

Behavioral Activation and Postpartum Mental Health among Mothers During the COVID-19 Pandemic

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The current study examined whether behavioral activation strategies, characterized by engaging in activities that promote well-being, such as exercise and mindfulness practices, during the COVID-19 pandemic, were associated with postpartum depressive and anxiety symptoms, and whether mental health diagnoses during pregnancy moderated these associations. Participants were 351 mothers of infants aged 8-10 months, drawn from the Perinatal Experience and COVID-19 Effects (PEACE) Study. Participants completed baseline and follow-up surveys via REDCap, assessing demographics, maternal mental health history, depressive and anxiety symptoms, and behavioral activation. Among participants, 29.7% reported clinically relevant depressive symptoms and 19.5% reported generalized anxiety symptoms; 12.8% reported a depression diagnosis and 19.4% reported a generalized anxiety diagnosis. Behavioral activation was associated with fewer postpartum maternal mental health symptoms. Mental health diagnoses during pregnancy were positively associated with postpartum mental health symptoms within this pandemic cohort. Importantly,

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depression diagnosis during pregnancy moderated the association between behavioral activation and postpartum mental health symptoms, with more behavioral activation linked to lower symptomatology, particularly for mothers with a depression diagnosis. Behavioral activation through work during the pandemic was associated with fewer postpartum mental health symptoms, especially for mothers with a depression or anxiety diagnosis. Engaging in behavioral activation may mitigate postpartum mental health symptoms among mothers with mental health diagnoses during pregnancy. Interventions that promote behavioral activation may enhance maternal resilience during crises.

Keywords: maternal mental health, depression, anxiety, diagnosis, behavioral activation, COVID-19 pandemic

The COVID-19 pandemic has impacted individuals globally, with mothers of infants facing specific challenges, including work-from-home demands, concerns about the virus, difficulty accessing childcare, sleep problems, and job insecurity (Kinser et al., 2021; Kracht et al., 2021). Such stressors during the pandemic are linked to increased maternal depressive and anxiety symptoms (Racine et al., 2021). Although individuals with pre-existing mental health conditions may be more vulnerable to the pandemic's psychosocial effects (Pfefferbaum & North, 2020; Sanchez et al., 2023), less is known about behavioral activation (e.g., engagement in meaningful or rewarding activities) brought about by the pandemic and how behavioral activation interacts with pre-existing mental health diagnoses to impact maternal well-being. This study aims to investigate associations between behavioral activation during the pandemic and postpartum maternal mental health among mothers with a depression or anxiety diagnosis during pregnancy. The findings may inform prevention and intervention strategies for enhancing maternal mental health during global health crises like the pandemic.

While most studies have focused on the negative impacts of the pandemic (Cameron et al., 2020; Chaves et al., 2022; Liu et al., 2021; Mata et al., 2021), some studies have reported behavioral activation that individuals engaged in response to the pandemic, such as spending more time with family, paying more attention to personal health, and increasing physical activity (Büssing et al.,

2021; Cornell et al., 2022; Williams et al., 2021). A small number of studies have investigated the association between behavioral activation during the pandemic and mental health in a general perinatal population (Davenport et al., 2020; Phipps et al., 2023). For example, Davenport et al. (2020) found that perinatal women engaging in more physical activity during the pandemic were associated with lower depressive and anxiety symptoms. Similarly, Phipps et al. (2023) indicated that for pregnant women, increasing physical activity could be a way to decrease anxious-depressive symptomatology during a pandemic. Several studies showed that behavioral activation, e.g., adopting coping strategies, was associated with better psychological health during the COVID-19 pandemic (Fullana et al., 2020; Lubis et al., 2024; Shamblaw et al., 2021). However, less is known about the impact of behavioral activation during the pandemic on maternal mental health, especially for those with a mental health diagnosis.

Mothers with a mental health diagnosis are more vulnerable to the pandemic's psychosocial effects and may experience more severe mental health symptoms (Pfefferbaum & North, 2020; Ravaldi et al., 2020; Sanchez et al., 2023). Behavioral activation may have a more pronounced impact on these individuals because there is greater potential for improvement (Trapani et al., 2024; Williams et al., 2021; Yan et al., 2022). For instance, a systematic review showed that behavioral activation, e.g., engaging in mindfulness practices, was effective in reducing depressive and anxiety symptoms in perinatal women with mental health conditions, whereas these practices might be less helpful for individuals without such conditions (Yan et al., 2022).

