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Depression and anxiety among postpartum and adoptive mothers

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Abstract

Similar to biological mothers during the postpartum period, women who adopt children experience increased stress and life changes that may put them at risk for developing depression and anxiety. The purpose of the current study was to compare levels of depression and anxiety symptoms between postpartum and adoptive women and, among adoptive women, to examine associations between specific stressors and depressive symptoms. Data from adoptive mothers ($n=147$), recruited from Holt International, were compared to existing data from postpartum women ($n=147$). Differences in the level of depression and anxiety symptoms as measured by the Inventory of Depression and Anxiety Symptoms among postpartum and adoptive women were examined. Associations between specific stressors and depressive symptoms were examined among adoptive mothers. Postpartum and adoptive women had comparable levels of depressive symptoms, but adoptive women reported greater well-being and less anxiety than postpartum women. Stressors (e.g., sleep deprivation, history of infertility, past psychological disorder, and less marital satisfaction) were all significantly associated with depressive symptoms among adoptive women. The level of depressive symptoms was not significantly different between the two groups. In contrast, adoptive women experienced significantly fewer symptoms of anxiety and experienced greater well-being. Additionally, adoptive mothers experienced more depressive symptoms during the year following adoption when the stressors were present. Thus, women with these characteristics should be routinely screened for depression and anxiety.

Keywords

Adoption; Depression; Postpartum; International adoption; Anxiety

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Introduction

Depression

Postpartum depression (PPD) affects approximately 13% of women following childbirth (Gaynes et al. 2005; O'Hara and Swain 1996), and it represents a significant health concern among new mothers. The occurrence of stressful life events, such as life changes associated with caring for a new baby, are one of several factors associated with the development of PPD (O'Hara and Swain 1996). Because increased stress is linked to depression during the postpartum period, women who adopt children may be also at risk for developing depression. Postpartum and adoptive women may experience similar life changes; however, the stressors associated with having a biological child may be different from stressors associated with adopting a child. Research in the area of depression symptoms among adoptive mothers has been lacking, and it remains unclear whether adoptive mothers experience depression similar to postpartum women.

To date, few studies have assessed the prevalence of depression and its correlates among adoptive mothers. A cross-sectional, retrospective study compared the current and lifetime prevalence of affective disorders in women having both adopted children and biological children to women who had adopted children only (Dean et al. 1995). The researchers conducted clinical interviews with the women using the Psychiatric Assessment Schedule (Dean et al. 1983). Participants were asked to recall mood symptoms during the 12 months following either childbirth or child placement in the home. Participants included in the study had adopted a child up to 34 years prior to the interview. The prevalence of major depression was 8% for the adoption only group and 16.5% for the postpartum group, a significant difference. A similar study by Fields et al. (2010) evaluated the prevalence rate of depressive symptoms following adoption. Participants had adopted one or more infants in the last 5 years. A modified EPDS was used to retrospectively assess depressive symptoms for three distinct time intervals following adoption: month 1, months 2–3, and months 4–12. The highest rate (27.9%) of participants with a composite score of ≥ 12 on the EPDS was seen in the first month following adoption, and there was a downward trend for the following months. Depressive symptoms were significantly associated with self-reported stress and adjustment difficulties. Taken together, these studies suggest that adoptive women may experience fewer depressive symptoms than postpartum women, and depression following adoption is related to increased stress and poorer adjustment. However, the results from these two studies should be interpreted with caution due to their retrospective assessment of depressive symptoms.

Prospective and cross-sectional studies have also examined depressive symptoms following adoption. As part of a larger study, Gair (1999) examined the EPDS scores of 19 adoptive women of young children up to the age of five. Of the 19 women, six (32%) had a composite score of ≥ 12 on the EPDS. In that study, mothers' quality of sleep and children's symptoms (e.g., colic, screaming) were associated with maternal depressive symptoms. Senecky et al. (2009) assessed depressive symptoms 6 weeks following adoption using the Beck Depression Inventory (Beck et al. 1961), and compared the results to published norms for postpartum women. The adoptive mothers ($n=39$) had levels of mood-related symptoms comparable to those of postpartum women. These studies suggest that rates of depression following adoption and childbirth are comparable and that the correlates of depressive symptoms among postpartum women are similar to those in postpartum women. However, generalizations are limited due to a small sample sizes in both studies and the homogeneous adoptive sample comprised of upper class Israeli women and lack of a control group in the study by Senecky et al. (2009).

