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A comparison of depression and anxiety symptom trajectories between women who had an abortion and women denied one

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Abstract

Background—This study prospectively assesses the mental health outcomes among women seeking abortions, by comparing women having later abortions to women denied abortions, up to two years post-abortion seeking.

Methods—We present the first two years of a 5-year telephone interview study that is following 956 women who sought an abortion from 30 facilities throughout the U.S. We use adjusted linear mixed effects regression analyses to assess whether symptoms of depression and anxiety, as measured by the BSI-short form and Prime-MD, differ over time among women denied an abortion due to advanced gestational age, compared to women who received abortions.

Results—Baseline predicted mean depressive symptom scores for women denied abortion (3.07) were similar to women receiving an abortion just below the gestational limit (2.86). Depressive symptoms declined over time with no difference between groups. Initial predicted mean anxiety symptoms were higher among women denied care (2.59) than among women who had an abortion just below the gestational limit (1.91). Anxiety levels in the two groups declined and converged after one year.

Conclusions—Women who received an abortion had similar or lower levels of depression and anxiety than women denied an abortion. Our findings do not support the notion that abortion is a cause of mental health problems.

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Introduction

The relationship between abortion and subsequent mental health has been a topic of scientific debate and public interest for the past three decades (American Psychological Association Task Force on Mental Health and Abortion, 2008, National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011, Charles et al., 2008, Adler et al., 1992). While several reviews have concluded that there is no relationship between abortion and mental health, reviews have also called for stronger study designs including assessment of mental health prior to abortion, control for other adverse experiences which may be associated with both abortion and subsequent mental health problems, and selection of comparison groups that reflect possible alternatives to abortion for women who experience an unwanted pregnancy (American Psychological Association Task Force on Mental Health and Abortion, 2008, National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011, Charles et al., 2008, Adler et al., 1992). Few studies have been designed specifically to examine the relationship between abortion and subsequent mental health (National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011). Instead, many rely on secondary analyses of data collected for other purposes and retrospective recall of both abortion and mental health, and have been mostly limited to women having first-trimester abortions (American Psychological Association Task Force on Mental Health and Abortion, 2008, National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011, Charles et al., 2008, Adler et al., 1992, Dingle et al., 2008, Coleman et al., 2009, Steinberg and Finer, 2012, Mota et al., 2010, Cougle et al., 2003, Steinberg et al., 2011, Steinberg and Russo, 2008). We conducted a prospective cohort study—The Turnaway Study—designed to examine the relationship between abortion and subsequent mental health and address four significant weaknesses of the literature on this topic, as identified by three major reviews including that from the American Psychological Association (1–3). First, we assess mental health in a prospective manner five times after women's abortions. Second, we focus on women seeking later abortions. Third, we compare women having later abortions to women denied abortions, an important comparison group rarely used in the literature and that represents what women's experiences would have been if they were unable to receive an abortion. We do this with a natural quasi-experimental design based on the different gestational limits of abortion facilities, and follow women seeking abortion just below a facility's gestational limit who receive abortions and women just over a facility's limit who are denied abortions. Finally, we compare trajectories of depressive and anxiety symptoms between women who have an abortion and women denied one, rather than testing differences at specific discrete points in time.

Methods

The Turnaway Study is a five-year telephone interview study looking at the impact of receiving versus being denied an abortion on women's physical and mental health and socioeconomic well-being. Study details have been published previously (Rocca et al., 2013, Gould et al., 2012, Upadhyay et al., 2013). Facilities with the latest gestational limit of any other facility within 150 miles were identified using the National Abortion Federation directory and contacts within the abortion research community. All but two facilities

recruited participated; one was replaced with a facility with a similar catchment area and similar patient volume. Gestational age limits for the 30 participating facilities' ranged from 10 weeks through the end of the second trimester.

