

Occupational Pregnancy Discrimination Is Associated With Negative Health Impacts for Pregnant Persons and Their Children

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Objective: The aim of the study is to examine associations between occupational pregnancy discrimination, maternal, and child health. **Methods:** A nationwide sample of individuals currently in their third trimester of pregnancy who worked full-time (>35 hr/wk) were recruited. Surveys were completed during the third trimester and 6 weeks postpartum. **Results:** Respondents ($N = 183$) were mostly White (57.9%), had at least a bachelor's degree (60.8%), and worked 40.3 hr/wk. Occupational pregnancy discrimination increased the odds of clinically significant depressive/anxiety symptoms by 8% and 17%, respectively (odds ratio = 1.1, 95% confidence interval: 1.0–1.1; odds ratio = 1.2, 95% confidence interval: 1.1–1.2). Discrimination was also associated with postpartum depression occurrence ($P = 0.02$). Social support level mitigated the association between pregnancy discrimination, depressive symptoms ($\beta = 2.1$, $P < 0.01$), and anxiety symptoms ($\beta = 7.25$, $P < 0.01$). **Conclusions:** Poorer mental health during and after pregnancy was associated with occupational pregnancy discrimination but effects were mitigated by social support.

Keywords: occupational health, pregnancy discrimination, mental health

Pregnancy is a critical period in the overall health of both the pregnant person and child. With maternal morbidity and mortality rates increasing in America and over double other high-income countries, elimination of harmful exposures during this time is crucial.¹ Of pregnant individuals in the United States, 56% are working full-time, with 82% of those individuals working within a month of the infant's due date.² Even with federal laws in place to protect those working while pregnant, pregnancy discrimination is still one of the top concerns of pregnant employees.² Discrimination is a known source of stress, which may negatively impact the health of the birthing person and child.^{3,4} With stress seen as an important determinant of health, furthering our understanding of how perceived pregnancy discrimination in the workplace impacts health outcomes is needed.

Pregnancy discrimination has been defined by Title VII of the Civil Rights Act of 1964 as unfair or negative treatment on the basis of pregnancy, childbirth, or related conditions. The number of new pregnancy discrimination charges received by the US Equal Employment

LEARNING OUTCOMES

- To assess the association between self-reported occupational pregnancy discrimination, anxiety symptoms, and depressive symptoms during pregnancy.
- To evaluate the association between self-reported occupational pregnancy discrimination and the occurrence of adverse pregnancy outcomes (e.g., gestational hypertension, preeclampsia, gestational diabetes, and diagnosis of postpartum depression, preterm birth).
- To accurately compare those with high versus low levels of support and assess whether social support is an effect modifier of the associations between occupational pregnancy discrimination, anxiety symptoms, and depressive symptoms.

Opportunity Commission has increased since 1997 to 2011 by 31%.⁵ There are limitations, however, to using this number to estimate the number of impacted individuals as not every pregnancy discrimination experience is reported and available surveillance data of pregnancy discrimination charges to the US Equal Employment Opportunity Commission ended in 2011.⁵ Although a handful of studies have been conducted to estimate the prevalence of pregnancy discrimination in the workplace, more research is needed. The Bipartisan Policy Center conducted a national survey of more than 2000 adults in February 2022, 21% of individuals who experienced pregnancy discrimination expressed fear of telling an employer about their pregnancy for this reason.⁶ With lack of emotional support from others (e.g., coworkers, supervisors) being associated with more psychological distressed, understanding how social support systems in place may influence impacts of occupational pregnancy discrimination is warranted.⁷

The deleterious impacts of other types of discrimination, such as racial discrimination, have been studied. From this work, racial discrimination has been associated with adverse birth outcomes including preterm labor and lower birth weights.³ Negative maternal health outcomes have also been observed, although less frequently studied. A recent systematic review assessing the relationship between racial discrimination and adverse pregnancy outcomes (e.g., hypertensive disorders of pregnancy, gestational diabetes, preterm birth, small for gestational age, etc.) only identified one study out of the 24 included to focus on adverse pregnancy outcomes affecting maternal health directly.^{8,9} In addition to the lack of focus on the relationship between discrimination and maternal health outcomes, even less is known about the impact of occupational pregnancy discrimination. Only one known study has assessed this relationship, finding that through an increase in stress that occupational pregnancy discrimination is associated with negative mental health outcomes such as an increase in depressive symptoms.¹⁰ This study, however, was limited in a lack of racial variability with the authors calling for more work to be conducted in a larger, more diverse sample, as some individuals may experience multiple types of discrimination because of their identities. Consequently, research is needed to address this gap in understanding concerning the impact various types of discrimination have on the health of pregnant individuals, including occupational pregnancy discrimination.