Larger, correlational studies have yielded additional information about the specific stressors associated with adoption. Gjerdingen and Froberg (1991) assessed several variables as predictors of overall mental health in new mothers who had either given birth or adopted a baby. Results indicated first-time adoptive mothers had better overall mental health than first-time biological mothers. For the 108 adoptive mothers, mental distress was associated with physical problems, lower levels of social activities, fatigue, chronic medical conditions and sleep loss. In a similar study, Viana and Welsh (2010) examined predictors of parenting stress among internationally adopting women ($n=143$). Higher levels of depressive symptoms, higher expectations of child behavior/emotional problems, and a greater number of children pre-adoption significantly predicted parenting stress 6 months post-adoption. In addition, concurrent depressive symptoms, and reports of child behavioral/emotional problems predicted higher parenting stress above pre-adoption predictors. Thus, larger studies have detected greater depressive symptoms among postpartum women compared to adoptive women, although in comparison to more traditional epidemiological studies, these sample sizes are quite small. Depressive symptoms among adoptive mothers were related to physical complaints, social difficulties, medical problems, child behavioral and emotional problems, and parenting stress. Notably, these correlates are similar to those experienced by women with PPD (O'Hara and Swain 1996).

Anxiety

Increasing research has addressed the issues of anxiety in the postpartum period and its comorbidity with depression (Wenzel 2011). Low maternal income, self-esteem, and self-efficacy are predictors of prenatal anxiety (Sayil et al. 2006). Additionally, the presence of prenatal anxiety significantly increases a woman's odds of an anxiety disorder and depression during the first 7 months postpartum (Grant et al. 2008). Due to similarities in the rates of depression and anxiety in the postpartum and the increased risk of postpartum psychopathology associated with prenatal anxiety, assessment of both depression and anxiety is warranted.

Stressors

Several of the stressors related to PPD may be similar to factors that contribute to depression in adoptive women. For example, previous research suggests that the onset of depressive symptoms during the postpartum period is strongly associated with a child's sleep pattern and maternal fatigue (Dennis and Ross 2005). Women who adopt children may also experience changes in sleep and fatigue that are associated with caring for a young child (Gair 1999). Similarly, low marital satisfaction and a history of depression are associated with PPD (O'Hara and Swain 1996) and maybe associated with depression following adoption.

Despite the obvious similarities between postpartum and post-adoptive women, there are also important differences between these groups. For example, low family income, low occupational status, depression during pregnancy, and pregnancy and delivery complications are important stressors for depression among postpartum women (O'Hara and Swain 1996). However, adoptive families are generally characterized by a high occupational status and income level, which are necessary to offset the significant costs of adoption. For example, the fees associated with international adoption range between approximately \$16,500 and \$30,000, not including travel expenses (Holt International 2009). Adoptive mothers also differ from biological mothers in that they do not experience pregnancy or delivery complications, which precludes them from experiencing these important stressors related to depression (O'Hara and Swain 1996). In addition, adoptive women do not experience biological changes associated with giving birth, such as estrogen and progesterone withdrawal, which may contribute to the onset of PPD (Bloch et al. 2000).

Adoptive mothers may experience stressors uniquely associated with becoming an adoptive parent that do not affect biological mothers. For example, infertility is one of the primary reasons that families decide to adopt children (Hollingsworth 2000). Infertility is associated with depressive symptoms and substantial long-term psychological distress among women (McQuillan et al. 2003). Although the issue of infertility arises before the adoption process has been initiated, the effects of infertility are thought to be long lasting and may continue during the post adoptive period. In addition, the adoption process can take a significant amount of time and resources, and the process can defy parents' expectations including feelings of lack of control and communication (Foli and Thompson 2004). Thus, the degree of difficulty associated with the adoption process and the associated stress may also be significantly related to the onset of depression among adoptive mothers. Few studies have examined marital adjustment following adoption (Ceballo et al. 2004). Extant research suggests that while disagreements between spouses increase following adoption, overall marital quality also increases (Ceballo et al. 2004).