Study participants include English- and Spanish-speaking women ages 15 or older, with no known fetal anomalies or demise, presenting for abortion care between 2008 and 2010 at facilities throughout the United States within the gestational age specifications of one of three designated study groups. Study groups were recruited in a 2:1:1 ratio and include the Near Limit Abortion group (*Near-Limits*) – women presenting for abortion up to two weeks under a facility's gestational limit and receiving abortions (n=452); *Turnaways* – women presenting for abortion up to three weeks over a facility's gestational limit and denied abortion (n=231); and the First Trimester Abortion group (*First-Trimesters*) – women who received a first trimester abortion (n=273). *Turnaways* who gave birth (*Turnaway-Births*) were evaluated separately from those who miscarried or later had an abortion (*Turnaway-No-Births*) to isolate the effect of carrying a pregnancy to term. The 15 *Turnaways* who placed their baby for adoption are included in the *Turnaway-Births. Near-Limits* serve as the reference group to allow simultaneous comparisons of *Near-Limits* with *Turnaway-Births* (main study comparison) and *First-Trimesters* (secondary comparison). *First-Trimesters* were recruited to assess if *Near-Limits*, most of whom are in the second trimester, differed from the typical experience of abortion in the United States, 90% of which occur in the first trimester (Pazol et al., 2011).

Women were interviewed by telephone eight days after abortion seeking and then every six months. Data presented here come from the first five interview waves or two years post-abortion seeking. Women are currently being followed for another three years.

We use two measures of mental health. The Brief Symptom Inventory (BSI), a validated psychological instrument, was used to assess depression and anxiety symptoms in the past week as continuous outcomes (Derogatis, 2001). The depression and anxiety subscales are each 6-items and have been used in previous research on abortion and mental health (Major et al., 2000, Major and Gramzow, 1999, Cozzarelli et al., 2000). Internal consistency reliability Cronbach's alpha coefficients were 0.82 and 0.83, respectively. Items for each subscale range from 0 "not at all" to 4 "a great deal" with total scores for each subscale ranging from 0–24 (Derogatis, 2001). The 9-item Prime MD Patient Health Questionnaire (PHQ-9) (Cronbach's α=.84) asks about symptoms in the previous two weeks and was used as an additional continuous measure of depression (Spitzer RL, 1999). The PHQ-9 was included from the second interview (six months post-abortion seeking), forward. The total PHQ-9 score for the nine items ranges from 0–27.

The main statistical analyses compare depression and anxiety symptom trajectories (levels and trends) between *Near-Limits* and *Turnaway-Births*. Longitudinal analyses assess mental health immediately (8 days) after receiving or being denied an abortion through two years. We fit adjusted linear mixed effects models for the continuous outcomes depression and anxiety symptoms (McCulloch et al., 2008).

Models include study group, time, and group by time interactions as the primary independent variables. Time was measured in months since seeking an abortion. The interaction terms assess study group differences in trajectories for each outcome. We tested whether adding group by time interactions improved the model fit using a likelihood ratio test to test for differences in trajectories by study group. Models adjust for baseline covariates that could confound the relationship between study group and mental health outcomes. Covariates include age, race/ethnicity, education, employment, parity, marital status, history of child abuse/neglect, history of depression and anxiety diagnoses, drug use prior to pregnancy recognition, and problem alcohol use (either drinking first thing in the morning or not being able to remember what happened the night before) prior to pregnancy recognition. Gestational age was not included as a covariate because, by study design, it determined study group. All analyses include random intercepts for facility to accommodate possible correlation of outcomes within facilities, as well as subject-specific random intercepts to accommodate possible correlations of outcomes within the same subject. Subject-specific random slopes and a fixed quadratic term for months were included in cases where they improved the model fit. We performed a sensitivity analysis excluding facilities where fewer than 50% of eligible participants consented, to assess whether findings were consistent in the portion of the sample less affected by potential selection bias. We used STATA 12 to conduct all analyses. The study was approved by the Committee for Human Research at the University of California, San Francisco.