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The participants of this study did not give written consent for their data to be shared publicly, so because of the sensitive nature of the research, supporting data are not available.

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The purpose of this study was to assess the associations of perceived occupational pregnancy discrimination and the health of birthing persons and their children. It was hypothesized that higher levels of perceived pregnancy discrimination in the workplace would be associated with increased levels of depressive and anxiety symptoms, a greater occurrence of adverse pregnancy outcomes, and poorer newborn health. We also examined whether perceived social support modified the relationship between these outcomes. It was hypothesized that individuals who reported higher levels of social support and experienced pregnancy discrimination would experience less anxiety and depressive symptoms compared with those with lower reported social support.

METHODS

To address the proposed aims, a fully remote longitudinal cohort study design was implemented to assess perceived occupational pregnancy discrimination while concurrently assessing demographics, anxiety symptoms, depressive symptoms, and perceived social support. These factors were assessed in the third trimester of pregnancy via an online questionnaire administered using the Research Electronic Data Capture system REDCap (Version 13.10.4, Vanderbilt University, Nashville, TN).¹¹ Individuals were then followed up 6 weeks postpartum to assess maternal and neonatal health outcomes as well as actions taken to report pregnancy discrimination, if experienced.

Participants and Recruitment

A multi-pronged approach was used to recruit individuals to complete the online questionnaires including Facebook, Twitter, LinkedIn, and a mass email system through the university affiliated with our research group. Informed consent was obtained before collection of questionnaire responses. All study procedures and materials were approved by the University of Iowa Institutional Review Board.

Participants included in the study were in their third trimester of pregnancy, working full-time (at least 35 hour a week), employed in the United States, and were employed for at least 1 year at their current employer. Individuals were excluded if they had a previous diagnosis and/or treatment of depression or anxiety before conception. These exclusions were to control for anxiety and depression symptoms not related to the perinatal period.

Measures

Rigorous and validated measures assessing perceived pregnancy discrimination, depressive symptoms, postpartum depression, anxiety symptoms, maternal and neonatal health outcomes, and actions taken to report pregnancy discrimination were selected. The description of each measured is detailed hereinafter.

Demographics

Questions assessed characteristics of participants including age, race, ethnicity, gender identity, sexual orientation, marital status, education, annual household income, and parity. Questions contextualizing occupation included job title, days per week worked, and hours per day worked. Perceived ethnic and racial discrimination was assessed with the Brief Perceived Ethnic Discrimination Questionnaire–Community Version. Scale scores are calculated by summing responses to each item (scale: 0–5) with higher scores indicating a higher perception of racism. The Brief Perceived Ethnic Discrimination Questionnaire–Community Version has been validated in individuals older than 18 years and those who self-identify as Black, Latino(a), Asian, Alaskan Native, Pacific Islander, and Native American.¹²

Perceived Pregnancy Discrimination

A 10-item survey reflective of the instrument Hackney and colleagues¹⁰ used to assess current perceptions of occupational

pregnancy discrimination was administered. This survey was adapted from the validated Workplace Prejudice/Discrimination Inventory.¹³ Responses to the nine-item perceived occupational pregnancy discrimination survey were summed for a total score. Higher scores of perceived occupational pregnancy discrimination indicate greater perception of pregnancy discrimination. The survey was administered only in the first study contact during the third trimester of pregnancy.