The primary goal of this study was to examine current depression and anxiety symptoms among postpartum and adoptive women. We hypothesized that adoptive women would experience significantly lower levels of depression and anxiety symptoms relative to postpartum women, given the results of previous studies (Dean et al. 1995; Senecky et al. 2009; Navarro et al. 2008; Ross and McLean 2006; Sayil et al. 2006; Grant et al. 2008).

The secondary goal of this study was to identify stressors associated with depressive symptoms among adoptive women. Based on previous studies of postpartum and adoptive mothers, we hypothesized that increased difficulty with and time spent in the adoption process, history of infertility, self-reported history of a psychological disorder, marital dissatisfaction, and sleep deprivation would be associated with increased depressive symptoms among adoptive mothers (Ceballo et al. 2004; Dennis and Ross 2005; Gair 1999; O'Hara and Swain 1996; McQuillan et al. 2003; Foli and Thompson 2004).

Materials and methods

Participants

Adoptive women—Participants were recruited through Holt International adoption agency. The agency sent 745 e-mail messages to mothers who had returned home with their child in the previous 12 months inviting them to participate in the study. The messages contained a link to a set of secure online questionnaires, and women could respond at their convenience. The elements of consent were on the landing page, which participants were required to read before starting the survey. While completing the questionnaires, participants could skip any questions they did not feel comfortable answering. Although the questionnaires were completely anonymous, multiple submissions from the same IP address were eliminated by the survey software so that each participant was only allowed to submit one survey. Questionnaire submissions were collected from December 2008 to January 2009. Of the women invited to participate, a total of 147 (19.7%) submitted questionnaire data, and these data were included in the final analyses.

Postpartum women—The data used for the postpartum group ($n=147$) were selected from an existing data set of participants ($n=1,033$) enrolled in a previous study conducted at the University of Iowa's Iowa Depression and Clinical Research Center. Women in this study were invited to participate based on having delivered a child within the past year. The mothers were sent a letter inviting them to participate. Interested mothers sent back a postcard and were mailed questionnaires, which they completed and returned along with a signed copy of the informed consent form. For the current analyses, postpartum women were matched to adoptive women based on a variable representing time since becoming a

mother. This variable was calculated for the postpartum women by subtracting the child's date of birth from the day the questionnaires were filled out, and for the adoptive women by subtracting the number of days since home placement from the day the questionnaire was filled out. At the time the questionnaires were completed, the average time since birth/adoption was 177 days (range=6–264 days). Both of the studies from which participant data were analyzed were reviewed and approved by the Institutional Review Board at the University of Iowa.

Measures

Demographic questionnaire—The demographic questionnaire obtained each participant's age, child's age, racial/ethnic background, marital status, years of education, and approximate total household income. Women also were asked whether they had received a diagnosis of depression or an anxiety disorder in the past.

Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al. 2007)—

The IDAS is a self-report measure designed to assess specific symptoms of depression and anxiety experienced within the last 2 weeks. The IDAS contains ten specific symptom scales: suicidality, lassitude, insomnia, appetite loss, appetite gain, ill temper, well-being, panic, social anxiety, and traumatic intrusions. It also contains two broader scales: general depression and dysphoria, which assesses core emotional and cognitive symptoms of depression and anxiety. The general depression scale contains items that overlap with the ten specific symptoms scales and may be thought of as a brief, global assessment of depressive symptomatology, whereas the dysphoria scale contains only unique items not included in other scales. Items are rated on a scale of 1–5 with a higher score representing more severe depressive or anxious symptomatology. Internal consistency for each subscale was satisfactory, with α levels ranging from 0.71 to 0.92 and from 0.63 to 0.92 for the postpartum and adoptive samples, respectively. Additionally, the IDAS shows strong stability over a 1-week retest interval and has a mean retest correlation of 0.79 (Watson et al. 2007). The IDAS also demonstrates excellent convergent and discriminant validity (Watson et al. 2007).

