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## Patterns of Perinatal Depression and Stress in Late adolescent And Young Adult Mothers

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### Abstract

**Objective**—To compare symptoms of depression, maternal adjustment, and perceived stress in late adolescent and young adult mothers and to examine the patterns of these symptoms during the first 3 months after birth.

**Design**—Secondary analysis of existing longitudinal data.

**Setting**—San Francisco Bay Area with participants in their home environment

**Participants**—Ethnically diverse women who were expecting their first infants were recruited during the third trimester from childbirth education classes and antenatal clinics. The final sample included thirty-four participants in the late adolescent group (18–20 years) and 48 participants in the young adult group (21–24 years).

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Disclosure

The authors report no conflict of interest or relevant financial relationships.

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**Methods**—The Center for Epidemiologic Studies Depression Scale was used to assess depression symptoms; the Maternal Adjustment and Maternal Attitudes Scale was used to assess maternal adjustment; and the 10-item Perceived Stress Scale was used to assess perceived stress. Repeated measures ANOVA were used to examine changes over time in depression, maternal adjustment, and perceived stress scores.

**Results**—Compared to young adult participants, late adolescent participants had higher mean depression scores ( $F_{(1, 61)} = 8.02, p = 0.006$ ) and perceived stress scores ( $F_{(1, 62)} = 9.45, p = 0.003$ ) at all time points. Scores for maternal adjustment could not be compared because of the low internal validity of the instrument.

**Conclusions**—Results indicate that late adolescent mothers may have more symptoms of depression and stress in late pregnancy and the early postpartum period than young adult mothers. Clinicians in maternity and pediatric settings should be vigilant in screening for depression and stress in this vulnerable population during their transition to motherhood.

### Keywords

adolescent pregnancy; perinatal depression; postpartum depression; stress; maternal adjustment

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Although the perinatal period (pregnancy through the postpartum period) is a joyful time for most women, it is associated with an increased risk for developing perinatal mood disorders (Iliadis et al., 2016). Common mood disorders include antenatal depression, baby blues, and postpartum depression (PPD). Defined as the new onset of depression symptoms during pregnancy, antenatal depression can affect as many as 28% of women (Verreault et al., 2014) and has been associated with preterm birth, intrauterine growth restriction, and lower infant birth weight (Jarde et al., 2016; Liou, Wang, & Cheng, 2016; Saeed, Raana, Saeed, & Humayun, 2016). Unlike PPD, baby blues presents within the first two weeks after childbirth and affects as many as 80% of all new mothers (Hirst & Moutier, 2010). Symptoms are usually mild and consist of feeling sad, teary, or irritable (Dalfen, 2009). Often self-limiting in nature, baby blues usually resolves on its own without treatment (Langan & Goodbred, 2016).

Postpartum depression is defined as the onset of an affective mood disorder that occurs anytime during the first 12 months after childbirth and affects one in nine women (Tebeka, Le Strat, & Dubertret, 2016). Symptoms of PPD can range from mild emotional lability, fatigue, and irritability to more severe clusters of symptoms that meet the criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013), including comorbid anxiety and disinterest in self-care or care of the infant (Langan & Goodbred). When left untreated, PPD can disrupt the maternal-child bond (Dubber, Reck, Müller, & Gawlik, 2015); contribute to infant cognitive and language development delays (Sohr-Preston & Scaramella, 2006); and lead to postpartum psychosis, including higher risks of maternal suicide and infanticide (Friedman & Resnick, 2009).

Well-established risk factors for PPD include a previous history of depression (Silverman et al., 2017), antenatal depression (Kettunen & Hintikka, 2017), low socioeconomic status (Goyal, Gay, & Lee, 2010), poor social support (Kettunen & Hintikka), and history of

intimate partner violence (Howard, Oram, Galley, Trevillion, & Feder, 2013). Other risk factors include sleep deprivation (Goyal, Gay, & Lee, 2009) and nutritional deficits (Werner, Miller, Osborne, Kuzava, & Monk, 2015).