Our study sought to investigate associations between behavioral activation during the COVID-19 pandemic and postpartum mental health symptoms when infants were 8-10 months of age among mothers with a depression or anxiety diagnosis during pregnancy. We further examined the moderating role of mental health diagnoses on the association between behavioral activation and maternal mental health symptoms. We also assessed whether mental health diagnoses moderated the association between specific behavioral activation during the pandemic—mindfulness, relationships, activities, work, and generosity—and postpartum mental health symptoms. Our hypotheses were as follows:

H1: More behavioral activation during the pandemic would be associated with fewer maternal mental health symptoms.

H2: Mental health diagnoses during pregnancy would be positively associated with postpartum maternal mental health symptoms.

H3: Higher behavioral activation during the pandemic would be more strongly associated with lower maternal depressive and generalized anxiety symptoms among mothers with a mental health diagnosis than for those without a diagnosis.

As the behavioral activation we captured spanned specific domains (mindfulness, relationships, activities, work, and generosity), we also explored whether the above hypotheses would hold for each domain. As such, we ran separate models for specific activity domains.

Methods

The study included 351 individuals drawn from the Perinatal Experience And COVID-19 Effects (PEACE) Study. We collected online survey data from participants who consented to participate during the perinatal period, spanning the second trimester through six months postpartum. Participants were eligible if they were at least 18 years of age, living in the U.S., and between the second trimester of pregnancy and six months postpartum at the time of enrollment. Eligible participants completed the baseline survey between May 21, 2020 and September 15, 2021.

Participants were initially recruited through various channels, including email listservs, social media, word of mouth, and Facebook groups. A follow-up survey was conducted between November 19, 2021 and August 31, 2022, when the infants were approximately 8–10 months old. Both baseline and follow-up surveys took 30–40 minutes and were administered via REDCap. The surveys assessed maternal demographics, mental health history, mental health symptoms, and behavioral changes during the COVID-19 pandemic. Ethical approval for this study was obtained from the Institutional Review Board at Mass General Brigham. All participants provided informed consent for their data to be used in the research.

Measures

Mental health diagnoses. Mental health conditions during pregnancy were assessed through participant self-reports at the baseline survey. Participants were asked whether they had depressive or generalized anxiety disorder during their most recent pregnancy. There were four response options: “Yes, diagnosed and treated,” “Yes, diagnosed but not treated,” “Suspected, but not diagnosed,” and

“No.” For each condition, a binary variable was created: individuals diagnosed with the condition formed one group, irrespective of treatment status, and all other participants formed another group. Diagnoses were not considered mutually exclusive.

Behavioral activation. Behavioral activation engaged during the COVID-19 pandemic was assessed using 16 items from the Epidemic-Pandemic Impacts Inventory (EPII) (Grasso et al., 2020) at the follow-up survey. Participants reported the time they spent engaging in specific behaviors on a seven-point scale ranging from “Very much less” to “Very much more.” A principal component analysis (PCA) was conducted to investigate the underlying structure of behavioral activation during the pandemic (Bandalos & Finney, 2018). The final PCA on 14 items (two items were excluded due to low factor loadings) revealed five principal components. The Kaiser-Meyer-Olkin (KMO) measure was 0.75, and Bartlett’s test of sphericity was statistically significant ($\chi^2 = 1593.64$, $p < .001$), supporting the factorability of the correlation matrix (Shrestha, 2021).

After varimax rotation, five components were identified: mindfulness, relationships, activities, work, and generosity. Mindfulness (component 1) exhibited loadings between 0.42 and 0.80 on four items (e.g., “being appreciative of things usually taken for granted” and “paying attention to personal health”). Relationships (component 2) had loadings ranging from 0.51 to 0.89 across three items (e.g., “spending quality time with family or friends in person or from a distance”). Activities (component 3) had loadings of 0.55-0.63 across three items (e.g., “exercising or doing physical activity” and “spending time doing enjoyable activities like reading books and puzzles”). Work (component 4) displayed loadings of 0.67 and 0.88 on two items “being efficient in productive work or employment” and “finding meaning in work or employment”). Generosity (component 5) showed loadings of 0.75 and 0.76 on two items (e.g., “volunteering to help people in need”). A factor loading above 0.30 generally indicates a moderate item-factor correlation (Tavakol & Wetzel, 2020).

A composite total score was computed by summing 14 items to reflect overall behavioral activation. Subscale scores were calculated by summing items within each component to capture specific behavioral activation. Higher scores indicate more behavioral activation. Cronbach’s alpha values indicated acceptable reliability for the overall behavioral activation score (0.77) and for each subscale: mindfulness (0.75), relationships (0.70), activities (0.66), work (0.77), and generosity (0.75).