Edinburgh Postnatal Depression Scale (EPDS; Cox et al. 1987)—The EPDS is a ten-item self-report measure designed to assess symptoms of PPD. Response categories are scored 0–3 according to increased severity of each symptom. Mothers who score above 12 points are likely to be depressed (Cox et al. 1987). The sensitivity and specificity of the EPDS has been found to be 0.85 and 0.77, respectively (Cox et al. 1987). The EPDS demonstrated adequate internal consistency for both samples in this study ($\alpha=0.86$, postpartum sample; $\alpha=0.88$, adoptive sample).

Dyadic Adjustment Scale (DAS; Spanier 1976)—The DAS is a 32-item self-report measure that was designed to assess the quality of marriage relationships and other similar dyads. It was designed for use with either married or unmarried cohabiting couples. The DAS can be scored using a composite of all items or can be divided into four subscales consisting of components of dyadic adjustment including: dyadic satisfaction, dyadic cohesion, dyadic consensus, and affectional expression. The DAS demonstrates good convergent validity. In particular, it had a correlation of 0.86 with the Locke–Wallace Marital Adjustment Scale in a group of married individuals (Spanier 1976). The total scale reliability for the adoptive sample was satisfactory ($\alpha=0.90$).

Sleep Deprivation Questionnaire (Dennis and Ross 2005)—Questions tapping sleep deprivation were adapted from a previous study that assessed infants' sleep patterns and their impact on mothers (Dennis and Ross 2005). Dennis and Ross (2005) created the

questions on an ad hoc basis to fit the specific purpose of their study, and no psychometric data are available. The questions were modified slightly to fit the population of adoptive mothers (e.g., the word baby was changed to child).

Adoption questionnaire—Several additional questions were created to assess factors uniquely linked with adoption that were hypothesized to be related to maternal depression. Participants were asked to rate the degree of difficulty they experienced with regard to the adoption process; the amount of time spent in the adoption process; the amount of time spent receiving infertility treatments, and the degree to which her infertility currently bothers her on a 5-point Likert scale.

Procedures

Both groups completed the demographic questionnaire, IDAS and EPDS. Adoptive women also completed the DAS, sleep questionnaire, and adoption questionnaire.

Analyses

Despite the matching procedure used to establish a comparable postpartum group, important demographic variables differed between the two groups. As a consequence, analysis of covariance (ANCOVA) was used to make between-group comparisons of depression and anxiety symptoms as measured by the IDAS and EPDS. Bonferroni correction was set at 0.004 to control for multiple comparisons. Analyses controlled for differences in income level but not for differences in maternal age or education level because neither was significantly associated with depression and anxiety symptoms (all $p > 0.10$).

We were particularly interested in how much of the variance in depressive symptoms could be accounted for by the questions from the Sleep Deprivation Questionnaire and Adoption Questionnaire; however, there were several variables of interest, and as a result, composite scores were created to assess “sleep deprivation” and “difficulty with the adoption process.” Table 1 contains the items hypothetically related to these constructs, and Table 2 contains the inter-item correlations. The average inter-item correlation for each composite falls within the optimal range (0.15–0.40) (Clark and Watson 1995), and thus, composite scores were used for the purpose of the regression analysis.

A hierarchical linear regression was used to determine the amount of additional variance in depressive symptoms accounted for by stressors associated with adoption after controlling for demographic variables and the presence of a past psychological disorder. The IDAS general depression scale was the dependent variable.¹ Demographic variables, including age, level of education, and income, were entered into the first block as predictors. The presence of a self-reported past psychological disorder was entered into the second block. Variables associated with becoming an adoptive mother, including difficulty with the adoption process, time (in months) spent in the adoption process, sleep deprivation, the degree to which the participant is currently bothered by infertility, time spent undergoing fertility treatments, and marital satisfaction, were entered into the third block.

