Association Between Pre-pregnancy and Pregnancy Physical Abuse, Partner-related Stress, and Post-partum Depression: Findings from the Utah Pregnancy Risk Assessment and Monitoring System (UT-PRAMS), 2016-2018

Kebba Kah, Jennifer Dailey-Provost, Joseph B. Stanford, Charles R. Rogers, & Karen Schliep
/ University of Utah

Introduction

Negative consequences of post-partum depression (PPD) are significant, for both birthing parents and their offspring.[1-6] Morbidity and mortality associated with PPD are deserving of increased scrutiny overall and especially in Utah, the nation's youngest state (median age 30.5 years)[7] and fourth-most fertile state, with a fertility rate of 68.4 births per 1,000 women aged 15 through 44 years.[8] National prevalence of PPD among postpartum women is 12.5 percent[9]; in Utah, the PPD prevalence is 15.3 percent among mothers.

Several factors known to contribute to risk for PPD are pronounced in Utah.[10] The state ranks last in the nation for pay parity between men and women.[11] A growing body of research demonstrates that socioeconomic factors, including lack of pay parity, may collectively have multiplicative synergistic impact on adverse health outcomes, including depression and addiction.[12-15] Significantly, an estimated 36.9 percent of Utah women have been victims of domestic violence, compared to the national average of approximately 25 percent, and Utah is rated the 17th-worst state in the nation for domestic violence.[7]

The 2-fold purpose of this study was to examine (1) the association between physical abuse (pre-pregnancy and prenatal) and PPD and (2) the impact of stressful life events on the risk of PPD.[16,17] A better understanding of the predictors of PPD may be instrumental in designing and implementing interventions that have the potential to decrease the incidence of PPD and its adverse impacts.

Methods

Sample Description

This cross-sectional study[18] was conducted among women who participated in the Utah Pregnancy Risk Assessment Monitory System (UT-PRAMS) survey between January 1, 2016, and December 31, 2018, recalling pre-pregnancy, prenatal, and early postpartum events and exposures. PRAMS is a surveillance program of the US Centers for Disease Control and Prevention (CDC) that gathers data across the nation (most states and territories as well as tribal and local health departments) and provides geographic-specific data critical in accomplishing its primary goal of reducing infant mortality, which is a common worldwide measure of overall national health.[19] Since its inception in 1987, PRAMS has been utilized as a useful data source in ascertaining the changing risks and health outcomes associated with pregnancy for women and children. In addition to measuring pregnancy health, data is collected on socioeconomic status, life experiences, and quality of life, with the additional goals of mitigating risks and adverse health outcomes for women and children.

To address health risks and outcomes that are most pertinent to their unique populations, states and territories maintain a measure of control over stratifying data collection. UT-PRAMS oversamples women of lower education levels and infant birth weight to purposely capture data on a known high-risk population.[20] Approximately 200 women are contacted each month and asked to complete the survey. Those contacted are randomly selected within each stratum.

Primary Exposure, Physical Abuse

The primary exposure of interest was physical abuse experienced before and during pregnancy. Participants were asked the following questions: (1) "In the 12 months before you got pregnant with your new baby, did any of the following people push, hit, slap, kick, choke, or physically hurt you in any other way?", with options being "husband or partner," "ex-husband or ex-partner," and "someone else." Participants were instructed "for each person to check 'No' if they did not hurt you during this time or 'Yes' if they did." (2) A similar question was asked for the period of pregnancy, switching the first part of the question to "During your most recent pregnancy."

Secondary Exposure, Life Stress

The secondary exposure of interest for this study was life stress. The Phase 8 PRAMS questionnaire includes 13 questions regarding specific stressful events in the 12-month period prior to the birth of the child. The stressful events listed are (in order asked):

(1) A close family member was very sick and had to go into the hospital;
(2) I got separated or divorced from my husband or partner;
(3) I moved to a new address;
(4) I was homeless or had to sleep outside, in a car, or in a shelter;
(5) My husband or partner lost his job;
(6) I lost my job even though I wanted to go on working;
(7) My husband, partner, or I had a cut in work hours or pay;
(8) I was apart from my husband or partner due to military deployment or extended work related travel;
(9) I argued with my husband or partner more than usual;
(10) My husband or partner said he didn't want me to be pregnant;
(11) I had problems paying the rent, mortgage, or other bills;
(12) My husband, partner, or I went to jail;
(13) Someone very close to me had a problem with drinking or drugs;
(14) Someone very close to me died.