Depressive symptoms. Participants' self-reported depressive symptomatology was assessed using the Center for Epidemiological Studies – Depression (CES-D) (Radloff, 1977) at the follow-up survey when infants were between 8 and 10 months of age. The CES-D is a 20-item measure that evaluates feelings of hopelessness, worthlessness, and low mood experienced over the past week, as well as neurovegetative symptoms. Responses were provided on a four-point scale, indicating the frequency of each experience from “Rarely or none of the time (less than 1 day)” to “Most or all of the time (5–7 days).” A sum score was calculated, with higher scores reflecting greater subjective depressive symptoms, ranging from 0 to 60. In this study, the Cronbach's alpha for this measure was 0.91, indicating strong reliability.

Anxiety symptoms. Participants' self-reported generalized anxiety symptoms were measured using the 7-item Generalized Anxiety Disorder Scale (GAD-7) (Spitzer et al., 2006) at the follow-up survey, when infants were between 8 and 10 months of age. The GAD-7 assesses various experiences such as worry, irritability, restlessness, and dread over the past two weeks. Response options, ranging from “Not at all” to “Nearly every day”, measured the frequency of each experience. The sum of the items yields a total score, with higher scores indicating greater subjective anxiety, ranging from 0 to 21. The Cronbach's alpha for this scale in the current sample was 0.90, indicating strong reliability.

Covariates. Maternal age, household income (0 = less than \$74,999, 1 = \$74,999-149,999, 2 = \$150,000-224,999, 3 = more than \$225,000), and maternal COVID-19-related experiences were included as covariates. COVID-19-related experiences were assessed on a 5-point self-developed scale. A composite score was calculated by summing items across four dimensions (health worries, risk worries, resource worries, and grief). In the current sample, Cronbach's alpha for COVID-19-related experiences was 0.91.

Statistical Analyses

Preliminary analysis showed that the study variables confirmed a normal distribution, and the predictors showed acceptable levels of collinearity ($VIF < 5$). A series of multiple hierarchical regression models were conducted, regressing depressive and anxiety symptoms separately on predictor variables: sociodemographic characteristics and maternal COVID-19-related experiences

(Block 1), mental health diagnoses during pregnancy (Block 2), behavioral activation during the pandemic (Block 3), and the cross-product between behavioral activation and mental health diagnoses (Block 4). Analyses were conducted using SPSS 28.0.

Results

The demographic characteristics of our study sample are displayed in Table 1. On average, participants were 33.3 years old ($SD = 3.5$). The large majority of the participants identified as White (93.2%), had at least a college education (95.4%), and reported a household income over \$75,000 (89.0%). The majority were employed (86.0%) and worked remotely (85.4%). Completion dates of the baseline survey ranged from 69 to 284 days (average = 124 days) after March 13, 2020, the date the pandemic was declared a national emergency in the U.S. Among participants, 5.7% had a diagnosis of COVID-19 perinatally. In the sample, 12.8% reported a diagnosis of depression, and 19.4% reported a diagnosis of generalized anxiety during their most recent pregnancy. Among participants, 29.7% reported moderate or severe depressive symptomatology, and 19.5% reported moderate or severe anxious symptomatology.

Table 1

Demographic Characteristics and Key Variables (N = 351)

Variables	Means (SD , Range) or %
Maternal age (years)	33.3 (3.5, 22.0-50.0)
Maternal race	
White	93.2%
Black or African American	0.6%
Hispanic or Latino	3.1%
Asian and Pacific Islander	3.1%
Maternal education	
Less than college	4.6%
College	26.8%
Masters	44.2%
Doctorate	24.5%

Variables	Means (<i>SD</i> , Range) or %
Household income	
<\$74,999	11.0%
\$75,000-149,999	38.8%
\$150,000-224,999	29.1%
>\$225,000	21.1%
Employment	
Employed	86.0%
Not employed	14.0%
Telework/Work from home	
Yes	85.4%
No	14.6%
Pandemic duration (days)	124.0 (44.0, 69.0-284.0)
Diagnosis of COVID-19	5.7%
Mental health history during pregnancy	
Depression diagnosis	12.8%
Anxiety diagnosis	19.4%
Mental health symptoms	
Depression (CES-D)	12.8 (9.3, 0.0-58.0)
< 16	70.3%
≥ 16	29.7%
Anxiety (GAD-7)	5.6 (4.7, 0.0-21.0)
< 10	80.5%
≥ 10	19.5%
Behavioral activation	55.9 (10.4, 20.0-83.0)
Mindfulness	17.5 (3.8, 4.0-27.0)
Relationships	8.7 (4.0, 3.0-21.0)
Activities	10.5 (3.5, 3.0-21.0)
Work	7.1 (2.6, 2.0-14.0)
Generosity	6.5 (2.6, 2.0-14.0)