Researchers have suggested that age is a risk factor for PPD, and that women in certain age groups are at higher risk than others (Gauthreaux et al., 2017). Adolescent mothers are at a greater risk of developing PPD because of multiple psychosocial issues, including poor social support (Verreault et al., 2014). Other risk factors for PPD that are unique to adolescent mothers include body dissatisfaction (Zaltzman, Falcon, & Harrison, 2015), substance use (Hipwell, Murray, Xiong, Stepp, & Keenan, 2016), negative feelings towards the pregnancy (Melzer-Brody, 2013), and social isolation from family and peers (Nunes & Phipps, 2013). In addition, adolescents differ from young adults in that they are cognitively immature and may lack the ability to think in abstract terms or anticipate future consequences of their actions (Cauffman et al., 2010). As a result, adolescent mothers may experience poor maternal adjustment, have poor skills with which to cope with perceived stress, and experience more difficulty adjusting to the maternal role than adult women; these factors place them at increased risk for developing PPD (DeVito, 2010; Figueiredo, Tendais, & Dias, 2014).

For a first-time, adolescent mother, the newborn often represents new demands and stressors during an already tumultuous developmental stage that hinder adjustment to motherhood (DeVito, 2010). In DeVito's qualitative study of 126 adolescent mothers aged 13–19 years, participants relied heavily on their own mothers for infant care needs because of lack of knowledge, for example, what to do when the infant cried. Thematic analysis revealed participants experienced “being caught between two worlds,” and “alone and desperate” (p. 28). Although Fagan and Lee (2010) suggested that supportive relationships and relationship satisfaction may be protective against PPD in adolescent mothers, most research findings indicated that many of these mothers lack support from friends, family, and partners (Meltzer-Brody, 2013; Nunes & Phipps, 2013; Wahn & Nissen, 2008).

Despite the fact that adolescent mothers are at a higher risk for PPD, research is limited in this vulnerable population and little is known about the trajectory of depression during the perinatal period compared to young adult mothers. Therefore, the purpose of our study was to describe and compare patterns of perinatal depression symptoms, maternal adjustment, and perceived stress in a sample of late adolescent (18–20 years of age) and young adult (21–24 years of age) mothers beginning in the third trimester and continuing through three months postpartum.

## Theoretical Framework

Our study was guided by the *Person* domain within the Theory of Symptom Management. This theory posits that many health and personal characteristics, such as reproductive status, age, and education, can influence the symptom experience. For our study and its target population, we also incorporated knowledge about adolescent development and hypothesized that the experience of depression symptoms would be associated with specific

developmental age groups and pregnancy characteristics such as type of birth (Humphreys et al. 2014).

## Methods

### Participants

The data for this secondary analysis were drawn from the control groups of two large longitudinal clinical trials designed to improve maternal sleep in the postpartum period (Lee & Gay, 2011). Parity was controlled by recruiting only first-time mothers, and health status was controlled by recruiting only low risk pregnant women in the last month of pregnancy with no indications of pregnancy complications. Both studies were approved by the Committee on Human Research at the University of California, San Francisco, and all participants provided written informed consent. Data from 34 women who met inclusion criteria for late adolescence (18–20 years of age) and 48 women who met inclusion criteria for young adult (21–24 years of age) were included in this analysis from the larger samples. Participants in the original studies were recruited between 2001 to 2003 and 2004 to 2008 using convenience sampling during their third trimesters from childbirth education classes and antenatal clinics in San Francisco, CA. They were expecting their first infant and were English literate. Detailed eligibility criteria for the two trials have been previously reported (Lee & Gay, 2011).

All participants provided demographic information (age, race-ethnicity, marital status, monthly income, educational level, employment status) and information related to pregnancy history during the third trimester. During the first two weeks after birth, participants provided information related to type of birth (vaginal, cesarean), length of stay for mother and newborn, and infant's gender and birth weight via phone.

