

Associated Factors of Prenatal Depression among Teenage Pregnant Women at King Chulalongkorn Memorial Hospital

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Objective: Depression during pregnancy is associated with deteriorating maternal health and increasing risk of preterm birth, fetal growth restriction, and suicidal attempt. The problems may be worse in adolescents who are more vulnerable. This study was conducted to determine the percentage of depression among teenage mothers and its associated factors.

Material and Method: Two hundred teenage pregnant women aged between 13 and 19 years who visited King Chulalongkorn Memorial Hospital (KCMH) participated in the present study. They were asked to complete the validated Thai Edinburgh Postnatal Depression Scale (EPDS) questionnaire for depression screening. The cut-off score of 11 was used for the diagnosis of prenatal depression.

Results: Ninety-two (46%) teenage pregnant women were found to have prenatal depression using the EPDS cut-off score of 11. The mean age of participants was 17.5 years with the mean gestational ages of 23 weeks. Most of the participants (67%) resigned from school and 16% had history of attempted abortion during current pregnancy. There was no significant association between prenatal depression and unplanned pregnancy, unemployment, leaving school, or trimester at screening. Logistic regression analyses showed that history of attempted abortion and inadequate income were significantly associated with prenatal depression (odds ratio = 8.03, 95% CI 1.59 to 40.37 and 4.16, 95% CI 1.35 to 12.83, respectively).

Conclusion: Prenatal depression was common among teenage pregnant women who visited KCMH. Attempted abortion and inadequate income were found to be significantly associated with prenatal depression.

Keywords: Teenage pregnancy, Prenatal depression, Factor

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World Health Organization (WHO) has defined adolescence as the period in human growth and development that occurs after childhood but before adulthood, from ages 10 to 19 years. Teenage or adolescent pregnancy seems to be increasing in many developing countries particularly Thailand. Whereas the pregnancy rate in the US adolescents is declining during the last decade⁽¹⁾, the pregnancy rate among women aged 15-19 years in Thailand has increased from 31.1 per 1,000 women in the year 2000 to 53.8 per 1,000 women in 2012⁽²⁾.

Pregnant teenagers are associated with higher rate of cesarean section and various pregnancy complications such as preterm labor, low birth weight,

and puerperal infection. Because majority of the cases were unplanned pregnancies (77%)⁽³⁾, most adolescents decided to terminate pregnancy which might be unsafe. In addition, many studies found that teenage pregnant women would suffer more from psychiatric problems especially depressive symptoms⁽⁴⁻⁶⁾.

Depression during pregnancy is associated with deteriorating maternal health and increasing risk of preterm birth, fetal growth restriction, and suicidal attempt⁽⁷⁻⁹⁾. Children of pregnant women with prenatal depression were found to have certain risks of delayed development, psychiatric and medical problems when growing up⁽¹⁰⁻¹²⁾. With the higher rate of depression in teenage pregnant mothers, the subsequent risks among the children are certainly higher⁽⁴⁾. Moreover, previous studies revealed that those who suffered antepartum depression had a higher risk for postpartum depression⁽¹³⁾. Hence, it is more prudent to find a preventive measure or to detect depression at the earliest stage of pregnancy. A proper

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detection would certainly benefit the young pregnant women of their own health and their yet-to-be-born offspring in order to minimize any possible adverse events of pregnancy complications.

Though the problem of prenatal depression of teenage pregnancy is obvious to the public and medical professionals, there are scarce data and publications on the issue. This brought to our attention to systematically investigate into the magnitude of the problem i.e. the percentage of teenage pregnant women who had prenatal depression and its related factors. This basic but critical information may lead to innovative health strategy in trying to prevent and minimize any adverse outcomes in mothers and children in the future.

Edinburgh Postnatal Depression Scale (EPDS) developed by Cox et al⁽¹⁴⁾ was used as depression screening tool. The EPDS was originally used during postpartum period. After which it has been used worldwide for depression screening during prenatal and postpartum. The depression screening tool was found to have high specificity and high sensitivity and user-friendly. With the 10-item self-assessment questionnaire, it takes approximately five minutes to complete the items. The American College of Obstetricians and Gynecologists (ACOG) suggested that EPDS fits best in screening prenatal depression. In 2003, EPDS was translated to Thai and validated by Pitanupong et al⁽¹⁵⁾.