¹The IDAS general depression scale (i.e., the dependent variable) includes items assessing sleep. However, because sleep was entered as a predictor variable, data were reanalyzed excluding the sleep items from the general depression scale, which yielded the same pattern of significant results. In addition, the same pattern of results emerged when the dysphoria scale, which does not contain any items that assess sleep, was used as the dependent variable.

Results

Comparison of demographic variables

Demographic information for both samples is shown in Table 3. A comparison of demographic data indicated there were no significant differences in race/ethnicity or marital status between postpartum and adoptive mothers. However, adoptive women had a significantly higher income level, were older, and had completed more years of education than the postpartum women.

The index child's age was also significantly different between the two groups. Adoptive children were significantly older than biological children. Child's age was not statistically controlled in analyses comparing the two groups because the age range was different enough between the two groups that it would serve as a proxy for group membership, and controlling for child's age would therefore eliminate group differences. Because of the matching strategy used, there was no significant difference between groups in the amount of time children had been living with their mothers.

Comparison of depression and anxiety symptoms

Table 4 shows average levels of depression and anxiety symptoms for both groups. Adoptive and postpartum women reported comparable levels of depressive symptoms as measured by the EPDS. An EPDS score of 13 has been shown to distinguish postpartum women with major depression from postpartum women without major depression (Cox et al. 1987). The number of women with an EPDS score of greater than or equal to 13 was not significantly different between the two groups. There were no significant differences between adoptive and postpartum women on the following IDAS scales: general depression, dysphoria, lassitude, insomnia, suicidality, appetite loss, appetite gain, and ill temper. However, adoptive women reported significantly greater well-being than postpartum women. Adoptive women also reported significantly less psychopathology than postpartum women on the social anxiety, panic, and traumatic intrusion scales.

Predictors of depressive symptoms among adoptive mothers

As shown in Table 5, age, income, and education were entered into the first block of the regression and accounted for 8% of the variance. Past psychological disorder was entered in the second block and accounted for an additional 9% of the variance. Duration of and difficulty with the adoption process, sleep deprivation, the degree to which the participant is currently bothered by infertility, time spent on infertility treatments, and marital adjustment were entered in the third block and contributed an additional 19% of the variance. The full model accounted for 35% of the variance in the adoptive women's depressive symptoms. Within the full model, past psychological disorder, sleep deprivation, the degree to which one is bothered by infertility, and marital adjustment were significantly associated with depressive symptoms. In contrast, age, level of education, income level, duration of the adoption process, difficulty with the adoption process, and time spent on infertility treatments were not associated with depressive symptoms (see Table 5).

Discussion and conclusion

Results from this study suggest that postpartum and adoptive mothers experience comparable levels of depressive symptoms. However, the adoptive women experienced significantly fewer symptoms of anxiety, including social anxiety, panic, and traumatic intrusions, and experienced greater well-being than the postpartum women. Although biological and psychosocial variables associated with depressive symptoms are at least partially distinct for adoptive and postpartum women, the groups in this study appear to have

an equal vulnerability to depressive symptoms. For example, some biological mothers may experience an increased sensitivity to the changes in ovarian hormones that accompany birth, which are associated with depression during the postpartum (Bloch et al. 2000). Whereas biological factors associated with childbirth could not influence depressive symptoms among adoptive mothers, a history of infertility was significantly associated with depressive symptoms following adoption in this study. Thus, while the specific vulnerabilities to depressive symptoms might be different between biological and adoptive mothers, the net effect of these vulnerabilities appears to be the same. This is consistent with a previous study (Senecky et al. 2009) that showed similar levels of depressive symptoms between postpartum and adoptive mothers, albeit in a smaller sample.

The results of this study suggest that adoptive women experience fewer anxiety symptoms than postpartum women. This is consistent with previous studies demonstrating less psychopathology among adoptive mothers than postpartum women (Gjerdingen and Froberg 1991; Dean et al. 1995). This may be a function of the biological changes associated with childbirth or pregnancy and delivery complications, both of which have been shown to increase the risk for anxiety disorders during the postpartum (Wenzel et al. 2005). Additionally, the selection criteria used by the adoption agency to screen prospective mothers may also contribute to lower levels of anxiety symptoms present in adoptive women. For example, anxious women interested in adoption may be less likely to start or successfully complete the screening process. Thus, adoptive women may be less susceptible to anxiety due to the absence of biological changes associated with the birth process, stress and anxiety concerning delivery complications, and successful completion of the screening process required by the adoption agency.