A dichotomous variable (yes/no) was used for each event, and the events were categorized into 1 of 4 groups: partner-related stress (questions 2, 7, 8, 9), traumatic stress (questions 4, 11, 12), financial stress (questions 5, 6, 7, 10) and emotional stress (question 1). Question 3 (move to new address) was not included in our analysis given that the outcome could be either a positive or negative experience.[21]

Primary Outcome: Postpartum Depression

The primary outcome measure of interest for this study was PPD, which was determined by having answered "always" or "often" to either of the following 2 UT-PRAMS questions that captured postpartum depressed mood and anhedonia: (1) "Since your new baby was born, how often have you felt down, depressed, or hopeless?", and (2) "Since your new baby was born, how often have you had little interest or little pleasure in doing things you usually enjoyed?"

Covariates

Covariates considered as potential confounding factors known to impact risk of abuse, life stress, and PPD included maternal age (continuous), race (White/non-White), ethnicity (Hispanic/non-Hispanic), marital status (married/not married), income level (≤$30,000, $30,000-$55,000, ≥$55,000), parity (continuous), history of preterm birth (yes/no), tobacco or alcohol consumption in past 2 years (yes/no), and depression before or during index pregnancy (yes/no). Lower educational attainment has also been shown to be more common among women who experience PPD,[22-24] and the differences between the overall population of Utah women and the study participants are shown in Figure 1. Accounting for some missing data, 58 individuals surveyed in this data sample were under the age of 18 years and too young to have achieved education levels measured here.

Statistical Analysis

Sociodemographic and health history characteristics among women with and without PPD were compared using the chi-square test for categorical and t test for continuous variables, considering the complex sampling design. To test the association between physical abuse, life stressors, and PPD, unadjusted and adjusted robust Poisson distribution models were used to estimate unadjusted and adjusted prevalence ratios (PR) and 95% confidence intervals (CI). Adjusted models considered maternal age, race/ethnicity, education, income, marital status, prior preterm births, parity, depression before and during pregnancy, and tobacco

or alcohol use in last 2 years. An additional adjustment for pre-pregnancy and prenatal partner-related, traumatic, financial, and emotional stress was done for the final model looking at physical abuse and PPD. Similarly, an additional adjustment for pre-pregnancy and prenatal physical abuse was done for the final model looking at stressful life events and PPD. Data analysis was generated using SAS software version 9.4 (SAS Institute, Inc., Cary, NC) and Stata Software 14.2 (StataCorp, LLC, College Station, TX).

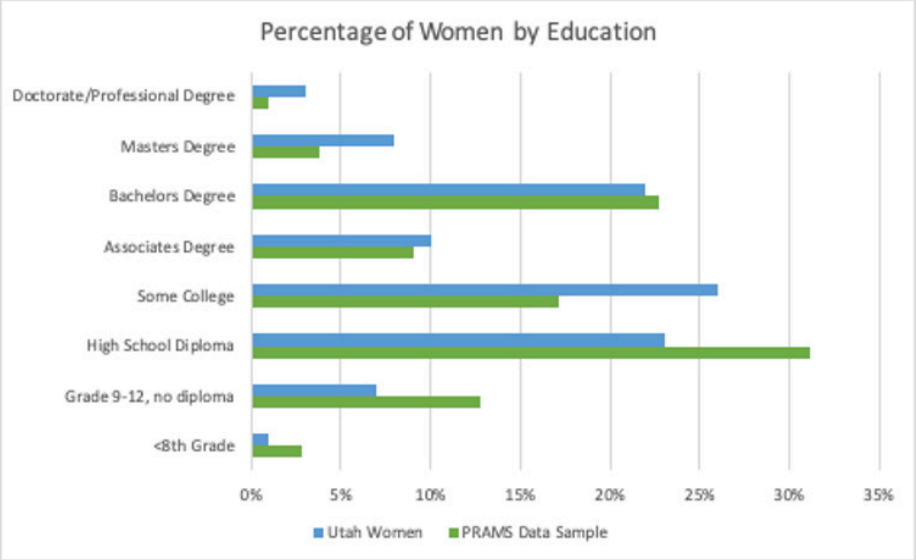

Figure 1: Percentage of total sample by degree attainment compared to overall Utah statistics regarding educational achievement, including trend lines.

