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## Assessment of peripartum psychological disturbances in relation to modes of delivery

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### Abstract

**Background:** Anxiety disorders are common during peripartum period. This study aimed to identify which mode of delivery was more prone to develop psychological disturbances. **Methods:** This prospective cohort study conducted among 541 pregnant women presented for spontaneous labour, induction or elective caesarean section in a Malaysian hospital. The severity of depression, anxiety and stress symptoms are assessed by using self-rated depression anxiety and stress scales in four different occasions; pre-labour/operation, 24 hours postnatal, 2 weeks, and at 6 weeks. **Results:** In the prenatal period, there was no statistically significant difference in the mean score of depression between women coming for labour ( $4.17 \pm 5.28$ ) and elective CS ( $4.21 \pm 5.87$ ). During puerperium; at 24 hours postnatal, 2 weeks and 6 weeks assessments there was no significant difference in depression score among patients with different modes of delivery. The overall scores were ( $4.23 \pm 5.46$ ,  $3.26 \pm 4.85$ ,  $0.78 \pm 2.37$ ,  $0.18 \pm 0.93$ ) for patients going through vaginal delivery, instrumentation, emergency or elective CS. The same trend was found when anxiety and stress were analysed. **Conclusions:** The most prominent peripartum psychological disturbances symptom is anxiety. Minority of patients will experience persistence anxiety by the end of 6 weeks postpartum. The caesarean section and induction of labour does not increase the psychological impact.

*Keywords: anxiety, caesarean section, depression, induction of labour, stress*

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### Introduction

Mood and anxiety disorders are common in women during their child bearing years.<sup>1</sup> During pregnancy, these physical and emotional changes occur mainly during peripartum period. Some women experience sadness, anxiety, depression, stress and other disturbing emotions mainly after giving birth.<sup>2</sup> Mood disorders include depression, anxiety and stress.

Depression is a mood disorder that is characterized by diminished interest in pleasure activities in addition to other symptoms within duration of at least two weeks.<sup>3</sup> Major depression is twice more common in women as in men and frequently clusters during the childbearing years. Anxiety is characterized by intense feeling of dread accompanied by somatic symptoms that indicate a hyperactive autonomic nervous system. Anxiety impairs cognition and may produce distortions of perception.<sup>4</sup> Stress is defined by physiological and psychological responses to events that are perceived as threatening or challenging, and which require a behavioural response.<sup>5</sup>

Mood disorders cause distress and adversely affect daily functioning and personal relationships. If left untreated they can have long-term adverse effects on the baby. The prevalence of depression has been reported to be between 10% and 16% during pregnancy.<sup>6</sup> Those women need help through liaison psychiatry or consultative psychiatry interface between medicine and psychiatry, usually taking place in a hospital or medical setting. Liaison psychiatry usually provides a service to patients in a general medical hospital, either inpatients or outpatients. The postnatal period is a critical time for the woman and it is associated with high incidence of anxiety, stress and depression including postnatal blues, which is mild, self-limiting episodes of psychological disturbances beginning 2–7 days after childbirth. Postpartum depression may also develop because of the stressful period in nursing neonate. The prevalence rate of postpartum depression in urban Malaysian mothers was comparable to the rates in other countries. Screening for depression should become a routine during postpartum period.<sup>7</sup>

Significant number of women will not go through spontaneous vaginal delivery (SVD) as pregnancy might end by induction of labour or caesarean section (CS). The modes of delivery have different impact on maternal emotions and psychology<sup>8</sup> that reflected on the birth experience and affecting the future pregnancies. Research has shown that women who inquired a CS on maternal request had lower social support, were less educated, more anxious, and had a lower sensitivity for physical pain compared to women seeking for spontaneous delivery.<sup>9</sup>

Induction of labour is a common practice in obstetrics and has a wide spectrum of indications. Its rate reaches 20% of the deliveries.<sup>10</sup> The situation is the same with caesarean section's rate, it increases in the recent years and according to the latest data from 150 countries, currently 18.6% of all births occur by CS, ranging from 6% to 27.2% in the least and most developed regions, respectively.<sup>11</sup> Instrumentation during the 2nd stage of labour—as an obstetrical emergency procedure—is a recognised stressful situation to the mother.<sup>12</sup> Few researchers evaluate medical and surgical interventions impacts on maternal psychology in the peripartum period.<sup>13</sup>

The benefits of health improvement and financial saving obtained from liaison psychology services overweigh the costs of running them.<sup>5,14</sup> Early detection and intervention of psychological disturbances pre and post-delivery will ameliorate the possible morbidity, cost of treatment and burden caused by these disturbances leading to a better quality of life and cost effective management.