Finally, results also showed that women reporting greater sleep deprivation, a history of infertility, a self-reported past psychological disorder diagnosis, and lower marital satisfaction experienced more depressive symptoms during the first year following adoption, which is consistent with previous literature on major depression among women (e.g., Ceballo et al. 2004; Dennis and Ross 2005; McQuillan et al. 2003). Women possessing one or more of the above characteristics may be at greater risk for experiencing depressive symptoms following the adoption of a child and should be targeted for additional follow-up concerning their mood.

Major strengths of this study relative to previous research included assessing current psychopathology using well-validated measures of depression and anxiety symptoms, the inclusion of a control group, and the assessment of social risk factors for depression. Limitations of the study included the sole use of self-report measures to assess depression and anxiety symptoms. The adoption-related variables (e.g., difficulty with adoption process) were based on retrospective assessment. It was not possible to determine with confidence the causal relation between the social stress variables and depression and anxiety symptoms. Depression and anxiety symptoms were assessed at a single time point, as such the time course of symptoms during the first year could not be ascertained as in previous studies (Fields et al. 2010). Although participants were informed that their responses were anonymous, they may have been less likely to endorse depressive or anxious symptoms given that mental health concerns are sometimes used as exclusionary criteria by adoption agencies. Finally, this study included mothers affiliated with one private, international adoption agency, and it is unclear whether the results generalize to mothers completing domestic adoptions or mothers who adopted a child through a foster care institution. Future studies should examine the prevalence of depression and anxiety disorders among adoptive mothers using clinical interviews and identify characteristics of adoptive women that make them less susceptible to experiencing depression and anxiety symptoms.

In summary, the severity of depressive symptoms does not differ between postpartum and adoptive mothers. In contrast to postpartum women, adoptive women experience significantly fewer symptoms of anxiety and greater well-being than postpartum women. Additionally, adoptive mothers with greater sleep deprivation, a history of infertility, a past psychological disorder, and less marital satisfaction experience more depressive symptoms during the year following adoption. Thus, women with these characteristics should be screened for depression and anxiety at post placement visits, so that prevention programs can be developed to effectively target these women. Despite the relatively small number of adoptive mothers likely to experience an anxiety or mood disorder following adoption, screening should be a priority given the large body of previous research that suggests maternal depression is associated with internalizing and externalizing symptoms (Essex et al. 2001; Campbell et al. 2009), cognitive difficulties (Hay et al. 2008) and later depressive symptoms (Bureau et al. 2009) in children. Prospective research in this area is warranted to determine the prevalence of depression and anxiety disorders among adoptive mothers and to better understand which factors contribute to the overall well-being that adoptive mothers experience. Research examining risk factors for depression and anxiety among adoptive mothers could lead to advances in identifying at-risk mothers. This research may advance the development of interventions designed to prevent and treat these symptoms in adoptive mothers, leading to improved outcomes for adoptive mothers and children. Finally, increased awareness of post-adoption depression could lead to women seeking treatment resources more readily and reduced guilt and shame associated with depression following adoption.

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Table 1

Items assessing difficulty with the adoption process and sleep disturbance

Difficulty with the adoption process items
1. I experienced delays during the adoption process.
2. I feel my privacy was invaded during the adoption process.
3. The adoption process was what I expected it to be. (R) ^a
4. I am happy with the amount of communication from my adoption agency. (R)
Sleep items
5. How well has your child slept, on average over the last 2 weeks?
6. How many times has your child woke up during the night, on average over the last 2 weeks?
7. How often did you feel tired or fatigued, on average over the last 2 weeks?