The percentages of overall and specific behavioral activation during the COVID-19 pandemic are presented in Figure 1. Overall, most participants (72.9%) reported decreased overall engagement in behavioral activation. For specific domains, 66.4% of the participants reported increased engagement in mindfulness activities, such as being more appreciative of things usually taken for granted. On the other hand, 72.4% of the participants reported decreased engagement in relationships, like spending less quality time with family or friends, and 55.6% reported decreased engagement in activities, such as exercising less or doing less physical activity. Nearly half of the participants (45.8%) reported decreased engagement in work, such as being less efficient or finding less meaning in work or employment, and 48.4% reported decreased engagement in acts of generosity, like volunteering less to help those in need.

Figure 1

Percentages of Behavioral Activation Engaged During the COVID-19 Pandemic

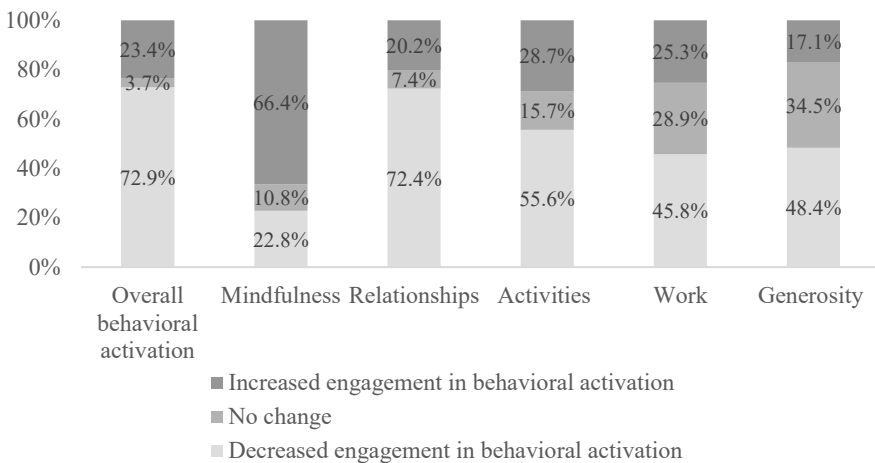


Table 2 shows associations between predictors and maternal depressive and generalized anxiety symptoms. Depression diagnosis was positively associated with active depressive symptoms ($B = 4.90$, $SE = 1.35$, $p < .001$). Generalized anxiety diagnosis was positively associated with active generalized anxiety symptoms ($B = 1.30$, $SE = 0.62$, $p < .05$). Greater behavioral activation was negatively associated with depressive symptoms ($B = -0.17$, $SE = 0.05$, $p < .001$). We observed interaction effects between behavioral activation and depression diagnosis in predicting depressive symptoms ($B = -0.36$, $SE = 0.14$, $p < .01$) and predicting generalized anxiety symptoms ($B = -0.16$, $SE = 0.08$, $p < .05$).