Perinatal Depressive Symptoms

The Edinburgh Postnatal Depression Scale (EPDS) was used to assess depressive symptoms during both the first and follow-up study contacts (during the third trimester and 6 weeks postpartum, respectively). The EPDS is a 10-question depression screener that has been validated for use in pregnancy and postpartum periods (scale: 0–30 points).¹⁴ Questions assess depressive symptoms in the past 7 days, asking participants to assess how often certain feelings have occurred on a four-point Likert scale. Higher scores indicate more depressive symptoms experienced. Scores higher than 13 indicate higher risk for clinical depression. A single question concerning suicide was omitted from this assessment as done in other studies because of the inability to follow-up with individuals at risk for self-harm.¹⁵

Perinatal Anxiety Symptoms

The Perinatal Anxiety Screening Scale (PASS) was used to assess anxiety symptoms in our participants during their first study contact in the third trimester of pregnancy. This 31-item survey is validated to identify significant anxiety during the perinatal period (scale: 0–93).¹⁶ Items in this questionnaire assess how often in the past month individuals have experienced certain symptoms of anxiety on a four-point Likert scale. Higher scores indicate more anxiety symptoms experienced. Scores higher than 42 indicate severe anxiety symptoms.

Maternal and Neonatal Health Outcomes

Health outcomes for both the birthing persons and infant were assessed via a self-report questionnaire during their follow-up study contact (6 weeks postpartum). Maternal health outcomes were assessed with a yes or no question and included the occurrence of gestational hypertension, preeclampsia, gestational diabetes, and diagnosis of postpartum depression. To measure the occurrence of preterm birth and low birth weight, participants were asked to report gestational age at delivery and infant weight at delivery.

Perceived Social Support

The validated interpersonal Support Evaluation List Shortened Form (SEL-SF) was used to assess perceived social support.¹⁷ Questions asked individuals to rate on a four-point Likert scale from “definitely false” to “definitely true” various types of support they could experience (e.g., appraisal, belonging, and instrumental support). Each response on the four-point scale to the SEL-SF was summed for a total score. Scores were categorized as either low or high based on the median score.

Reporting of Pregnancy Discrimination

At follow-up (6 weeks postpartum), participants’ knowledge of who to report pregnancy discrimination to at their workplace, experiences with pregnancy discrimination, and if actions to report pregnancy discrimination were taken were assessed.

Statistical Analysis

Demographic characteristics were assessed with frequency for categorical variables and means for continuous variables, all of which were normally distributed. To assess the association between perceived pregnancy discrimination and depressive and anxiety symptoms (aim 1), multiple linear regression analysis assessed the associations between

TABLE 1. Baseline Demographic Characteristics of Survey Respondents (*N* = 187)

Participant Characteristics	
Age, mean ± SD	29.3 ± 3.3
Race, <i>n</i> (%)	
White	109 (58.3)
Black	70 (37.4)
Native American or Alaskan Native	7 (3.8)
Native Hawaiian or Pacific Islander	1 (0.5)
Hispanic, <i>n</i> (%)	
No	114 (61.0)
Yes	73 (39.0)
Marital status, <i>n</i> (%)	
Married or in a committed relationship	185 (98.1)
Single	2 (1.1)
Education, <i>n</i> (%)	
High school graduate or equivalent	70 (37.8)
Bachelor's degree	91 (49.2)
Master or doctoral degree	23 (12.3)
Did not report	3 (2.2)
Annual household income, <i>n</i> (%)	
<\$25,000	10 (5.5)
\$25,000–\$49,999	37 (20.2)
\$50,000–\$99,999	80 (43.7)
\$100,000–\$149,999	37 (20.2)
>\$150,000	19 (10.6)
Did not report	4 (2.7)
Parity, <i>n</i> (%)	
No children	143 (78.6)
1 child	31 (17.0)
2 children	8 (4.4)
Did not report	5 (3.2)
Average workdays/week, mean ± SD	5.1 ± 0.5
Average hours/week, mean ± SD	40.3 ± 6.0

perceived pregnancy discrimination with depressive symptom scores, and separately, anxiety symptom scores, adjusting for age, education, race, and perceived ethnic/racial discrimination. All assumptions with linear regression were verified and met before running the analysis.

To examine the effect perceived pregnancy discrimination has on maternal and neonatal health outcomes (aim 2), χ^2 and Fisher tests were used to examine the association between perceived pregnancy discrimination, gestational hypertension, preeclampsia, gestational diabetes, placental abruption, pregnancy loss, and postpartum depression. Logistic regressions were also conducted to assess relationships between occupational pregnancy discrimination and pregnancy health outcomes, controlling for age, education, race and perceived ethnic/racial discrimination.