Material and Method

The present study was approved by the Institutional Review Board, Faculty of Medicine, Chulalongkorn University and conducted at King Chulalongkorn Memorial Hospital (KCMH), Bangkok, Thailand between June 2013 and April 2014. Two hundred participants were enrolled, pregnant women age between 13 and 19 years who attended the prenatal clinic at any gestational age. Women who were illiterate or had a psychiatric disorder were excluded.

After giving the consent, each participant was invited to sit in a comfortable room without any other persons to interfere or invade her privacy. They were asked to complete the questionnaire to collect demographic, socioeconomic and family information as well as the Thai version EPDS. The confidentiality and anonymity of the documents were assured to all participants.

The Thai version EPDS was used as the depression screening tool in the present study and obtained permission to use in the studied population.

It is a 10-items self-assessment questionnaire with four possible responses. To identify perinatal depression, the cut-off score at 11 was preferred with a sensitivity of 88.9% and a specificity of 91.2%⁽¹⁵⁾. Pregnant women with the EPDS score ≥ 11 or the score of the last question ≥ 3 were considered to have a risk for depression⁽¹⁶⁾ and would be sent for further evaluation by the psychiatrist.

Sample size was calculated by using formula of one sample estimating population proportion. With alpha error of 0.05 and a proportion from the pilot study (35% = percentage of prenatal depression in teenage pregnant women from our pilot study), the total number of sample was found to be 200 when an acceptable error was 7% and 10% added for lost to follow-up cases. SPSS version 17 was used for the data analysis. Mean, range, and percentage were used to describe the data. Chi-square or Fisher's exact test was used to determine an association between prenatal depression and each factor. Factors with p -value < 0.1 from the univariate analysis were further evaluated with Logistic regression analysis to determine statistical association with prenatal depression. Logistic regression analysis was used to calculate the adjusted odds ratios (OR) and 95% confidence interval (CI). The significant differences were $p < 0.05$.

Results

Two hundred pregnant women were recruited into the study. Mean age (\pm SD) of the participants was 17.5 (± 1.4) years and mean gestational age (\pm SD) at screening was 23.4 (± 8.8) weeks with a range from 5 week to 38 weeks of gestation. Half of participants were in second trimester (53%). Most of them were unmarried (81%), were school leavers (67%), and had no personal income (61%). Majority (71.5%) of them revealed that the current pregnancy were unplanned and 32 (16%) of them had attempted abortion but not succeeded. All demographic data in young mothers was shown in Table 1. Regarding prevalence of prenatal depression, the present study found that 92 subjects (46%) had depression according to the cut-off EPDS score ≥ 11 . Two from two hundred participants had suicidal idea (the last questionnaire score was ≥ 3).

Table 2 showed the percentage of personal and socioeconomic factors among depression and non-depression teenage mothers. There was no significant association between depression in women and the following factors, unplanned pregnancy,

having prenatal visits more than two times, abnormal symptoms during pregnancy, unemployment, leaving school, and trimester at screening.

From Table 2, the proportion of pregnant teenagers who having attempted abortion before prenatal care was shown to be significantly higher in the depressive women than in the non-depression group

(14.1% vs. 1.9%, $p = 0.002$). The depression group also had a history of regular alcoholic consumption significant higher than non-depression group (33.7% vs. 21.3%, $p = 0.049$). Lastly, inadequate income was the other factor that showed statistically significant difference between the depression (19.6%) and non-depression groups (5.6%) ($p = 0.002$).

Information regarding the participants' husbands and parents were collected. Two participants could not give accurate detailed information of their husbands. Mean age of the husbands was 21.7 years, ranged from 15 to 51 years. Out of this husband group, 44.9% aged less than 20 years. There were no statistically significant differences on occupation ($p = 0.276$) and educational status ($p = 0.658$) of husbands between the depressed and non-depressed teenage women.

The mean age of participants' fathers and mothers was 46.7 years (range 35-65 years) and 43.7 years (range 32-63 years), respectively. The non-depression group had significantly higher history of adolescent pregnancy in their mothers than in the depressed group (33.6% vs. 20.2%, $p = 0.04$) (Table 3). Parental acceptance of the pregnancy, both from father and mother, were significantly higher in the non-depression group. Whereas acceptance of the pregnancy from husband did not associated with depression, support from husband was significantly higher in the non-depression group ($p = 0.03$).