Among eligible participants approached, 37.5% consented to five years of semiannual interviews, of which 85% (n=956) completed the baseline interview, with no differential participation by study group. Participation rates for eleven of the 30 facilities were over 50%. Ninety-two percent (92%) of participants who completed a baseline interview were retained at the 6-month follow-up and 77% (n=672) at 2 years. History of depression or anxiety and study group were not associated with loss-to-follow-up.

One facility with an 11-week gestational limit (n=76) was excluded from analysis because 95% of *Turnaway* participants obtained an abortion elsewhere, leaving insufficient participants who carried the pregnancy to term. Three additional participants are excluded because, after study enrollment, they reported that they had not had an abortion, leaving a final sample of 877 participants. Among the 210 remaining *Turnaway*s, 44 (21%) received an abortion elsewhere and 5 (2%) reported having a miscarriage (*Turnaway-No-Births*) later. The final four study groups included 413 *Near-Limits*, 161 *Turnaway-Births*, 49 *Turnaway-No-Births*, and 254 *First Trimesters*.

Results

Mental health history, educational level, marital status, and prior drug and problem alcohol use were similar across groups (Table 1). By design, gestational age at recruitment differed across study groups. At baseline, when compared to *Near-Limits* ($M = 24.9$), *Turnaway-Births* were younger ($M = 23.4$) and *First-Trimesters* were older ($M = 25.9$). Relative to *Near-Limits* (54%, 224/413), *Turnaway-Births* were less likely (40%, 64/161) and *First-Trimesters* were more likely to be employed (63%, 161/254). *Turnaway-Births* had lower

parity, and *Turnaway-No-Births* were less likely to report a history of child abuse or neglect than *Near-Limits*.

Depression

In a model of responses to depression measures in the BSI, significant likelihood ratio tests (p<.01, not shown) indicated that subject-specific random slopes and fixed quadratic terms for time improved the model fit and are included in the adjusted linear mixed effects regression model of depressive symptom trajectories (Table 2). In the model without group by time interactions, overall depressive symptoms declined over time (B=−0.15, CI: −0.18, −0.11 for months not shown). Including group by time interactions improved the model fit suggesting that group trajectories differ. Table 2 and Figure 1 present the results of the linear mixed effects regression model with group by time interactions. As indicated by the significant linear (months) and quadratic components (months squared) of depressive symptom trajectories, depressive symptoms decline non-linearly over time for *Near-Limits* (the reference group). As indicated by the two non-significant group by time interactions (*Turnaway-BirthsXMonths*, *Turnaway-No BirthsXMonths*), depressive symptom trajectories for *Turnaway-Births* and *Turnaway-No-Births* do not differ significantly from *Near-Limits*. In contrast, as indicated by the significant *First-TrimesterXMonths* interaction, depressive symptom trajectories for *First-Trimesters* differ significantly from *Near-Limits*. Specifically, *First-Trimesters* start with fewer depressive symptoms and their decrease is more gradual when compared to *Near-Limits*. According to predicted values based on this model, mean depressive symptoms shortly after getting or being denied an abortion (baseline) are similar for *Turnaway-Births* (*M* = 3.07), *Turnaway-No-Births* (*M* = 3.19), and *Near-Limits* (*M* = 2.86), but significantly lower for *First-Trimesters* (*M* = 2.19, p=0.02).

In the adjusted model predicting depressive symptoms from 6 months to two years after seeking an abortion using the PHQ-9, likelihood ratio tests indicated that fixed quadric terms did not improve the model fit (p>.05) but subject-specific random slopes (p<.001) did. Thus, subject-specific random slopes are included in the adjusted linear mixed effects regression model of PHQ-9 depressive symptom trajectories. The model without group by time interactions indicates that PHQ-9 depressive symptoms do not decline over time (B=−0.00, CI: −0.03, 0.03 for months not shown). Adding group by time interactions did not improve the fit of the model (likelihood ratio test, p=.2915) indicating that trajectories for PHQ-9 depression do not differ by group. This is further confirmed in the model with the group by time interactions, where depressive symptoms did not differ by study group at 6 months after seeking abortion nor were there any differences in depressive symptom trajectories over time (Table 3).