To assess whether perceived social support modified the association between perceived pregnancy discrimination and depressive/anxiety symptoms (aim 3), multiple logistic and linear regression analysis were conducted as described in aims 1 and 2, with additional stratification by social support status (low vs high).

The overall prevalence of perinatal depression and perinatal anxiety in the literature is approximately 17% and 40%, respectively. Using outcomes from a prior study (cite), to power our study at 80% to detect a moderate effect size of 0.30 at the 0.05 significance level, we estimated that we would need a sample size of 67 individuals. To account for covariates, the necessary sample size was increased to 127 participants, estimating approximately 10 additional participants for each added covariate. We conservatively estimated that 60% of individuals recruited will complete both measures (during the third trimester and at 6 weeks postpartum), requiring a total sample size of 212 participants.

RESULTS

Participants

A total of 187 individuals completed all questionnaires at both time points (third trimester of pregnancy and 6 weeks postpartum) and their demographic characteristics are described in Table 1. Most respondents self-identified as White (58%), non-Hispanic (61%), in a committed relationship (98%), had at least a bachelor's degree (64%), had an annual household income of more than \$50,000 (75%), and had no children currently (79%). The average reported workdays per week was 5.1 days (5.1 ± 0.5) for a total of 40.3 hours per week (40.3 ± 6.0). The sensitivity analysis (Supplemental Table 1, <http://links.lww.com/JOM/B417>) comparing demographic characteristics of those who completed both time points versus only one time point indicated no significant differences between groups.

Perceived Occupational Pregnancy Discrimination and Mental Health

Frequency of responses and average score for each item assessed in the Perceived Occupational Pregnancy Discrimination Questionnaire can be found in Supplemental Table 2, <http://links.lww.com/JOM/B417>. Missing out on training, poor treatment, and having fewer opportunities had the highest mean score (2.18 ± 0.93 , 2.14 ± 1.16 , and 2.00 ± 1.06 , respectively), with an average score of 35 of 50 total points possible.

Described in Table 2 are the self-reported symptoms of depression and anxiety using the EPDS and PASS, respectively, and their association with self-reported perceived pregnancy discrimination in the workplace. The average score on the EPDS of study participants was 11.1 ± 4.7 , which is slightly below the clinically significant depressive

TABLE 2. Regression Models Assessing the Association of Perceived Pregnancy Discrimination and Depressive Symptoms and Anxiety Symptoms (*N* = 187)

	EPDS Total Score	PASS Total Score
Total score, mean ± SD	11.1 ± 4.7	35.9 ± 14.7
Clinically significant symptoms, <i>n</i> (%)	80 (42.6%)	62 (32.9%)
Logistic regression, OR and 95% CI	1.08 (1.0–1.1)	1.17 (1.1–1.2)
Depressive Symptoms	Linear Regression, β (SE)	Logistic Regression, OR (CL)
Age	−0.1 (0.1)	0.9 (0.8–1.0)
Education	0.4 (0.7)	1.4 (0.7–2.6)
Race	3.6 (0.7)	0.2 (0.1–0.4)
Perceived ethnic discrimination	0.2 (0.0)	1.1 (1.1–1.1)
Perceived pregnancy discrimination	0.1 (0.0)	1.1 (1.0–1.1)
Anxiety Symptoms	Linear Regression, β (SE)	Logistic Regression, OR (CL)
Age	−0.1 (0.3)	1.0 (0.9–1.1)
Education	0.5 (2.0)	1.2 (0.6–2.4)
Race	11.4 (2.0)	0.1 (0.1–0.3)
Perceived ethnic discrimination	0.5 (0.1)	1.1 (1.1–1.1)
Perceived pregnancy discrimination	0.9 (0.1)	1.2 (1.1–1.2)

All regression models control for age, education, race, and perceived ethnic discrimination. Any bolded values are significant variables in the model. Clinically significant symptom thresholds for depression and anxiety are a score of 13 on the EPDS and a score of 42 on the PASS. Significance is $P < 0.05$.