Table 2*Multiple Regression of Overall Behavioral Activation*

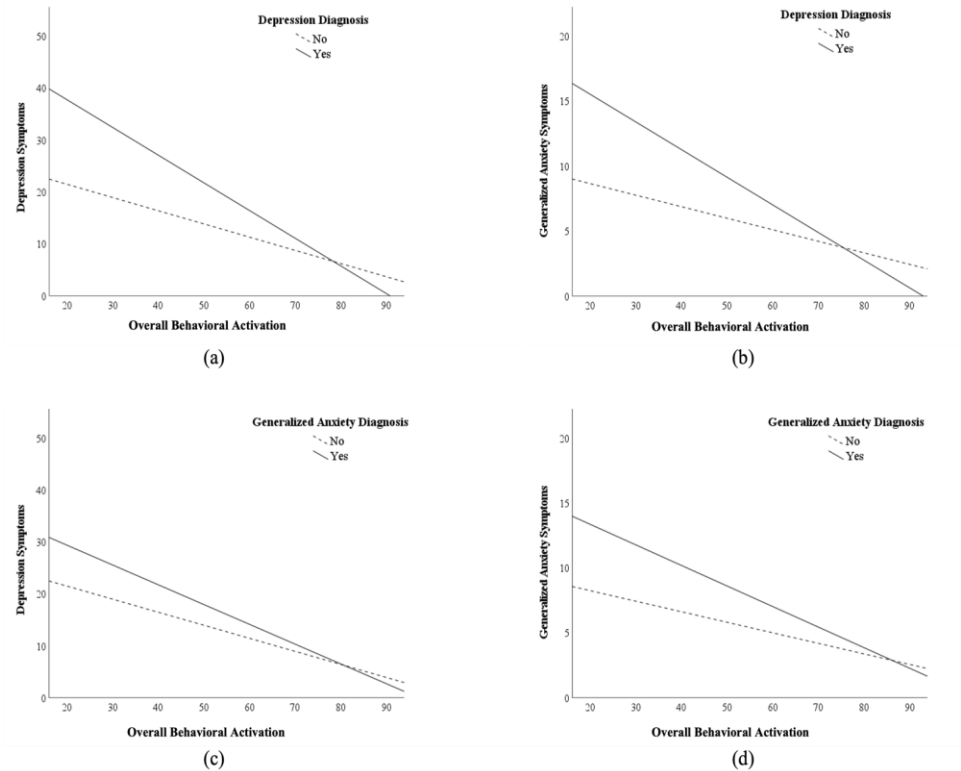
Predictor Variables	Depressive Symptoms				Generalized Anxiety Symptoms			
	<i>B</i>	β	<i>R</i> ²	ΔR^2	<i>B</i>	β	<i>R</i> ²	ΔR^2
<i>1. Covariates</i>			0.26	0.26***			0.25	0.25***
Maternal age	0.17	0.06			0.03	0.02		
Household income (ref \leq \$74,999)								
\$75,000-149,999	11.51	0.09*			2.83	0.05		
\$150,000-224,999	5.44	0.10*			0.77	0.03		
>\$225,000	-4.35	-0.08			-3.36	-0.12**		
COVID-19-related experiences	0.27	0.39***			0.16	0.45***		
<i>2. Mental health diagnoses</i>			0.31	0.05***			0.28	0.03**
Depression diagnosis	4.90	0.18***			0.97	0.07		
Generalized anxiety diagnosis	0.92	0.04			1.30	0.19*		
<i>3. Overall behavioral activation</i>	-0.17	-0.19***	0.36	0.05***	-0.02	-0.03	0.29	0.01
<i>4. Interaction terms</i>			0.37	0.01*			0.30	0.01*
Behavioral activation x depression diagnosis	-0.36	-0.14**			-0.16	-0.13*		
Behavioral activation x generalized anxiety diagnosis	0.05	0.03			0.01	0.01		

Note. Multiple regression predicting maternal depressive and generalized anxiety symptoms based on sociodemographic characteristics, mental health diagnoses during pregnancy, and overall behavioral activation during the pandemic (values are based on the full model obtained in Block 4) ($N=351$). * $p < .05$, ** $p < .01$, *** $p < .001$.

Simple slope tests revealed that higher behavioral activation during the pandemic was associated with lower levels of postpartum depressive symptoms, and this association was stronger for mothers with a depression diagnosis during pregnancy ($B = -0.50$, $SE = 0.11$, $t = -4.39$, $p < .001$) than for those without a diagnosis ($B = -0.17$, $SE = 0.04$, $t = -3.76$, $p < .001$) (Figure 2a). More behavioral activation during the pandemic was associated with reduced symptoms of postpartum generalized anxiety, but only among mothers with a depression diagnosis during pregnancy ($B = -0.18$, $SE = 0.06$, $t = -2.99$, $p < .01$) (Figure 2b). No interaction was seen between behavioral activation and generalized anxiety diagnosis in predicting either postpartum depressive or anxiety symptoms (Figures 2c and 2d).

Figure 2

Depression and Generalized Anxiety Symptoms Based on Overall Behavioral Activation During the Pandemic and Mental Health Diagnoses



Note. The moderation effects were significant in (a) and (b), but not significant in (c) and (d). For interpretation purposes, the values in the figures represent raw data values.

The effects of specific behavioral activation strategies (i.e., mindfulness, relationships, activities, work, and generosity) during the pandemic were then assessed in a new model (Table 3). Depression diagnosis was positively associated with active depressive symptoms ($B = 4.96$, $SE = 1.36$, $p < .001$). Generalized anxiety diagnosis was positively associated with active generalized anxiety symptoms ($B = 1.25$, $SE = 0.61$, $p < .05$). Behavioral activation through work was negatively associated with depressive ($B = -0.41$, $SE = 0.17$, $p < .05$) and generalized anxiety symptoms ($B = -0.21$, $SE = 0.09$, $p < .05$). Interaction effects was observed between behavioral activation through work and depression

diagnosis in predicting depressive symptoms ($B = -1.11, SE = 0.53, p < .05$) and predicting generalized anxiety symptoms ($B = -0.61, SE = 0.25, p < .05$). Another significant interaction between behavioral activation through work and generalized anxiety diagnosis was observed in predicting generalized anxiety symptoms ($B = -0.46, SE = 0.20, p < .05$).