### Instruments

**Depression symptoms**—Symptoms associated with depression were assessed in the third trimester and at 1, 2, and 3 months postpartum using the Center for Epidemiologic Studies-Depression (CES-D) 20-item scale (Radloff, 1977). This well-validated, self-report measure has been used to assess frequency of depression symptoms in adolescent and young adult women (Easterbrooks, Kotake, Raskin, & Bumgarner, 2016). Participants were asked to rate their symptoms during the prior week by indicating how often they felt a particular symptom from 0 (*rarely/none or less than one day*) to 3 (*most/all of the time or 5–7 days*). Scores can range from 0 to 60, and higher scores indicate more frequent depression symptoms. A cut-off score of 16 or greater indicates risk for clinical depression in adolescent and adult populations (Vilagut, Forero, Barbaglia, & Alonso, 2016). Participants with scores  $\geq 16$  were referred to their primary care providers for evaluation.

To estimate internal consistency reliability for the CES-D, Cronbach alpha coefficients were calculated for both age groups at the four time periods. Cronbach alpha coefficients for the late adolescent group were acceptable: 0.75, 0.87, 0.89, and 0.80 respectively. Cronbach alpha coefficients for the young adult group were also acceptable: 0.89, 0.79, 0.81, and 0.87

respectively. To evaluate reading ease of the instrument, Flesch-Kincaid Readability level was calculated. The Flesch-Kincaid grade level was 4.2, an appropriate level for adolescents.

**Perceived stress**—Perceived stress was estimated during the third trimester and at 1, 2, and 3 months postpartum using the 10-item Perceived Stress Scale (PSS; Cohen, Kamark, & Mermelstein, 1983). This instrument was designed to measure how an individual currently perceives life to be stressful. Each item is scored between 0 (*never*) to 4 (*very often*). PSS scores range from 0 to 40, and higher scores indicate higher levels of perceived stress. Normative values for this scale are  $14.2 \pm 6.2$  for 18–29 year olds (Cohen & Williamson, 1988).

To estimate internal consistency reliability for the PSS, Cronbach alpha coefficients were calculated for both age groups at the four time periods. Cronbach alphas for the 18–20 year old group were acceptable: 0.83, 0.82, 0.77, and 0.83 respectively. Cronbach alphas for the 21–24 year old group were also acceptable: 0.78, 0.68, 0.79, and 0.78 respectively. The Flesch-Kincaid grade level for this instrument was 3.2 and thus appropriate for adolescents.

**Maternal adjustment**—The 12-item Attitudes to Pregnancy and Baby subscale from the Maternal Adjustment and Maternal Attitudes (MAMA) questionnaire was used to estimate adjustment to motherhood (Kumar, Robson, & Smith, 1984). Items specifically address questions about worry or regret about the pregnancy or baby, and responses are scored from 1 (*never*) to 4 (*very often*). The score is calculated as an average of the 12 items to yield a final score that ranges from 1 to 4; higher scores indicate more positive adjustment to motherhood.

To estimate internal consistency reliability for the 12-item MAMA maternal adjustment subscale, Cronbach alpha coefficients were calculated for each age group at the three time periods after birth. Internal consistency reliability for the 12-item scale was unsatisfactory; Cronbach alpha coefficients did not reach an acceptable level of .70 (DeVellis, 2017). Coefficients for the late adolescent group were 0.48, 0.53, and 0.67 respectively and for the young adult group, they were 0.55, 0.56, and 0.54 respectively. Even with up to four items deleted, Cronbach alpha coefficients did not reach .70 and therefore the scale could not be used to describe maternal adjustment.

However, the Flesch-Kincaid grade level for this instrument was 4.8 and appropriate for the adolescent population. Given this result, items from the scale were selected if they were correlated greater than .50. At 3 months postpartum two items met this criterion in both groups: *proud of being a mother* and *happy you have a baby*. Therefore, the mean of these two items was used for comparison only at the final time point. The Pearson correlation coefficient for these 2 items was .77 in the late adolescent group and .51 in the young adult mothers at three months postpartum.

## Procedures

After informed consent was obtained, in-home appointments were scheduled with each participant for data collection. Data collection time points were as follows: T0 (days before delivery  $21.6 \pm 10.9$  (median 22 days); T1 (days after delivery  $26 \pm 5.6$  (median 26 days);

T2 (days after delivery  $59 \pm 10.3$  (median 60 days); and T3 (days after delivery  $90 \pm 10.8$  (median 89 days).