β , beta coefficient; CI, confidence interval; CL, confidence limits; EPDS, Edinburg Postpartum Depression Scale; OR, odds ratio; PASS, Perinatal Anxiety Screening Scale.

symptoms score threshold of 13. Nearly 43% ($n = 80$) of individuals had scores greater than or equal to the clinical threshold for depression on the EPDS scale (score > 13 on EPDS). Significant positive associations were detected between pregnancy discrimination and reporting clinically significant depressive symptoms while controlling for age, education, race, and perceived ethnic discrimination (odds ratio [OR] = 1.08, 95% confidence interval [CI]: 1.0–1.1). Indicating that individuals who experience pregnancy discrimination in the workplace are at 8% higher odds of reporting clinically significant depressive symptoms. Perceived ethnic/racial discrimination was also a significant covariate, with increases associated with 10% higher odds of clinically significant depressive symptoms. This significance held in the linear regression model that assessed perceived pregnancy discrimination and depressive symptoms ($\beta = 0.1$, $P < 0.001$), controlling for the same covariates.

The average score on the PASS was 35.6 ± 14.7 , with 62 (33%) individuals having scores indicating clinically significant anxiety symptoms (score > 42 on PASS). A significant positive association between pregnancy discrimination and reporting clinically significant anxiety symptoms on the PASS was observed, after controlling for age, education, race, and perceived ethnic discrimination (OR = 1.17, 1.1–1.2). Indicating that individuals who experience occupational pregnancy discrimination are at 17% higher odds of reporting clinically significant anxiety symptoms. Perceived ethnic/racial discrimination was also a significant covariate, with increases associated with 10% higher odds of clinically significant anxiety symptoms. This association remained significant in the linear regression model that assessed the association between perceived pregnancy discrimination and anxiety symptoms, controlling for the same covariates ($\beta = 0.9$, $P < 0.001$).

Perceived Occupational Pregnancy Discrimination and Pregnancy Health Outcomes

Of our study population, those who reported experiencing occupational pregnancy discrimination in the workplace saw nonsignificant greater frequency of all adverse pregnancy outcomes measured including gestational hypertension (12% vs 1%), preeclampsia (4% vs 1%), gestational diabetes (4% vs 2%), placental abruption (2% vs 0%), pregnancy loss (1% vs 0%), preterm birth (5% vs 2%), and postpartum depression (38% vs 3%). As seen in Table 3, postpartum depression ($P = 0.02$) was the only outcome significantly different between those who did and did not experience pregnancy discrimination.

Social Support as a Buffer for Perceived Occupational Pregnancy Discrimination

The median reported social support score was 16.3 (SD, 3.85) out of 48 on the SEL-SF. Those reporting lower than average (< 16.3) social support scored significantly higher (2.1 points, $P < 0.01$) on

the EPDS than those with higher-than-average social support (Fig. 1A). When comparing the two linear regression models stratified by reported support and controlling for all covariates, perceived pregnancy discrimination was more strongly associated with depressive symptoms for those with high social support ($\beta = 0.16$, $P < 0.01$) compared with those with low social support ($\beta = -0.06$, $P < 0.01$). Overall, those reporting low levels of social support maintained a higher level of reported depressive symptoms albeit reports of pregnancy discrimination. However, those reporting high levels of support also reported lower levels of depressive symptoms which increased with increasing reports of pregnancy discrimination. This suggests that discrimination only seems to be related to depressive symptoms among those with high social support.

Of those reporting lower than average social support, they scored significantly higher (7.3 points, $P < 0.01$) on the PASS than those with higher than average social support (Fig. 1B). When comparing the two linear regression models stratified by social support level and controlling for all covariates, perceived pregnancy discrimination was more strongly associated with anxiety symptoms for those with high social support ($\beta = 0.77$, $P < 0.01$) compared with those with low social support ($\beta = 0.46$, $P < 0.01$). Those with low levels of support also reported overall higher levels of anxiety symptoms, even with lower pregnancy discrimination scores.