Table 3*Multiple Regression of Specific Behavioral Activation*

Predictor Variables	Depressive Symptoms				Generalized Anxiety Symptoms			
	<i>B</i>	β	<i>R</i> ²	ΔR^2	<i>B</i>	β	<i>R</i> ²	ΔR^2
<i>1. Covariates</i>			0.26	0.26			0.25	0.25
Maternal age	0.18	0.07			0.05	0.04		
Household income (ref \leq \$74,999)								
\$75,000-149,999	11.44	0.09*			2.92	0.05		
\$150,000-224,999	6.07	0.11			1.06	0.04		
>\$225,000	-4.45	-0.08*			-3.41	-0.13**		
COVID-19-related experiences	0.26	0.38***			0.15	0.42***		
<i>2. Mental health diagnoses</i>			0.31	0.05***			0.28	0.03**
Depression diagnosis	4.96	0.18***			1.04	0.07		
Generalized anxiety diagnosis	0.66	0.03			1.25	0.10*		
<i>3. Specific Behavioral Activation</i>			0.36	0.05***			0.31	0.03
Mindfulness	-0.19	-0.08			-0.01	-0.01		
Relationships	-0.12	-0.05			0.02	0.02		
Activities	-0.21	-0.08			0.02	0.01		
Work	-0.41	-0.07*			-0.21	-0.07*		
Generosity	-0.14	-0.04			-0.14	-0.08		

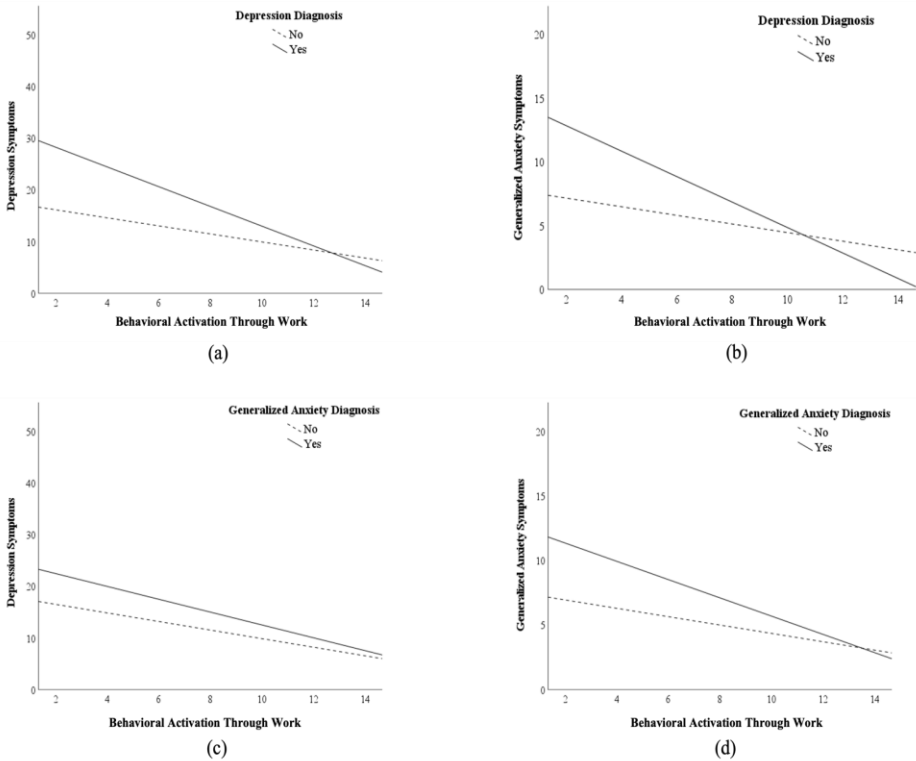
Predictor Variables	Depressive Symptoms				Generalized Anxiety Symptoms			
	<i>B</i>	β	<i>R</i> ²	ΔR^2	<i>B</i>	β	<i>R</i> ²	ΔR^2
<i>4. Interaction Terms</i>			0.37	0.01			0.32	0.01*
Behavioral activation through work x depression diagnosis	-1.11	-0.12*			-0.61	-0.12*		
Behavioral activation through work x generalized anxiety diagnosis	0.00	0.00			-0.46	-0.13*		