Anxiety

Random slopes for individual and quadratic terms for time improved the fit (likelihood ratio tests, p<.01) of the anxiety symptoms model, and are included. The model without group by time interactions indicates that anxiety symptoms decline over time (B=−0.07, CI: −0.11, −0.04 for months not shown). Adding group by time interactions improves the fit of the model (likelihood ratio test, p<.01) indicating that trajectories for anxiety symptoms differ by group, decreasing for *Near-Limits*, *Turnaway-Births*, and *Turnaway-No-Births* and

remaining steady for *First-Trimesters* (Table 2 and Figure 1). Anxiety symptoms declined more rapidly among the *Turnaway-Births* and *Turnaway-No-Births* compared to the *Near-Limits*. According to model-based predicted values, mean levels of anxiety one week post-abortion seeking are significantly higher for *Turnaway-Births* (2.59) and *Turnaway-No-Births* (4.05) than for *Near-Limits* (1.91), and similar across groups after approximately one year.

Sensitivity Analyses

When we limit our sample to the 11 facilities with a participation rate greater than 50%, results are similar in direction but not in magnitude when compared to main analyses. In this restricted sample, depressive symptom trajectories between *First-Trimester* and *Near-Limits* no longer differ significantly by study group although the direction of the effects are similar (not shown). Statistically significant differences in anxiety symptom trajectories between *Near-Limits* and both *Turnaway* groups remain in the restricted sample. Differences in in the trajectories comparing the *First-Trimesters* and *Near-Limits*, remain similar in magnitude, however they are no longer significant in the restricted sample.

Discussion

If women with unwanted pregnancies experienced mental health problems as a result of having an abortion, we would expect anxiety and depression symptoms to be more common or even to increase over time among women receiving an abortion. Instead, we found that among women receiving an abortion, depression and anxiety symptoms remained steady or decreased over the two years after receiving an abortion. We did not find that anxiety or depressive symptoms were more common among women having abortion. Rather we found that initial and subsequent levels of depression were similar between women who received and women who were denied abortions near the facility gestational limit. Levels of anxiety symptoms were initially higher among those denied an abortion compared to those receiving one, but again the two groups converged over time.

While women in the *Near-Limit* group had later abortions than typical in the U.S. (15), the comparison with the *First-Trimester* group suggests mental health experiences of women having later versus earlier abortions do not differ and that later abortions may not have more mental health consequences than first trimester abortions. Women in the *First-Trimester* group initially had fewer depressive symptoms than those receiving abortions closer to the facility's gestational limit, but these differences were not sustained over time.

Among women initially denied an abortion, 21%, primarily those at a lower gestational age, went on to receive an abortion elsewhere. The greater anxiety symptoms among women who terminated their pregnancies after initially being denied may be a function of the stress of having to continue to search for an abortion or, alternatively, the experience of anxiety may motivate the continued search for an abortion.

This study has a number of strengths. The first is its comparison groups. The one known study comparing mental health among women having abortions to women denied abortions was conducted in the U.K. in 1995 (Gilchrist et al., 1995). It looked at clinical diagnoses that

resulted in hospital admissions, rather than mental health symptoms. Most studies have compared women who terminate pregnancies to women who have never had an abortion, never been pregnant, or miscarry, or all women who give birth, without regard to pregnancy intention (American Psychological Association Task Force on Mental Health and Abortion, 2008, National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011, Charles et al., 2008, Adler et al., 1992). By comparing two groups of abortion-seeking women, we were able to ensure that factors associated with the experience of an unintended pregnancy and the decision to terminate—factors that may contribute to women's depression or anxiety— were similar in both study groups.