The factors that found the p -value from univariate analysis less than 0.1 were included in a multivariable logistic regression analysis to calculate

Table 1. Demographic characteristics in 200 teenage pregnant women

Characteristics	Mean \pm SD
Mean age (years)	17.5 \pm 1.4
Mean gestational age at screening (weeks)	23.4 \pm 8.8
	n (%)
Unmarried	162 (81.0)
Unplanned pregnancy	143 (71.5)
Being student	66 (33.0)
Timing at screening	
First trimester	36 (18.0)
Second trimester	107 (53.5)
Third trimester	57 (28.5)
Education level	
Grade 1-6	15 (7.5)
Grade 7-9	82 (41.0)
Grade 9-12	86 (43.0)
Bachelor degree	17 (8.5)
Personal income (Baht per month)	
None	122 (61.0)
Less than 6,000	22 (11.0)
6,001-15,000	47 (23.5)
More than 15,000	9 (4.5)

Table 2. Personal and socioeconomic factors in teenage pregnant women

Factors	Depression (n = 92) n (%)	Non-depression (n = 108) n (%)	p -value
Unplanned pregnancy	70 (76.1)	73 (67.6)	0.19
History of attempted abortion	13 (14.1)	2 (1.9)	<0.01
Prenatal care more than 2 times	33 (35.8)	53 (49.1)	0.06
Abnormal symptoms during pregnancy	75 (81.5)	84 (77.8)	0.51
History of alcohol use	31 (33.7)	23 (21.3)	0.05
Unemployment	56 (60.9)	67 (62.0)	0.87
Inadequate income*	18 (19.6)	6 (5.6)	<0.01
Leaving school	60 (65.2)	74 (68.5)	0.62
Timing at screening			0.58
First trimester	18 (19.6)	18 (16.7)	
Second trimester	51 (55.4)	56 (51.9)	
Third trimester	23 (25.0)	34 (31.5)	

* Inadequate income was defined as when the participants were in debt or could not cope with daily basic living expenses

Table 3. Family factors in teenage pregnant women

Factors	Depression (n = 92) n (%)	Non-depression (n = 108) n (%)	p-value
History of teenage pregnancy in mother	19 (20.2)	36 (33.6)	0.04
Living with			
Parents	45 (48.9)	58 (53.7)	0.49
Husband	67 (72.8)	78 (72.2)	0.92
Acceptance of the pregnancy			
Father	75 (81.5)	99 (91.7)	0.03
Mother	85 (92.4)	106 (98.1)	0.05
Husband	88 (95.7)	105 (97.2)	0.55
Support from husband	33 (35.9)	53 (49.1)	0.06

Table 4. Adjusted odds ratios of the factors associated with prenatal depression in teenage pregnant women

Associated factors ($p < 0.1$)*	Adjusted odds ratio	95% CI	p-value
History of attempted abortion	8.03	1.59-40.37	0.01
Prenatal care more than 2 times	0.57	0.30-1.08	0.08
History of alcohol use	1.70	0.83-3.49	0.15
Inadequate income	4.16	1.35-12.83	0.01
History of adolescent pregnancy in mother	0.51	0.25-1.05	0.07
Acceptance from father	0.62	0.22-1.71	0.36
Acceptance from mother	0.22	0.02-2.27	0.20
Support from husband	0.72	0.38-1.36	0.32

* The factors with $p < 0.1$ in Table 2 and 3 were further analysed using logistic regression analysis

adjusted odds ratios and their confidence intervals. These comprised of history of attempted abortion, prenatal care more than two times, history of alcohol use, inadequate income, having mothers with history of teenage pregnancy acceptance of pregnancy from father, acceptance of pregnancy from mother, and support from husband. After performed logistic regression analyses, there were only two factors significantly associated with prenatal depression ($p < 0.05$) (Table 4). These included history of attempted abortion (OR 8.03, 95% CI 1.59 to 40.37, $p = 0.01$) and inadequate income (OR 4.16, 95% CI 1.35 to 12.83, $p = 0.01$).

Discussion

The present study revealed an unexpectedly high prenatal depression rate of 46% among teenage pregnant women. Previous literatures reported different rates of depression in teenage pregnancy from 25.9 to 44.1%^(4,18,19). The high percentage of prenatal depression in this study may reflect the increase of teenage pregnancy in the country particularly during the past decades^(1,2). As one of the tertiary medical centers in

the country, KCMH tends to have higher rate of high-risk pregnancy when compared to general population.