This study traced those changes in the prenatal, intrapartum and postpartum period for 6 weeks. We compared the severity of anxiety, depression and stress symptoms in women going for spontaneous labour, induction or caesarean section.

## Methods

This is a prospective cohort study conducted on a sample of 541 pregnant women presented for labour at the Hospital Tengku Ampuan Afzan, Pahang state, Malaysia. Random sampling was conducted between June 2016 to May 2017 and Institutional approvals obtained from International Islamic University Malaysia (IIUM) Research Ethical Approval Committee (IREC), Director of Hospital Tengku Ampuan Afzan and National Medical Research Register (NMRR). Informed consent was obtained from the participants after the nature of the procedure was fully explained. The participants were free to ask questions regarding the questionnaires that are used. The participation was entirely on a voluntary basis. All participants were ensured of the confidentiality and that information gathered were only used for research purposes.

Inclusion criteria include pregnant women who were able to give informed consent, able to communicate in Bahasa Malaysia, patients admitted in early labour or for induction regardless the final mode of delivery such as vaginal (normal or instrumental), and patients admitted for elective caesarean section (CS). Exclusion criteria were premature labour spontaneous or iatrogenic. Patients will be divided into four groups; successful normal vaginal delivery, instrumental delivery, emergency and elective CS.

Socio-demographic characteristics data was collected from the patients. The prevalence and severity of depressive, anxiety and stress symptoms assessed by using the self-rating Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS-21) which had been translated and validated and it had very good Cronbach's alpha values of 0.84, 0.74 and 0.79 for depression, anxiety and stress respectively, it also had good psychometric properties so that it is suitable to be used for clinical subjects in Malaysia.<sup>6,15</sup> DASS-21 is a short version, self-rated questionnaire. Each item is scored on a 4-point scale.<sup>16</sup> Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. Each subscale is categorized into normal, mild, moderate, severe and extremely severe. In this study, we have classified further those who have severe and extremely severe symptoms as clinically significant' and those with mild and moderate as 'subclinical'.

Each woman in the 4 groups assessed in four different occasions; at the time of labour/operation then a second assessment done 24 hour after delivery, 2 week and 6 weeks from delivery to observe the occurrence and progress of emotional disturbances.

**Statistical Analysis.** The collected data keyed manually into a database and cleaned before analysis. The statistical package for social sciences (SPSS) software 22v was used for both descriptive and inferential analysis. Items that are not answered by respondents were considered as missing. Univariate statistics such as mean values, standard deviations, frequencies and proportion percentages derived for continuous and categorical variables respectively. Bivariate and multivariate analyses are used to measure the strength of association between the variables in the study and identify predictors for the outcomes of interest respectively. All tests were two-tailed with significance defined as  $p < 0.05$ .

## Results

The mean age group and parity were similar among women delivered by NVD, Emergency and elective CS while patient delivered with instrumentation shows lower mean age group and low parity. Out of 540

screened respondents, about 54% were undergone NVD, 7% Instrumentation, 23% emergency C.S. and 15% were elective C.S. The studied population reflects different levels of education with majority of secondary school level with economic status of income below 5000RM (Table 1).

Table 2 is showing wide range of responses in our studied population. There is no difference in anxiety or depression or stress in women with different modes of delivery. Increasing anxiety is the most significant finding among women in labour with prenatal mean score of 7.34 (normal scoring = 0–7). Stress was more obvious among deliveries ended by instrumentation; however, the difference did not reach a level of significance. By the end of the second week postpartum,

the stress scores were similar to those that went through other modes of deliveries. The time effect is obvious in all psychological emotions in the postnatal period as noted decline in the adverse emotions when studied at the second and sixth week's assessment.

Significant number of pregnant women showing depressive symptoms during perinatal period, the symptoms improved gradually with time. Most patients will go back to normal by the end of the puerperium (Table 3). Prenatally, anxiety is more prominent than depression. Most of anxieties resolve by the end of the puerperium, however, some subclinical anxiety might persist (Table 3). The same trend was noted in the pattern of stress (Table 3).