DISCUSSION

The present study examined the association between perceived occupational pregnancy discrimination, depressive symptoms, anxiety symptoms, and adverse pregnancy outcomes. Results indicated that perceived occupational pregnancy discrimination was significantly positively associated with depressive and anxiety symptoms. There were also significant associations between perceived occupational pregnancy discrimination and the occurrence of postpartum depression and preterm birth. Notably, associations between pregnancy discrimination, depressive symptoms, and anxiety symptoms varied based on social support. Those indicating lower levels of social support saw overall higher levels of depressive and anxiety symptoms compared with those with higher levels of support.

Of the limited literature addressing the gap in understanding of perceived occupational pregnancy discrimination, results have indicated that these experiences are associated with adverse health effects for both the pregnant person and their child. The hypothesized pathway of relation was elucidated by Hackney et al¹⁰ in 2021, with results indicating that the indirect effect of perceived pregnancy discrimination on health (e.g., postpartum depressive symptoms) may occur through the pregnant person's reported level of stress. The findings of this group also reflect the results of the current study, reporting that perceived pregnancy discrimination was positively associated with postpartum depressive symptoms and negatively associated with gestational age, birth weight, and number of baby doctor visits attended.¹⁰

It is imperative to highlight that perceived ethnic discrimination was a significant covariate in all models assessing relationships between perceived pregnancy discrimination and mental health outcomes. Intersectionality, first defined by Kimberle Crenshaw in 1987, becomes important with discussion of this finding as it describes how intersecting systems of oppression may lead to additive deleterious effects on individual's health.¹⁸ In the context of pregnant working individuals, varying identities creates a complex interaction between individuals and their place of work. More specifically, when assessing the association between perceived pregnancy discrimination and depressive symptoms, perceived ethnic discrimination increases the odds of experiencing clinically significant symptoms by 10% (OR = 1.1, confidence limit: 1.1–1.1). Indicating that an individual may experience even greater odds of developing depression if they experience both ethnic discrimination and pregnancy discrimination in their workplace. Consequently, it is critical to recognize the role various forms of oppression

TABLE 3. Assessing Differences in Maternal and Neonatal Health Outcomes on Reports of Perceived Occupational Pregnancy Discrimination ($N = 187$)

Maternal Health Outcomes, n (%)	Total	Discrimination	No Discrimination	P
Gestational hypertension	22 (13.0%)	23 (12.4%)	1 (0.5%)	0.17
Preeclampsia	9 (4.8%)	7 (3.8%)	2 (1.1%)	0.21
Gestational diabetes	10 (5.4%)	7 (3.8%)	3 (1.6%)	0.08
Placental abruption	4 (2.2%)	4 (2.2%)	0 (0.0%)	0.44
Pregnancy loss	1 (0.5%)	1 (0.5%)	0 (0.0%)	0.70
Postpartum depression	75 (40.3%)	70 (37.6%)	5 (2.7%)	0.02
Preterm birth	14 (7.6%)	10 (5.4%)	4 (2.2%)	0.05

Self-reported incidence of Maternal Health Outcomes and Neonatal Health Outcomes. Bold P -values are < 0.05 significance level.

χ^2 and Fisher tests tested for statistical significance between maternal and neonatal health outcomes and report of pregnancy discrimination. Significance is $P < 0.05$.