The result of the present study was quite similar to the study of Nirattharadorn et al⁽²⁰⁾, although the screening tools used were different. We used EPDS, which has been used worldwide to screening depression in prenatal and postpartum women and is considered by some to be superior to the Center for Epidemiologic Studies-Depression Scale (CES-D). The advantages of the EPDS are its easy to use and to help shortening time to complete the self-assessment questionnaire⁽²¹⁾. Moreover, the American College of Obstetricians and Gynecologists (ACOG) suggested that EPDS fits best in screening prenatal depression. EPDS was shown to have high sensitivity, high specificity⁽¹⁵⁾ and was well validated in Thai pregnant women [area under ROC curve = 0.84 (95% CI, 0.76-0.91)]⁽¹⁶⁾, which we regard as the strength of this study. CES-D in Thai version had been validated only in non-pregnant adolescent aged between 15 and 18 years and has never been validated in Thai pregnant women.

The dramatic and acute changes of hormones from late pregnancy to postpartum have certain influence over HPO axis⁽²²⁾. The hormonal changes have been found to be associated with postpartum depression. Several studies compared the occurrence of depression between prenatal and postnatal periods⁽²³⁾. Nevertheless, there has never been report of the association between prenatal depression and different trimester as in this study. Our study found no association of prenatal depression with trimester at depression screening.

Fifteen pregnant teenagers were found to have attempted pregnancy termination but failed and continued the pregnancy. We found that there were a higher proportion of women with history of induced abortion in the depression group when compared to the non-depression group. This study revealed that attempted abortion was a risk factor to depression in teenage mothers, which was in accordance with the study of Zulcic-Nakic et al⁽²⁴⁾. However, the number and figure in this study were tended to be underestimated due to underreported or the no prenatal care cases.

Poverty and inadequate income always have influence over health particularly during pregnancy. Its ramifications over physical and psychological health particularly depression are obvious. In this study, we defined "inadequate income" as when the participants were in debt or could not cope with daily basic living expenses. From our findings, inadequate income was significantly associated with depression among teenage pregnant women, which was similar to study of Quinlivan et al⁽²⁵⁾.

Unplanned pregnancy was not found to be associated with prenatal depression in the studied population, which was similar to previous study⁽¹⁹⁾. Nevertheless, this study did not find an association of prenatal depression with history of alcohol use that was found to be an associated factor in the other study⁽²⁶⁾. Larger sample size may be needed to determine the correlation.

The advantages of those who visit a prenatal clinic are to obtain detailed and counseling over pregnancy care to pregnant women and their families. This will help to relieve stress and depression that may be incurred from not being able to assess to information or the feeling of uncertainty of health situation. Our study revealed that the non-depressed group had higher proportion of women who having more than two prenatal visits when compared to the depressed group, but not significant different. However, teenage

pregnant women should be encouraged to visit prenatal clinic regularly.

The present study revealed that a teenage with a mother with history of pregnancy during her teen period tended to have better insight and less negative attitude and provided more support to their child. Therefore, this may help to alleviate the risk of depression during pregnancy. Unfortunately, with the logistic regression analysis we could not find a significant association between depression and history of mother with teenage pregnancy. The sample size in this study might not be powered enough to find such an association.

In the same token, this study could not find any association between prenatal depression and parental or husband acceptance of the pregnancy factors. The sample size in this study might not be powered enough to show any significant association. Qualitative analysis with in-depth interview may be needed to reveal the association. This was different from previous studies that revealed that acceptance and support from the others could help teenage mothers to solve problems that might happen during pregnancy. The support would promote self-esteem and could lower depression rate^(13,27).

The limitation of this study was that the representation of the studied population could not reflect teenage pregnant women in community because our setting is a tertiary center. As mention earlier, the small sample size might not be powered enough to address all the interesting issues.

Conclusion

Teenage pregnancy tends to be increasing in Thailand. Depression during pregnancy in this particularly vulnerable group needs public attention. Attempted abortion and inadequate income in teenage mothers were shown to be significant associated factors with prenatal depression. A proper health intervention would decrease depression cases and lessen many possible pregnancy adverse events that may be incurred from the depression during pregnancy.

What is already known on this topic?