## Analysis

Descriptive analyses were used to describe participant characteristics. Pearson correlations were calculated to determine relationships among continuous variables such as perceived stress and depression symptoms at each time point and the 2-item MAMA score at time 3. Repeated measures analyses of variance (RMANOVA) were used to examine changes over time in depression symptoms and perceived stress for late adolescent participants compared to young adult participants. The RMANOVA analyses for depression (CES-D) and perceived stress (PSS) had one between-subjects factor (age group) with two levels (18–20 year olds and 21–24 year olds) and one within-subjects factor (time) with four levels (last month of pregnancy, 1, 2, and 3 months postpartum). If the assumption of sphericity was violated as indicated by Mauchly's test, a Huynh-Feldt correction was applied for all within-subjects effects (all epsilon values  $> 0.80$ ; Huynh & Feldt, 1976). The RMANOVA for the 12-item maternal adjustment (MAMA) scale was not performed due to low internal consistency reliability. The data were analyzed using SPSS version 23.0 (IBM, Armonk, NY).

## Results

### Participant Characteristics

Participants were ethnically diverse, and most were partnered, unemployed, and reported monthly incomes of less than \$1250 (Table 1). The incidence of vaginal birth was similar between groups. A statistically significant difference was noted related to education level: more young adult participants completed high school ( $n = 21, 44\%$ ) than late adolescent participants ( $n = 10, 29\%$ ,  $p = .003$ ). Additionally, a trend was noted in exclusive breastfeeding: more young adult participants breastfed ( $n = 23, 55\%$ ) than adolescent participants ( $n = 9, 30\%$ ,  $p = .10$ ).

### Depression Symptoms (CES-D)

As described in Table 2, CES-D scores were significantly higher in the late adolescent group than in the young adult group ( $p = 0.006$ ). There was a statistically significant change in depression scores over the four time points ( $p = 0.03$ ), and scores generally declined over time for both groups. There was no interaction between age group and time (Figure 1 illustrates CES-D depression scores over time for both age groups).

The CES-D scores were correlated with the 2-item maternal adjustment score at the final time point ( $r = 0.27$ ,  $p = .025$ ), which indicated that a lower depression score, or fewer symptoms of depression, was associated with being more proud of having an infant and being more happy as a mother. CES-D scores were highly correlated with PSS scores at each time point ( $r = 0.66$  to  $0.76$ ), which indicated that perceived stress and depression symptoms captured similar concepts in this sample of first-time young mothers.

### Maternal Adjustment (MAMA)

We found no significant difference in the 2-item mean scores for the MAMA measure of maternal adjustment between the two age groups at 3 months postpartum ( $t = 0.93$ ,  $p = 0.36$ ). Given the lack of internal consistency for the scale in these two age groups, no further analyses of these scores were performed.

### Perceived Stress (PSS)

As outlined in Table 3, mean PSS scores were significantly higher in the late adolescent group than in the young adult group ( $p = 0.003$ ). There was a statistically significant change in PSS scores over time ( $p = 0.01$ ); scores generally declined from the antepartum to the postpartum period. There was no interaction between group and time (. Figure 2 illustrates PSS scores over time by age group. PSS scores were also correlated with the 2-item mean MAMA score at 3 months postpartum ( $r = 0.372$ ,  $p = .002$ ), which indicated that lower perceived stress was associated with being more proud of having an infant and being more happy as a mother.

### Discussion

The results of our study indicated that both age groups had similar patterns of depression symptoms and perceived stress over time. However, late adolescent participants reported more symptoms of depression and higher perceived stress than young adult participants during late pregnancy and the early postpartum period. Findings from previous longitudinal studies by Abdollahi (2015) and Lara et al. (2015) addressed depression at only two or three time points or did not distinguish primiparas from multiparas. Moreover, these studies were conducted in Iran and Mexico, respectively, indicating a gap in U.S.-based research that our study filled. Furthermore, many researchers have examined depression in the antenatal or postpartum period (Underwood, Waldie, D'Souza, Peterson, & Morton, 2016a; Vliegen, Casalin, & Luyten, 2014). We examined depression symptoms over four time points during the perinatal transition to first-time motherhood to better elucidate how depression symptoms in late adolescent and young adult mothers vary over this critical time period.