^aReverse-keyed item

Table 2

Inter-item correlations among items assessing difficulty with the adoption process and sleep disturbance

Item	1	2	3	4	5	6	7
1	–						
2	0.43	–					
3	0.46	0.36	–				
4	0.32	0.36	0.59	–			
5	0.13	0.11	–0.01	0.04	–		
6	0.13	0.15	0.10	0.11	0.47	–	
7	0.09	0.16	0.03	0.17	0.29	0.23	–

Table 3

Demographic variables

	Postpartum mothers			Adoptive mothers		
	Mean	SD		Mean	SD	
Age	31.5	4.7		39.6	6.1	t -12.7 <0.001
Years of education	15.8	2.3		17.2	2.3	-5.4 <0.001
Child's age	0.5	0.29		2.1	0.26	7.7 <0.001
	n	%		n	%	χ^2 p
Ethnicity						0.7 0.39
Caucasian	125	85.0		130	88.4	
Ethnic/racial minority	18	15.0		17	11.6	
Marital Status						4.1 0.24
Married	127	86.4		137	93.2	
Separated	1	0.7		0	0.0	
Divorced	2	1.4		1	0.7	
Single	17	11.6		9	6.1	
Income Level						48.7 <0.001
<\$20,000	14	9.5		0	0.0	
\$20,000–\$80,000	81	55.1		36	25.4	
>\$80,000	52	35.4		106	74.6	

Table 4

Depression and anxiety in postpartum and adoptive women

	Postpartum mothers			Adoptive mothers			<i>F^a</i>	<i>p^b</i>
	Mean	SD		Mean	SD			
IDAS								
General depression ^c	36.9	11.9		35.3	11.1		4.4	0.007
Dysphoria	17.0	7.0		16.7	6.5		3.6	0.013
Lassitude	11.8	4.3		11.1	3.8		2.3	0.052
Insomnia	11.4	4.9		11.1	5.2		2.2	0.057
Suicidality	6.4	1.3		6.5	1.2		2.1	0.064
Appetite loss	4.2	2.3		4.0	1.9		1.8	0.085
Appetite gain	6.3	3.2		5.7	2.6		2.2	0.058
Ill temper	8.7	3.8		8.2	3.2		1.1	0.174
Well-being	23.5	6.4		26.6	6.0		12.9	<0.001
Social anxiety	7.0	2.9		6.3	2.1		8.4	<0.001
Panic	9.7	3.2		8.6	2.1		7.2	<0.001
Traumatic intrusions	5.8	2.5		4.9	2.2		6.8	<0.001
EPDS	6.5	4.9		5.4	4.5		2.4	0.046
	<i>n</i>	%		<i>n</i>	%		χ^2	<i>p</i>
EPDS Scores > 13 ^d	11	7.5		13	8.8		0.81	0.670

^aAnalyses controlled for income level^b*p* values less than 0.004 indicate statistically significant results^cThe General Depression subscale contains items from the other IDAS subscales^dMothers who score above 13 are likely to be suffering from a depressive illness of varying severity

Table 5Factors associated with women's depressive symptoms following adoption ($n=147$)

	r^a	β^b	p	R^2	ΔR^2	p
Model 1				0.08	0.08	0.016
Age	-0.10	-0.05	0.55			
Education	0.02	0.04	0.66			
Income	-0.23	-0.26	0.003			
Model 2				0.16	0.09	<0.001
Age	-0.10	-0.05	0.51			
Education	0.02	0.01	0.91			
Income	-0.23	-0.19	0.03			
Past psychological disorder	0.36	0.30	<0.001			
Model 3				0.35	0.19	<0.001
Age	-0.10	-0.01	0.96			
Education	0.02	0.07	0.37			
Income	-0.23	-0.11	0.19			
Past psychological disorder	0.36	0.18	0.03			
Duration of adoption process	-0.71	-0.12	0.15			
Difficulty with adoption process	0.17	0.05	0.52			
Sleep deprivation	0.42	0.25	0.004			
How much infertility bothers her	0.23	0.18	0.03			
Time spent on infertility treatments	0.01	-0.10	0.19			
Marital adjustment	-0.42	-0.24	0.004			

^aZero order correlations^bStandardized β