Previous literatures from worldwide reported different rates of depression in teenage pregnancy from 25.9 to 44.1%^(3,16,17). The EPDS has been used worldwide to screening depression in prenatal and postpartum women and had been tested for validation in Thai pregnant women⁽¹⁵⁾. The previous study in Thailand used differed screening tools.

The studies about associated factors with prenatal depression of teenage pregnant women were limited in Thailand.

What this study adds?

Prenatal depression rate was almost half of all teenage pregnant women. The rate tends to be increasing in Thailand.

Attempted abortion and inadequate income in teenage mothers were shown to be significant associated factors with prenatal depression and the study showed higher odd ratio.

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Potential conflicts of interest

None.

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ปัจจัยที่สัมพันธ์กับภาวะซึมเศร้าของสตรีวัยรุ่นในระยะตั้งครรภ์ในโรงพยาบาลจุฬาลงกรณ์

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วัตถุประสงค์: ภาวะซึมเศร้าระหว่างการตั้งครรภ์ ส่งผลกระทบต่อการตั้งครรภ์มากมาย อาทิเช่น การเพิ่มขึ้นของการคลอดก่อนกำหนด ทารกเติบโตช้าในครรภ์ สุขภาพของมารดาทั้งร่างกายและจิตใจ ซึ่งอาจส่งผลกระทบต่อสุขภาพของมารดาได้ ยิ่งไปกว่านั้นหากผู้ตั้งครรภ์นั้นเป็นสตรีวัยรุ่นซึ่งอยู่ในสภาวะอารมณ์อ่อนไหว ภาวะซึมเศร้าอาจเพิ่มขึ้น และผลกระทบต่าง ๆ เหล่านี้ ซึ่งอาจจะส่งผลกระทบต่อสุขภาพมากขึ้น นำมาซึ่งการศึกษานี้เพื่อหาอัตราเสี่ยงต่อการเกิดภาวะซึมเศร้าในสตรีวัยรุ่นตั้งครรภ์ในระยะก่อนคลอด และหาปัจจัยที่สัมพันธ์กับภาวะซึมเศร้าในวัยรุ่นตั้งครรภ์

วัสดุและวิธีการ: สตรีตั้งครรภ์ 200 คน อายุระหว่าง 13 ถึง 19 ปี ทำการตอบแบบสอบถาม Thai Edinburgh Postnatal Depression Scale (EPDS) ซึ่งเป็นแบบสอบถามเกี่ยวกับภาวะซึมเศร้าด้วยตนเอง หากคะแนนมากกว่าหรือเท่ากับ 11 คะแนน ถือว่ามีความเสี่ยงต่อการเกิดภาวะซึมเศร้า

ผลการศึกษา: การศึกษาในสตรีวัยรุ่นตั้งครรภ์ทั้งหมด พบภาวะซึมเศร้าคิดเป็นร้อยละ 46 อายุเฉลี่ยผู้เข้าร่วมการศึกษา 17.5 ปี อายุครรภ์เฉลี่ย 23 สัปดาห์ ประวัติการศึกษาพบว่า ร้อยละ 67 ลาออกจากโรงเรียน ร้อยละ 16 เคยพยายามทำแท้งในการตั้งครรภ์ครั้งนี้ ปัจจัยเกี่ยวกับการไม่ได้วางแผนการตั้งครรภ์ การตกงาน การลาออกจากการศึกษา และการตั้งครรภ์ในแต่ละไตรมาส ไม่สัมพันธ์กับการเกิดภาวะซึมเศร้าในวัยรุ่นตั้งครรภ์ การนำปัจจัยที่เกี่ยวข้องมาวิเคราะห์การถดถอยโลจิสติกพบสองปัจจัยที่สัมพันธ์กัน อย่างมีนัยสำคัญทางสถิติคือ การพยายามทำแท้ง (OR 8.03, 95% CI 1.59 to 40.37) และการมีรายได้ไม่เพียงพอ (OR 4.16, 95% CI 1.35 to 12.83)

สรุป: ภาวะซึมเศร้าพบมากในสตรีวัยรุ่นตั้งครรภ์ที่มารับการตรวจที่โรงพยาบาลจุฬาลงกรณ์ การพยายามทำแท้งและการมีรายได้ไม่เพียงพอสัมพันธ์กับการเกิดภาวะซึมเศร้าในสตรีวัยรุ่นตั้งครรภ์อย่างมีนัยสำคัญทางสถิติ