In one previous longitudinal study of primiparous and multiparous adult women (mean age = 30.6), scores on the Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1987) were higher (worse) during pregnancy and improved over time (Underwood, Waldie, D'Souza, Peterson, & Morton, 2016b). This was also true for participants in both age groups in our study. However, our findings shed new light on risk for PPD in late adolescent mothers, an understudied demographic group. While the CES-D has minimal items that may tap into somatic symptoms of pregnancy, such as poor appetite or restless sleep, higher scores during late pregnancy may be partially explained by these somatic symptoms. A clinical interview to evaluate symptoms uniquely associated with clinical depression should be considered for future studies of PPD in adolescent and young adult mothers.

As in our sample and in other studies, lower depression scores (Rouhe et al., 2015) and perceived stress scores (Wan, Sharp, Howard, & Abel, 2011) were associated with better maternal adjustment. However, only Figueiredo, Tendais, and Dias (2015) compared

maternal adjustment and maternal attitudes (MAMA) between adolescents and adults. Using a cross sectional study design, these researchers assessed maternal adjustment at a single time point during the prenatal period in a sample of Portuguese women who were 13 to 44 years of age using the 60-item MAMA tool. They defined adolescents as 19 years and younger and also included multiparas. They found that adolescents had worse maternal adjustment when compared to adult women. While our findings are contradictory, results should be interpreted with caution due to the unacceptable internal consistency of the MAMA subscale of the instrument in our sample.

As confirmed in our sample, symptoms of depression are also correlated with perceived stress (Underwood et al, 2016b). Assessing perinatal stress symptoms in the clinic setting is imperative, since stress at this time is highly correlated with depression symptoms. Further, research findings indicated that stress may contribute to adverse birth outcomes and impaired child development (D'Souza et al, 2016; Karam et al., 2016; Liou et al., 2016). Given the paucity of research regarding perceived stress during the perinatal period, our findings provide a more in-depth examination of how perception of stress changes from the antenatal to the early postpartum period in late adolescent and young adult mothers. In addition, the results of our study provide new insight into stress patterns in late adolescent mothers that have not been previously reported.

According to the Theory of Symptom Management, variables within the *Person* domain (developmental, physiological, sociological, psychological, and demographic) influence how the individual perceives and responds to a symptom (Dodd, Miaskowski, & Paul, 2001). In our study, participants were largely unemployed and had low incomes regardless of their ethnicity and age. Unemployment and lower income status could have weighed heavily on the participants' perception of stress and maternal adjustment, which may have directly affected their experience of symptoms suggestive of depression. In addition, the adolescent participants were less likely to breast feed and had lower levels of educational attainment, both risk factors for PPD (Borra, Iacovou, & Sevilla, 2015; Goyal et al., 2010). Furthermore, as a concept within the developmental component of the *Person* domain, maturation may also affect how a symptom is experienced (Dodd et al., 2001). Our findings support the maturation concept and provide evidence that late adolescent first-time mothers experienced more frequent symptoms of depression and had higher perceived stress than young adult first-time mothers. These factors could also be related to unplanned pregnancy or a perceived loss of common experiences of adolescence.

### Strengths and Limitations

The results of our study are limited by a secondary analysis of data collected from two previous studies that dictated sample size and variables available for analysis. Although small sample size could have influenced some of the non-significant results in this study, strengths of our study include an ethnically diverse sample of first-time young mothers with low incomes. Participants in previous studies on perinatal depression and stress had little ethnic diversity or lacked women from lower socioeconomic groups (Howard et al., 2014; Underwood et al., 2016b). The psychometric properties of the MAMA 12-item subscale on maternal adjustment are questionable in younger mothers during the early postpartum period

and further research is needed on this measure. Since we focused on late adolescent mothers, our findings may not generalize to adolescents less than 18 years of age. Finally, the data for this secondary analysis were merged from two studies completed in 2005 and 2008, and may have limited generalizability to current adolescent and young adult mothers.