Second, most previous research on abortion and mental health has been conducted with women who had first trimester abortions (American Psychological Association Task Force on Mental Health and Abortion, 2008). This study has a large sample of women who received abortions in their second trimester, a group that might be thought to have a more difficult abortion experience. While we found that levels of depression among *First-Trimesters* were lower than *Near-Limits* shortly after their abortion, this difference diminished over time. In contrast, when looking at anxiety symptoms over time, there were no statistically significant baseline differences between *First-Trimesters* and *Near-Limits* or differences between the two groups over time.

A third strength of this study was that mental health data were collected longitudinally, which likely minimized error in recall, and allowed us to chart women's mental health trajectories over time. Few previous studies have done this (Charles et al., 2008). A fourth strength was that we considered the role of prior mental health, child abuse/neglect, alcohol and drug use, and socio-demographic factors, all of which may influence both timing of presentation for abortion and subsequent anxiety and depressive symptoms. *Near-Limits* and *Turnaways* were similar on most of these characteristics at baseline, indicating that the quasi-experimental design was a success. Consistent with prior studies, our findings show that these factors were strongly associated with subsequent mental health outcomes (American Psychological Association Task Force on Mental Health and Abortion, 2008, National Collaborating Centre for Mental Health at the Royal College of Psychiatrists, 2011, Charles et al., 2008, Adler et al., 1992).

There were also some limitations with the study. We did not use a structured psychiatric interview to assess clinical-level mental health disorders according classifications as reported in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000, Kessler and Ustun, 2004). Instead, we used women's self-report of their mental health symptoms and resulting scores on the PHQ-9 and BSI depression and anxiety subscales to examine mental health symptoms. By relying on these measures we were able to capture the full range of symptoms.

This study had an overall participation rate of 37.5%, similar to other prospective studies of this type, (Galea and Tracy, 2007, Morton et al., 2006) and likely a consequence of the large demands of study participation (11 interviews over five years), the stigmatized nature of abortion and the requirement of providing identifying information to researchers. Our retention rate of 77% at 2 years and lack of significant differences in baseline mental health

among those participating and those subsequently lost to follow up, strengthens the validity of our findings. Although our sample (by design) is disproportionately represented by women seeking abortions later in gestation than women receiving abortion nationally, the participants' emotional responses to their abortions and demographic characteristics mirror those of national samples of women who have abortions, and our comparison to women having first-trimester abortions suggests that our results are generalizable (Jones and Kavanaugh, 2011, Jones and Finer, 2012, Rocca et al., 2013).

Finally, we could not assess whether abortion conferred benefits for women who sought abortion specifically for mental health reasons. Only one in five women in our study requested an abortion because they felt emotionally or mentally unprepared to raise a child; most gave financial or partner-related reasons or cited concern for existing children (Biggs et al., 2013).

Our findings show that neither abortion nor unwanted childbearing leads to increased risk of mental health problems among women with unwanted pregnancies. Women having near-limit abortions initially had similar levels of depression and lower levels of anxiety than women who were denied abortions and subsequently carried their pregnancies to term. Mental health differences by study group observed one week post abortion seeking were not sustained over time. Policies based on the notion that abortion harms women's mental health are not supported by this work.

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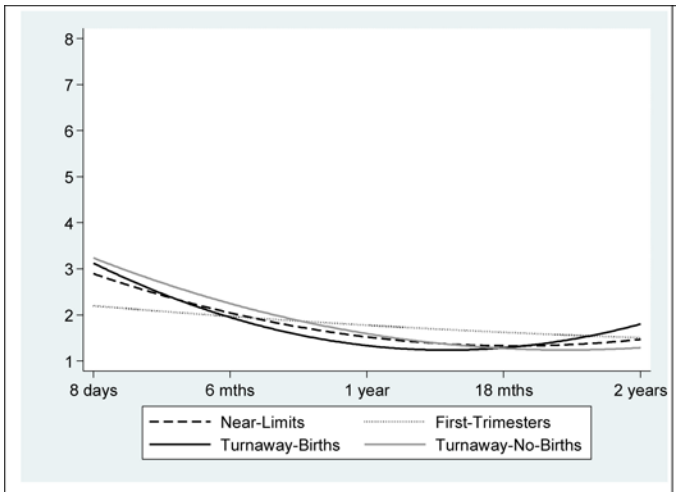