Note. Multiple regression predicting maternal depressive and anxiety symptoms based on sociodemographic characteristics, mental health diagnoses during pregnancy, and specific behavioral activation during the pandemic (values are based on the full model obtained in Block 4) (*N*=351). **p* < .05, ***p* < .01, ****p* < .001

Simple slope tests showed that higher behavioral activation through work during the pandemic was associated with lower postpartum depressive symptoms, and this association was stronger for mothers with a depression diagnosis during pregnancy (*B* = -1.59, *SE* = 0.43, *t* = -3.68, *p* < .01) than for those without a diagnosis (*B* = -0.40, *SE* = 0.17, *t* = -2.29, *p* < .05) (Figure 3a). As shown in Figures 3b and 3d, more behavioral activation through work was associated with decreased symptoms of postpartum generalized anxiety, but only among mothers with either a diagnosis of depression (*B* = -0.76, *SE* = 0.23, *t* = -3.37, *p* < .01) or generalized anxiety (*B* = -0.56, *SE* = 0.17, *t* = -3.28, *p* < .01). No interaction was observed between behavioral activation through work and generalized anxiety diagnosis during pregnancy in predicting postpartum depressive symptoms (Figure 3c).

Figure 3

Depression and Generalized Anxiety Symptoms Based on Behavioral Activation Through Work and Mental Health Diagnoses



Note. The moderation effects were significant in (a), (b), and (d), but not significant in (c). For interpretation purposes, the values in the figures represent raw data values.

Discussion

The present study examined associations between behavioral activation during the COVID-19 pandemic, mental health diagnoses during pregnancy, and maternal postpartum mental health symptoms when infants were between 8 and 10 months of age. Further, we examined the moderating effect of mental health diagnoses on the association between behavioral activation during the pandemic and maternal mental health symptoms. Our findings from the models of overall and specific behavioral activation showed that (1) more behavioral activation during the pandemic was associated with fewer postpartum mental health

symptoms; (2) mental health diagnoses during pregnancy were linked to active postpartum mental health symptoms; and (3) more behavioral activation during the pandemic, especially those related to meaningful work, appeared to decrease postpartum mental health symptoms, particularly for mothers with a depression or generalized anxiety diagnosis during pregnancy. Taken together, the findings suggest that increasing behavioral activation that supports maternal mental well-being can help develop prevention strategies to address the specific challenges mothers face during crises.

Our findings indicated that more behavioral activation was associated with lower postpartum depressive and anxiety symptoms in mothers of 8-10-month-old infants, aligning with previous studies on perinatal women (Davenport et al., 2020; Phipps et al., 2023). For example, a study using ANOVA analyses showed that women engaging in behavioral activation (e.g., moderate-intensity physical activity) had significantly lower anxiety and depression scores (Davenport et al., 2020). Another study suggested that increasing behavioral activation in health behaviors, such as physical activity, was beneficial for the mental health of pregnant women during a pandemic (Phipps et al., 2023). Similarly, other studies have shown that adopting behavioral activation, particularly coping strategies such as mindfulness, yoga, and seeking support, enhances mental health in perinatal women (Shidhaye et al., 2020; Trapani et al., 2024).

Consistent with the literature (O'Hara & Wisner, 2014; Ravaldi et al., 2020; Seimyr et al., 2013), we observed that mental health diagnoses during pregnancy were positively associated with maternal postpartum mental health symptoms during the pandemic. Mothers with a depression or anxiety diagnosis may face additional challenges during the pandemic, as they navigate not only their own mental health struggles but also the added stressors of managing household responsibilities, social isolation, fear of infection, childcare, financial worries, and potential employment concerns (Khoury et al., 2021; Kinser et al., 2021; Kracht et al., 2021). Additionally, it is possible that disruptions to mental health services during the pandemic left mothers without the necessary care, further worsening their conditions (Cameron et al., 2020). The present finding, in alignment with previous research, emphasizes the essential need for targeted mental health support for mothers during such global crises.