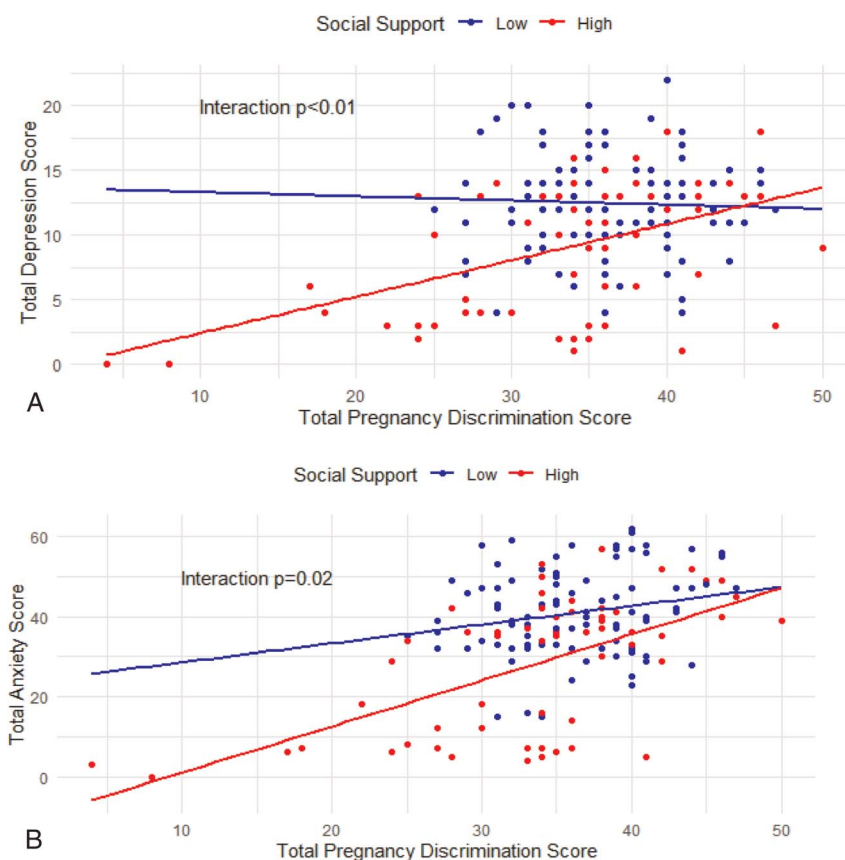


FIGURE 1. Associations of self-reported total occupational pregnancy discrimination and depression symptoms (A) and anxiety symptoms (B) were examined with multiple linear regression. All models adjusted for age, education, race, and perceived ethnic/racial discrimination. Interactions were examined for significance to assess whether social support was an effect modifier of these two models. Regression models of total occupational pregnancy discrimination and depression symptoms by social support level are displayed in panel A. Regression models of total occupational pregnancy discrimination and depression symptoms by social support level are displayed in panel B.

may have health and create solutions that dismantle each of these systems to truly achieve health equity for all pregnant employees.

When developing strategies to promote the health of pregnant employees, results indicate that consideration of the individual's perceived social support may be an important avenue to explore. Previously, studies have indicated that high social support have been associated with fewer mental health symptoms, reduced risk of preterm birth, and improved child development.¹⁹ This study supports these findings, with those who reported high levels of supported more likely to report less depressive and anxiety symptoms compared with those with low social support. Perceived social support is a modifiable factor, with the All Our Families longitudinal birth cohort study that saw 40% of individuals who began with low support at the start of pregnancy were able to improve their support over time.¹⁹ Promoting increases in social support for this population may be especially important after the occurrence of the COVID-19 pandemic. Research has indicated that the pandemic has significant negative impacts on social support, stress, and health behaviors (e.g., physical activity), highlighting a need to implement effective strategies to promote social support of perinatal individuals.²⁰

This study does feature various strengths. The population of this study was highly diverse with a range of races, ethnicities, education levels, and income levels represented. Retention of study participants in the study was also a strength, with approximately 75% of all consented individuals completing both surveys, reducing the likelihood of selection bias influencing results. With these strengths, there

are a few limitations to note. Self-reported measures were used for all measures, including the report of adverse pregnancy outcomes, which may potentially attribute to misclassification bias. In addition, assessment of perceived pregnancy discrimination occurred only in the third trimester. Future studies may consider assessing perceived pregnancy discrimination during each trimester of pregnancy to further understanding of temporal changes and better tailor strategies to reduce this exposure in the workplace. Finally, it is important to note that the possibility that those with more complicated pregnancy may have required more workplace accommodations, subsequently contributing to greater perceived pregnancy discrimination.

In conclusion, occupational pregnancy discrimination was associated with negative health outcomes for pregnant employees and their children. These association held even when adjusting for covariates such as perceived ethnic and racial discrimination. These results suggest fostering the cultivation of social support between employees may be an important strategy to promote health and well-being of pregnant employees during this critical period of change. Future studies should examine the direct effects of social support on pregnancy health and investigate intervention strategies to promote increases in support.