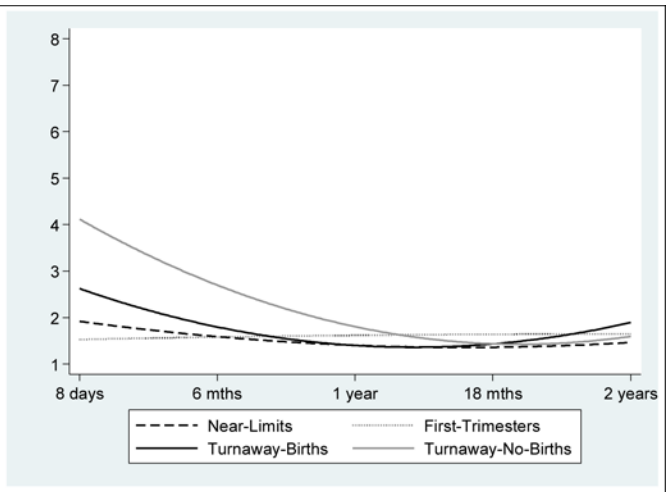

	Predicted Depressive Symptom Means Post-Abortion Seeking					Predicted Anxiety Symptom Means Post-Abortion Seeking				
Study Group	**8 days**	**6 months**	**1 year**	**18 months**	**2 years**	**8 days**	**6 months**	**1 year**	**18 months**	**2 years**
Near-Limits	2.86	2.05	1.53	1.34	1.48	1.91	1.42	1.42	1.37	1.48
Turnaway-Births	3.07	1.95	1.34	1.29	1.81	2.59	1.41	1.41	1.44	1.66
Turnaway-No-Births	3.19	2.26	1.60	1.28	1.30	4.05	1.82	1.82	1.45	1.91
First-Trimesters	2.19	1.98	1.78	1.63	1.51	1.54	1.63	1.63	1.65	1.61

Figure 1.

Women's depressive and anxiety symptom trajectories up to two years after abortion seeking, by study group

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Table 1

Characteristics of Participants by Study Group (n=877)

	Near-Limits	Turnaway- Births[a]	Turnaway- No-Births[b]	First- Trimesters[c]	P value[‡]
Demographics	**(n=413)**	**(n=161)**	**(n=49)**	**(n=254)**	
Age (mean)	24.9	23.4*	25.9	25.9*	0.001
Race/ethnicity					
White	32%	25%	43%	39%*	0.037
Black	32%	34%	29%	32%	
Hispanic/Latina	21%	29%	12%	21%	
Other	15%	13%	16%	8%	
Highest Level of Education					
<high school	18%	25%	18%	16%	0.258
High school or GED	34%	34%	27%	31%	
Associates degree, some college, technical school	40%	35%	47%	42%	
College	7%	6%	8%	11%	
Employed	54%	40%*	49%	63%*	0.001
Gestational age (mean)	19.9	23.4*	19.1*	7.8*	0.000
Parity					0.190
Nulliparous	34%	47%*	41%	38%	
Baby under 1	12%	6%	8%	11%	
1+ previous births, no baby under 1	27%	21%	27%	21%	
2+ previous births, no baby under 1	27%	26%	24%	30%	
Marital status					0.351
Single	80%	84%	78%	76%	
Married	8%	10%	6%	11%	
Divorced/Widowed	12%	6%	16%	13%	
Mental Health History					
Ever been diagnosed by a health professional with anxiety or depression					0.656
No	76%	79%	71%	70%	

	Near-Limits	Turnaway- Births[a]	Turnaway- No-Births[b]	First- Trimesters[c]	P value[‡]
Anxiety disorder only	5%	5%	4%	5%	
Depressive disorder only	8%	9%	12%	14%	
Anxiety and depressive disorder	10%	7%	12%	11%	
History of child/abuse neglect	26%	26%	12% *	28%	0.124
Prior Drug and Alcohol Use					
Prior drug use	13%	14%	8%	18%	0.185
Prior problem alcohol use	4%	7%	10%	7%	0.249

* p<.05 for comparisons between *Near-Limits* and other study groups.