### Conclusion and Implications

We found that depression symptoms and perceived stress generally decreased over time for the adolescent and young adult women in our sample. However, adolescent mothers had more depression symptoms and perceived stress than young adult mothers at each time point assessed. The perinatal period can be a difficult time for late adolescent mothers. Assessment, identification, and treatment of symptoms of depression and stress reduction strategies are vital to help this age group adjust to their new roles as mothers. Within the United States, only three states (New Jersey, Illinois and West Virginia) that mandatory screening for PPD (Rhodes & Segre, 2013); however, screening should not be limited by state law. Nurses and nurse practitioners are in key roles to evaluate and intervene with adolescent and young adult mothers. To further test the Theory of Symptom Management, more research is needed about when and where to conduct appropriate assessments and interventions for a new young mother in order to optimize maternal adjustment and health outcomes for her and her child.

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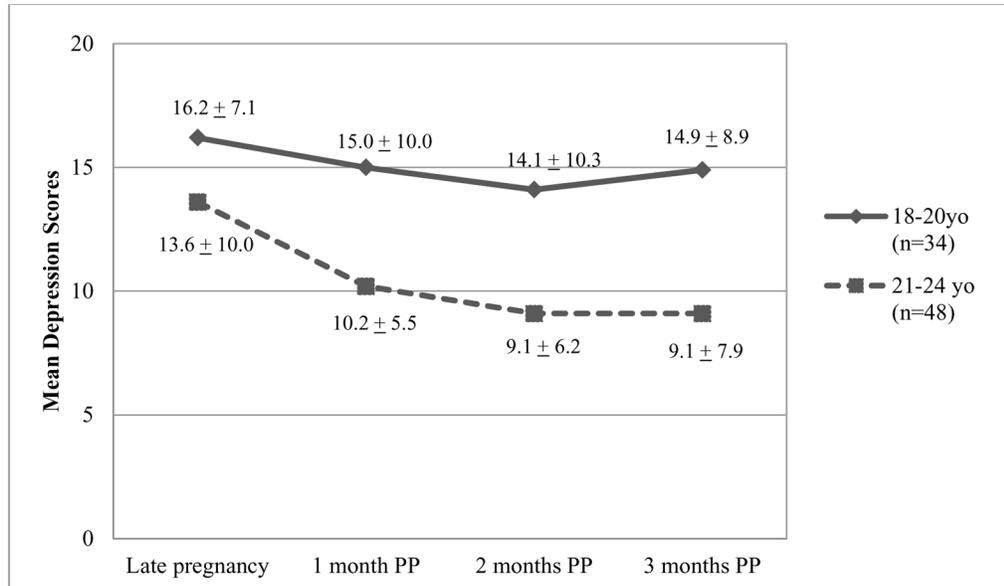
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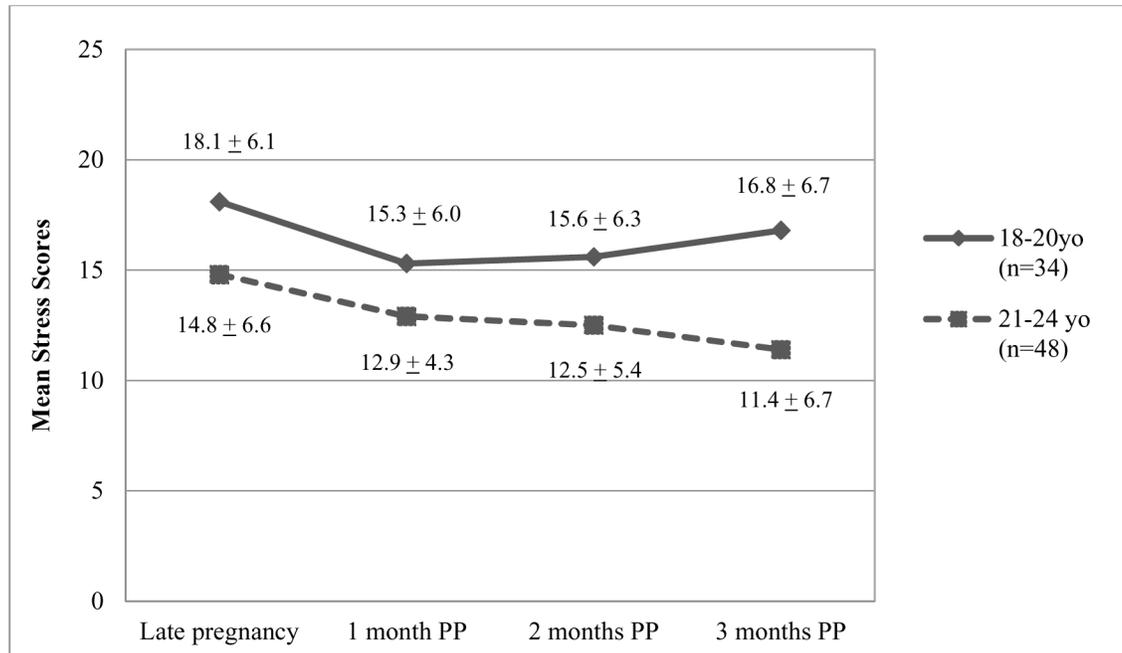
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## Callouts