**Table 1.** Demographic related to mode of delivery: Data displayed as mean and range given in closed bracket

	NVD (n = 292)	Instrumentation (n = 38)	Emergency C.S (n = 126)	Elective C.S (n = 84)
	mean (range)	mean (range)	mean (range)	mean (range)
<b>Age/year</b>	29.52 (15–44)	27.61 (18–39)	30.29 (16–42)	30.05 (18–50)
<b>Parity</b>	2.52 (0–11)	1.42 (0–4)	2.05 (0–7)	2.37 (0–12)
<b>Gestational age/weeks</b>	38.51 (26–48)	38.58 (29–40)	38.07 (28–41)	38.44 (32–41)
<b>Education</b>				
Primary (n = 37)	(n = 16)	(n = 3)	(n = 14)	(n = 4)
Secondary (n = 313)	(n = 169)	(n = 22)	(n = 76)	(n = 45)
Higher (n = 191)	(n = 107)	(n = 13)	(n = 36)	(n = 35)
<b>Income</b>				
<5000 RM (n = 457)	(n = 246)	(n = 33)	(n = 109)	(n = 68)
>5000 RM (n = 80)	(n = 44)	(n = 5)	(n = 17)	(n = 14)

Primary = Grade 1–6; Secondary = Form 1–5; Higher = University and Diploma

**Table 2.** Depression, anxiety and stress scores of the respondents in relation to mode of delivery. Data represented as mean  $\pm$  SD

Mean score	NVD	Instrumentation	Emergency CS	Elective CS	Overall	p
<b>Depression</b>						
prenatal	4.17 $\pm$ 5.28	4.26 $\pm$ 5.82	4.33 $\pm$ 5.56	4.21 $\pm$ 5.87	4.23 $\pm$ 5.46	0.23
24 hours	3.33 $\pm$ 4.97	3.68 $\pm$ 5.76	2.80 $\pm$ 4.11	3.57 $\pm$ 5.04	3.26 $\pm$ 4.85	0.31
2 weeks	0.74 $\pm$ 2.35	1.26 $\pm$ 3.23	0.57 $\pm$ 1.81	1.04 $\pm$ 2.73	0.78 $\pm$ 2.37	0.41
6 weeks	0.22 $\pm$ 1.05	0.05 $\pm$ 0.32	0.11 $\pm$ 0.52	0.21 $\pm$ 1.12	0.18 $\pm$ 0.93	0.29
<b>Anxiety</b>						
prenatal	7.43 $\pm$ 6.50	7.63 $\pm$ 6.97	7.12 $\pm$ 6.42	7.25 $\pm$ 6.58	7.34 $\pm$ 6.51	0.57
24 hours	6.36 $\pm$ 6.38	6.73 $\pm$ 7.63	5.60 $\pm$ 5.88	6.52 $\pm$ 6.30	6.22 $\pm$ 6.34	0.71
2 weeks	2.05 $\pm$ 3.55	2.10 $\pm$ 3.94	1.90 $\pm$ 2.98	2.59 $\pm$ 3.67	2.10 $\pm$ 3.47	0.17
6 weeks	0.45 $\pm$ 1.63	0.31 $\pm$ 0.87	0.32 $\pm$ 1.17	0.35 $\pm$ 1.35	0.40 $\pm$ 1.45	0.12
<b>Stress</b>						
prenatal	8.22 $\pm$ 6.92	9.42 $\pm$ 8.96	8.84 $\pm$ 7.08	7.88 $\pm$ 7.91	8.39 $\pm$ 7.26	0.21
24 hours	6.63 $\pm$ 6.56	7.36 $\pm$ 8.75	6.27 $\pm$ 5.95	6.95 $\pm$ 7.31	6.64 $\pm$ 6.71	0.18
2 weeks	2.26 $\pm$ 3.51	2.52 $\pm$ 4.54	1.90 $\pm$ 2.92	2.61 $\pm$ 3.86	2.25 $\pm$ 3.52	0.41
6 weeks	0.73 $\pm$ 1.98	0.57 $\pm$ 1.22	0.54 $\pm$ 1.67	0.45 $\pm$ 1.56	0.63 $\pm$ 1.80	0.36

**Note:** \*NVD: Normal Vaginal Delivery; Emergency CS: Emergency Caesarean Section; Elective CS: Elective Caesarean Section.