Our findings contribute to the literature by examining the moderating role of mental health diagnoses during pregnancy on the association between behavioral activation and maternal postpartum symptoms. We found that more behavioral activation was associated with fewer postpartum depressive and anxiety

symptoms, particularly among mothers diagnosed with depression during pregnancy. In line with previous studies (Badon et al., 2022; Cornell et al., 2022; Williams et al., 2021), our findings suggest that increasing behavioral activation in response to the pandemic—such as spending more time with family or friends, focusing on personal health, and engaging in mindfulness practices—may be more effective for mothers with a depression diagnosis. One possible explanation is that mothers with higher levels of depressive symptoms may experience more noticeable reductions in these symptoms as a result of behavioral activation (Trapani et al., 2024; Yan et al., 2022). Thus, individuals with more severe depression might benefit more from the implementation of behavioral activation. Another possible explanation is that, despite the pandemic reducing behavioral activation in the current sample, mothers who increased behavioral activation may have intentionally created opportunities to engage in more positive activities than before. For mothers with a mental health diagnosis, this proactive strategy may have been learned (Fullana et al., 2020; Huh et al., 2023; Shidhaye et al., 2020). The prior knowledge of adopting various forms of behavioral activation could have contributed to mothers' ability to alleviate symptoms of depression and anxiety more effectively during the pandemic (Muzik et al., 2015; Sanchez et al., 2023).

With separate models, we also tested the moderating role of mental health diagnoses on the association between specific behavioral activation—mindfulness, relationships, activities, work, generosity—and maternal mental health symptoms. Only behavioral activation through work showed a significant effect. In this study, we focus on the perceived meaningfulness of work-related activities and their effects on maternal mental health during the pandemic. We observed that more behavioral activation through work during the pandemic was linked to lower mental health symptomatology, particularly among mothers with a depression or anxiety diagnosis. A potential explanation is that work may provide mothers with a sense of purpose and fulfillment (Merida et al., 2023). Previous studies have shown that a strong belief in the meaningfulness of life, taking action to address the situation, and staying busy are beneficial behaviors during the pandemic (Garros et al., 2021; Kar et al., 2021; Kolakowsky-Hayner et al., 2021).

Additionally, it is worth noting that, although the pandemic led to a reduction in work-related activities in the present sample, individuals with a mental health diagnosis who remained engaged in behavioral activation through work were actually protected against increasing symptoms. The positive impact of work-

related behavioral activation may help maintain a sense of purpose during challenging times (Kanter et al., 2010). Overall, our findings suggest that engaging in behavioral activation, such as meaningful work, could mitigate the risk of mental health diagnoses during pregnancy turning into postpartum mental health symptoms.

Limitations

The limitations of the study should be acknowledged. First, we relied on the self-reported experiences of mental health symptoms and history, which may be subject to recall bias. Second, the sample was predominantly White, highly educated, and well-resourced, limiting the generalizability of the findings to the broader population. Third, we used the principal component analysis with the items in the Epidemic-Pandemic Impacts Inventory scale to assess the dimensionality of behavioral activation during the pandemic. Despite our results showing acceptable internal consistency, further studies across diverse populations and contexts are warranted to establish comprehensively the psychometric properties. Furthermore, the work subscale of the behavioral activation measure consists of only two items. Although it is unlikely that work-related activities primarily drove overall behavioral activation, future research utilizing a more comprehensive assessment of work-related behavioral activation would further clarify the relative contribution of the work-related domain. Additionally, we did not collect information on the duration of mental health diagnoses, which could moderate the association between prenatal diagnoses and postpartum mental health symptoms.

Clinical Implications

Our findings suggest that mothers who received a diagnosis of depression or anxiety during pregnancy may see improvement in postpartum mental health symptoms when engaging in more behavioral activation during times of crisis. This has important clinical implications. Mental health diagnoses in pregnancy, in this sample and other research, are associated with mental health symptoms in the postpartum period (Badon et al., 2022; Khoury et al., 2021; Yan et al., 2022). As such, postpartum mental health support and secondary prevention should be seen as a key part of supporting women with mental health diagnoses in pregnancy, with an emphasis on strategies such as psychoeducation, early screenings, and treatment adherence (Park et al., 2020; Waqas et al., 2022). For

instance, encouraging more behavioral activation, such as finding meaning in daily activities or engaging in rewarding behaviors that promote a sense of purpose, may mitigate postpartum mental health symptoms in women with mental health diagnoses during pregnancy (Badon et al., 2022; Kolakowsky-Hayner et al., 2021). As a result, these strategies may enhance maternal psychological well-being and resilience during challenging times.

Conclusion

Our study highlights the protective role of behavioral activation during the COVID-19 pandemic in mitigating postpartum mental health symptomatology, particularly among mothers with depression or anxiety diagnoses during pregnancy. The findings highlight the importance of supportive prevention programs and resources in enhancing efforts focused on coping mechanisms, which are essential for improving maternal mental health, promoting well-being, and building resilience among mothers in times of crisis.

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