summary, in this study researcher found that there was a statistically significant association between maternal age with anxiety and stress. Nurses must have critical thinking such as determining what psychosocial variables affect maternal health behaviors; intervention programs must be designed to promote healthy behavior.

The implementation of the program of psychological intervention in the neonatal unit aims at encouraging mothers to express feeling and expenses incurred by them. With this method the nurse can identify the level of psychological stress that mothers are experiencing and refer them to a counselor as emotional support. The

most important thing is to implement preventative measures such as conducting a health promotion that aims to provide early awareness to mothers about baby health care from the early stage of pregnancy as a precautionary measure to reduce morbidity and mortality rates among LBW infants. Therefore, the finding of this study can create awareness regarding early detection of PPD among postnatal women and reduce the negative impact that affects women.

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