**Table 3.** Total rate and severity of depressive, anxiety, and stress symptoms among participants (n = 541)

Variables	Prenatal Number (%)	24 hours Number (%)	2 weeks Number (%)	6 weeks Number (%)
<b>Depressive Symptoms</b>				
Normal (not affected)	450 (83.18)	472 (87.25)	527 (97.59)	541 (100)
Subclinical	86 (15.90)	64 (11.83)	13 (2.41)	0 (0)
Clinically significant	5 (0.92)	5 (0.92)	0 (0)	0 (0)
Overall affected subjects	91 (16.82)	69 (12.75)	13 (2.41)	0 (0)
<b>Anxiety Symptoms</b>				
Normal (not affected)	305 (56.48)	351 (64.88)	488 (90.20)	537 (99.26)
Subclinical	173 (32.04)	137 (25.32)	51 (9.43)	4 (0.74)
Clinically significant	62 (11.48)	53 (9.80)	2 (0.37)	0 (0)
Overall affected subjects	235 (43.52)	190 (35.12)	53 (9.80)	4 (0.74)
<b>Stress Symptoms</b>				
Normal (not affected)	454 (83.92)	482 (89.09)	537 (99.44)	540 (100)
Subclinical	68 (12.57)	47 (8.69)	3 (0.56)	0 (0)
Clinically significant	19 (3.51)	12 (2.22)	0 (0)	0 (0)
Overall affected subjects	87 (16.08)	59 (10.91)	3 (0.56)	0 (0)

## Discussion

From our study, the mode of delivery carries no impact on maternal psychology. Women showed same levels of mood disorders regardless of the mode of delivery and they showed same trend postpartum. These findings agree with other studies<sup>17</sup> but contradict with other reseaeches that stated CS may associate with postnatal depression.<sup>8,18</sup> so the association of CS with the risk of postpartum depression remains controversial.

Our study shows that peripartum mood disorders are common as assessed by using DASS-21. Depression, stress and anxiety were expressed by significant number of mothers during peripartum period.

Depression symptoms were found in 16.82% of women at term. Another study using different questionnaire found the prevalence of minor depression among pregnant women to be 16.6%.<sup>19</sup> From our results, no significant depression symptoms seen at 6 weeks postnatal while others reported wide range of prevalences depending on the culture and tools used for assesment.<sup>20-22</sup> Detailed review on litruture regarding postnatal depression reported prevelences between 0.1–52.0%.<sup>23</sup> Rates varies depending on the diagnostic criteria, timing of screening and screening instruments used. We used DASS 21 for perinatal assesment while other studies using Edinburgh Postnatal Depression Scale (EPDS) which has its own limitations when applied Antenatally.<sup>24,25</sup> Furthur comparative studies are needed to determine which questionnaire is most sensative to pick up clinically significant depression during the perinatal period. Screening tool is to be standerised for pregnant women. Anxiety was the most promenant symptom experianced by our studied population, it was the only

symptom that persisted in some patients, about 10% of women experianced significant anxiety at 2 weeks postnatal, this anxiety persist until 6 weeks. Similar observation was noted by other researhers.<sup>19</sup> Effective measures should be introduced to antenatal programs to elivate anxiety as it is associated with future chilhood morbidity.<sup>26</sup> Measures could be in the form of antenatal education that is proved to be beneficial in reducing anxiety and depression among mothers.<sup>27</sup>

Stress is an imprtant factor during perinatal peroid that can affect future health of growing fetus through epigenic ultration.<sup>28</sup> It is expressed by 16.08% of our studied population antenatally but dramatically drops to 10% at one day postpartum and getting back to normal at 6 weeks gestation. From our results; women undergoes instrumental delivery recorded higher scor for stress compared to other modes of delivery, however, this difference did not reach the statistical significance level. The least scor for stress was reported by patients with elective cesarean section. This may reflect the psychological reassurance in women underging a clear plan for delivery as the case with elective surgeries.<sup>29</sup> This findings contradict with other studies using DASS-21 that nominate CS as a risk factor for prolong mood disturbances.<sup>12</sup>

In our study, the time effect was obvious in alivating peripartum mood disturbance symptoms. Most women showed improvement in the peripartum mood disorder with time. They will be free from adverse emotions by the end of purperium. Previous studies showed the same observation.<sup>23</sup> Screening and supportive counselling is needed mainly during antenatal and within two weeks postnatal in veiw of our finding. Most of the adverse mood changes will resolve by the end of perperium.

Limitation of the study, antenatal assessment of maternal emotions was done near labour event. The evaluation would be more consolidated if the study include earlier evaluation. Mothers at term are usually under the stress of near labour. There is general difficulty in evaluating subjective variables like assesment of emotions. However, the validated questionnaire may partially solve the problem but there is other overlooked confounders not included in our study. Another limitation in this study is 3rd and 4th interview were done through the cell phone, a face to face interveiw may bring different scoring for emotions.

## Conclusions

Depression, stress and anxiety symptoms are common during peripartum period. Anxiety is the most common symptoms and can last longer than other adverse psychological disturbances. Adverse symptoms resolve by the end of puerperium. The mode of delivery on women peripartum less likely to increase in psychological impact compared to the normal vaginal delivery.

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## Conflict of Interest Statement

There were no coflicts of interest.

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