1. Little is known about the prevalence and trajectory of perinatal depression in late adolescent mothers or whether differences exist when compared to young adult mothers.
2. Late adolescent mothers had more frequent symptoms of depression and higher perceived stress than young adult mothers during the perinatal period.
3. Clinicians must be vigilant in screening first-time late adolescent mothers for depression symptoms and stress.



**Figure 1.**  
Depression symptom scores over four time points for each age group.



**Figure 2.**  
Stress scores over four time points for each age group.

**Table 1**

## Characteristics of Participants

Demographic	Late Adolescents (18–20 years old) <i>n</i> =34	Young Adults (21–24 years old) <i>n</i> =48
	<i>n</i> (%)	<i>n</i> (%)
Race		
Asian	4 (12)	15 (31)
Black	8 (23)	8 (17)
Latina	12 (35)	12 (25)
White	6 (18)	8 (17)
Other	4 (12)	5 (10)
Partnered		
Yes	28 (82)	41 (85)
No	6 (18)	7 (15)
Monthly Income		
< \$1250	15 (44)	19 (40)
1250 – 2000	11 (32)	11 (23)
\$2001 – 3000	3 (9)	9 (19)
> \$3000	1 (3)	6 (13)
Education **		
< High school	12 (35)	4 (8)
High School Grad	10 (29)	21 (44)
Some College	12 (35)	14 (29)
College Graduate	0 (0)	9 (18)
Employed		
Yes	10 (29)	12 (25)
No	24 (71)	36 (75)
Infant Gender		
Girl	12 (35)	24 (50)
Boy	19 (56)	24 (50)
Type of Birth		
Vaginal Birth	25 (74)	36 (75)
Cesarean Birth	7 (21)	12 (25)
Infant Feeding Type *		
Breastmilk only	9 (30)	23 (55)
Breast milk and formula	8 (27)	9 (21)
Formula only	13 (43)	10 (24)

\*  $p = 0.10$ ,\*\*  $p < 0.005$

**Table 2**

Repeated measures analysis of variance for CES-D scores

Effect	MS	df	F	Huynh-Feldt Significance ( <i>p</i> )	Partial Eta <sup>2</sup>
Time	163.8	2,41	3.41	.03	.05
Time x Age	35.0	2,41	0.79	.51	.01
Age	1258.7	1	8.02	<.001	.12

**Table 3**

Repeated measures analysis of variance for PSS scores

Effect	MS	df	F	Huynh-Feldt Significance ( <i>p</i> )	Partial Eta <sup>2</sup>
Time	263.9	2.58	4.17	.01	.06
Time x Age	30.6	2.58	1.25	.29	.02
Age	772.4	1	9.45	<.0005	.13