[a] *Turnaway-Births* compared to *Near-Limits*;

[b] *Turnaway-No-Births* compared to *Near-Limits*;

[c] *First-trimesters* compared to *Near-Limits*

‡ P-value is based on multiple comparisons using a postestimation command.

Table 2

Longitudinal adjusted linear mixed effects regression analyses predicting depressive and anxiety symptoms based on the Brief Symptom Inventory (n=877)

	Depressive Symptoms			Anxiety Symptoms		
Predictor variables	**Coef.**	**95% CI**	**P-value**	**Coef.**	**95% CI**	**P-value**
Study Group						
Near-Limits (reference)						
Turnaway-Births	0.23	[−0.43, 0.89]	0.499	0.70	[0.10, 1.31]	0.023
Turnaway-No-Births	0.34	[−0.73, 1.41]	0.531	2.20	[1.22, 3.18]	0.000
First-Trimesters	−0.70	[−1.26, −0.13]	0.015	−0.39	[−0.91, 0.13]	0.139
Months	−0.17	[−0.22, −0.12]	0.000	−0.07	[−0.11, −0.02]	0.003
Turnaway-Births × Months	−0.07	[−0.16, 0.02]	0.108	−0.11	[−0.19, −0.02]	0.013
Turnaway-No-Births × Months	−0.02	[−0.17, 0.13]	0.759	−0.21	[−0.35, −0.07]	0.003
First-Trimesters × Months	0.13	[0.05, 0.20]	0.001	0.08	[0.01, 0.15]	0.034
Months Squared	0.02	[0.00, 0.01]	0.000	0.00	[0.00, 0.00]	0.020
Turnaway-Births × Months Squared	0.00	[0.00, 0.01]	0.064	0.00	[0.00, 0.01]	0.016
Turnaway-No-Births × Months Squared	0.00	[−0.01, 0.01]	0.982	0.00	[0.00, 0.01]	0.052
First-Trimesters × Months Squared	−0.00	[−0.01, 0.00]	0.006	−0.00	[0.00, 0.00]	0.116
Covariates						
Age	0.04	[0.01, 0.08]	0.017	0.05	[0.02, 0.09]	0.003
Race/ethnicity						
White (reference)						
Black	0.48	[0.05, 0.89]	0.028	0.20	[−0.23, 0.63]	0.356
Hispanic/Latina	0.32	[−0.15, 0.78]	0.182	0.29	[−0.17, 0.76]	0.219
Other	0.22	[−0.33, 0.76]	0.436	0.23	[−0.32, 0.78]	0.411
Highest Level of Education						
<High school (reference)						
High school or GED	−0.40	[−0.87, 0.06]	0.089	−0.04	[−0.51, 0.43]	0.874
AA, some college, tech school	−0.41	[−0.88, 0.06]	0.087	0.12	[−0.35, 0.60]	0.613
College	−0.51	[−1.26, 0.23]	0.179	0.28	[−0.48, 1.04]	0.469
Employed	−0.23	[−0.56, 0.11]	0.188	−0.48	[−0.83, −0.14]	0.005