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REFERENCES

- Morrissey S, Blumenthal D, Osborn R, Curfman GD, Malina D. International health care systems. *New Engl J Med* 2015;372:75–76.
- ACOG Committee Opinion No. 733: employment considerations during pregnancy and the postpartum period. *Obstet Gynecol* 2018;131:E115–E123.
- Discrimination linked to increased stress, poorer health. Available at: <https://www.apa.org/news/press/releases/2016/03/impact-of-discrimination>. Accessed March 1, 2023.
- Woods SM, Melville JL, Guo Y, Fan MY, Gavin A. Psychosocial stress during pregnancy. *Am J Obstet Gynecol* 2010;202:61.e1–61.e7.
- U.S. Equal Employment Opportunity Commission. Pregnancy discrimination charges EEOC & FEPAs combined: FY 1997–FY 2011. Available at: <https://www.eeoc.gov/data/pregnancy-discrimination-chargeseeoc-fepas-combined-fy-1997-fy-2011>. Accessed March 1, 2023.
- Bipartisan Policy Center. BPC—Morning consult: 1 in 5 moms experience pregnancy discrimination in the workplace. Available at: <https://bipartisanpolicy.org/blog/bpc-morning-consult-pregnancy-discrimination/>. Accessed March 1, 2023.
- Ajrouch KJ, Reisine S, Lim S, Sohn W, Ismail A. Perceived everyday discrimination and psychological distress: does social support matter? *Ethn Health* 2010;15:417–434.
- Robin Van Daalen KR, Kaiser J, Kebede S, et al. Racial discrimination and adverse pregnancy outcomes: a systematic review and meta-analysis. *BMJ Glob Health* 2022;7:e009227.
- Grobman WA, Parker CB, Willinger M, et al. Racial disparities in adverse pregnancy outcomes and psychosocial stress. *Obstet Gynecol* 2018;131:328–335.
- Hackney KJ, Daniels SR, Paustian-Underdahl SC, Daniels SR, Eaton AA. Examining the effects of perceived pregnancy discrimination on mother and baby health. *J Appl Psychol* 2021;106:774–783. Available at: <https://web-s-ebscohost-com.proxy.lib.uiowa.edu/ehost/pdfviewer/pdfviewer?vid=0&sid=4ac7188d-003f-400e-8671-9560cba3c24e%40redis>. Accessed January 30, 2022.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research Electronic Data Capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009;42:377–381.
- Brondolo E, Kelly KP, Coakley V, et al. The Perceived Ethnic Discrimination Questionnaire: development and preliminary validation of a community Version1. *J Appl Soc Psychol* 2005;35:335–365.
- James K, Lovato C, Cropanzano R. Correlational and known-group comparison validation of a workplace prejudice/discrimination inventory. *J Appl Soc Psychol* 1994;24:1573–1592.
- Eberhard-Gran M, Eskild A, Tambs K, Opjordsmoen S, Samuelsen SO. Review of validation studies of the Edinburgh Postnatal Depression Scale. *Acta Psychiatr Scand* 2001;104:243–249.
- Whitaker KM, Jones MA, Dziewior J, et al. Feasibility, acceptability, and preliminary efficacy of a single-arm, remotely-delivered health coaching intervention to increase physical activity and reduce sedentary behavior during pregnancy. *BMC Pregnancy and Childbirth* 2022. doi:10.21203/rs.3.rs-1755320/v1.
- Somerville S, Dedman K, Hagan R, et al. The Perinatal Anxiety Screening Scale: development and preliminary validation. *Arch Womens Ment Health* 2014;17:443–454.
- Cohen S, Mermelstein R, Kamarck T, et al. Measuring the functional components of social support. *Social Support*. 1985:73–94.
- Grzanka PR. Intersectionality: foundations and frontiers. 2019. Available at: <https://philpapers.org/rec/GRZIFA-2>. Accessed April 2, 2023.
- Hetherington E, McDonald S, Williamson T, Tough S. Trajectories of social support in pregnancy and early postpartum: findings from the All Our Families cohort. *Soc Psychiatry Psychiatr Epidemiol* 2020;55:259–267.
- Matvienko-Sikar K, Pope J, Cremin A, et al. Differences in levels of stress, social support, health behaviours, and stress-reduction strategies for women pregnant before and during the COVID-19 pandemic, and based on phases of pandemic restrictions, in Ireland. *Women Birth* 2021;34:447–454.