	Depressive Symptoms			Anxiety Symptoms		
Predictor variables	**Coef.**	**95% CI**	**P-value**	**Coef.**	**95% CI**	**P-value**
Parity						
Nulliparous (reference)						
Baby under 1	0.32	[−0.25, 0.88]	0.274	0.07	[−0.51, 0.64]	0.819
1+ previous births and no baby under 1	0.08	[−0.35, 0.52]	0.710	−0.28	[−0.72, 0.17]	0.221
2+ previous births and no baby under 1	−0.43	[−0.91, 0.06]	0.086	−0.62	[−1.12, −0.13]	0.014
Marital status						
Single (reference)						
Married	0.11	[−0.47, 0.68]	0.718	0.16	[−0.43, 0.74]	0.602
Divorced/Widowed	0.12	[−0.42, 0.66]	0.662	−0.09	[−0.64, 0.46]	0.748
History of depression or anxiety diagnoses						
None (reference)						
Anxiety disorder only	0.37	[−0.37, 1.10]	0.334	0.68	[−0.06, 1.43]	0.073
Depressive disorder only	1.72	[1.19, 2.25]	0.000	1.36	[0.81, 1.90]	0.000
Anxiety and depressive disorder	2.37	[1.80, 2.93]	0.000	3.36	[2.79, 3.93]	0.000
Child/abuse neglect	0.98	[0.60, 1.35]	0.000	0.80	[0.42, 1.18]	0.000
Prior drug use	0.80	[0.33, 1.27]	0.001	0.70	[0.22, 1.17]	0.004
Prior problem alcohol use	0.89	[0.21, 1.58]	0.011	1.10	[0.40, 1.79]	0.002

Coef.=coefficient; CI=confidence interval.

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Table 3

Longitudinal adjusted linear mixed effects regression analyses predicting depressive symptoms based on the PHQ-9 (n=877)

	Depressive Symptoms		
Predictor variables	**Coef**	**95% CI**	**p-value**
Study Group			
Near Limits (reference)			
Turnaway-Births	0.29	[−0.64, 1.21]	0.542
Turnaway-No-Births	1.10	[−0.41, 2.60]	0.154
First-Trimesters	0.32	[−0.46, 1.11]	0.418
Months	0.00	[−0.03, 0.03]	0.978
Turnaway-Births × Months	−0.03	[−0.08, 0.02]	0.289
Turnaway-No-Births × Months	−0.07	[−0.15, 0.01]	0.108
First-Trimesters × Months	−0.03	[−0.07, 0.02]	0.219
Covariates			
Age	0.02	[−0.02, 0.07]	0.280
Race/ethnicity			
White (reference)			
Black	0.50	[−0.03, 1.03]	0.062
Hispanic/Latina	0.69	[0.11, 1.26]	0.019
Other	0.06	[−0.62, 0.74]	0.870
Highest Level of Education			
Less than high school (reference)			
High school or GED	−0.93	[−1.52, −0.34]	0.002
Associates, some college, tech. school	−0.87	[−1.46, −0.28]	0.004
College	−1.25	[−2.19, −0.32]	0.009
Employed	−0.26	[−0.68, 0.17]	0.236
Parity			
Nulliparous (reference)			
Baby under one	0.03	[−0.68, 0.73]	0.944
1+ previous births and no baby under 1	0.58	[0.04, 1.14]	0.037
2+ previous births and no baby under 1	0.08	[−0.53, 0.69]	0.807
Marital status			
Single (reference)			
Married	−0.01	[−0.73, 0.71]	0.975
Divorced/Widowed	−0.06	[−0.74, 0.61]	0.851
History of depression or anxiety diagnoses			
None (reference)			
Anxiety disorder only	0.77	[−0.15, 1.69]	0.102
Depressive disorder only	1.98	[1.31, 2.65]	0.000
Anxiety and depressive disorder	3.27	[2.57, 3.97]	0.000
Child/abuse neglect	1.21	[0.74, 1.67]	0.000

	Depressive Symptoms		
Predictor variables	**Coef**	**95% CI**	**p-value**
Prior drug use	0.49	[−0.10, 1.08]	0.103
Prior problem alcohol use	0.65	[−0.20, 1.51]	0.135