Results

Sample Characteristics

A total of 4,101 women, representing 142,963 Utah women who delivered during that time frame, completed the UT-PRAMS survey between 2016 and 2018. Among the respondents, 72.7 percent were White, 15.0 percent White-Hispanic, 5.3 percent non-White–Hispanic, and 7.0 percent non-White, non-Hispanic. Over 77 percent of study subjects were married, 20.2 percent never married, and 2.3 percent divorced or widowed. The mean age was 28.4 years (range, 15-44 years), with approximately 22 percent living at very low income levels of $20,000 or less per year, and the highest education level of almost half of the participants (46.8%) was a high school diploma. While the World Population Review reports that nearly 37 percent of Utah women experience abuse in their lifetimes,[7] only 5 percent of respondents in this study reported pre-pregnancy and/or prenatal abuse. Women with PPD compared to women without PPD were inclined to be younger, unmarried,

Table 1: Characteristics of women in the UT-PRAMS survey 2016-2018 by postpartum depression (PPD) (n=4,101, representing population of 142,963 women)

Characteristics	PPD 16%	No PPD 84%
Age (in years) mean ± SE	27.9 ± 0.3	28.9 ± 0.1
Maternal race		
White	91%	91%
Non-White	9%	9%
Maternal ethnicity		
Hispanic	85%	84%
Non-Hispanic	15%	16%
Marital status		
Married	73%	84%
Not married	27%	16%
Education level		
<9th grade	1%	
9-12th grade	6%	2%
High school	19%	9%
Some college	22%	22%
Associate degree	12%	12%
College degree or above	39%	38%
Income level		
$0-$28,000	36%	25%
$28,001-$57,000	30%	30%
$57,001+	35%	44%
Parity (mean ± SE)	1.5 ± 0.1	1.4 ± 0.1
History of preterm birth	6%	5%
Smoke >1 cigarette in last 2 Y=years	19%	9%
Alcohol in last 2 years	41%	32%
Depression before pregnancy	35%	14%
Depression during pregnancy	43%	13%
Before or during pregnancy: any physical abuse	12%	3%
Partner-related life stress (12 months prior to birth)	42%	22%
Traumatic stress (12 months prior to birth)	24%	10%
Financial stress (12 months prior to birth)	57%	45%
Emotional stress (12 months prior to birth)	34%	27%

Descriptive characteristics of women in UT-PRAMS by PPD; with/without calculated by *t*-test or chi-square where applicable, with consideration of the stratified random sampling. n (%) unless otherwise noted.

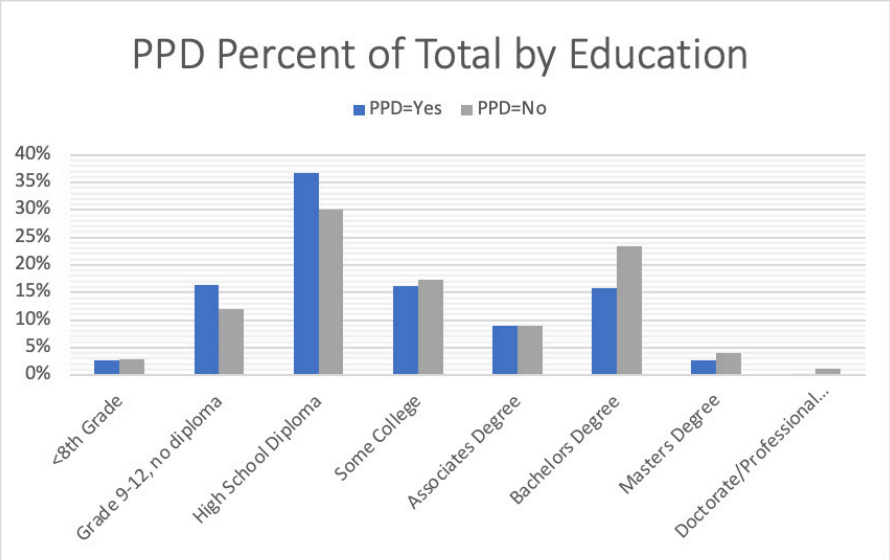

Figure 2: Educational attainment of study participants

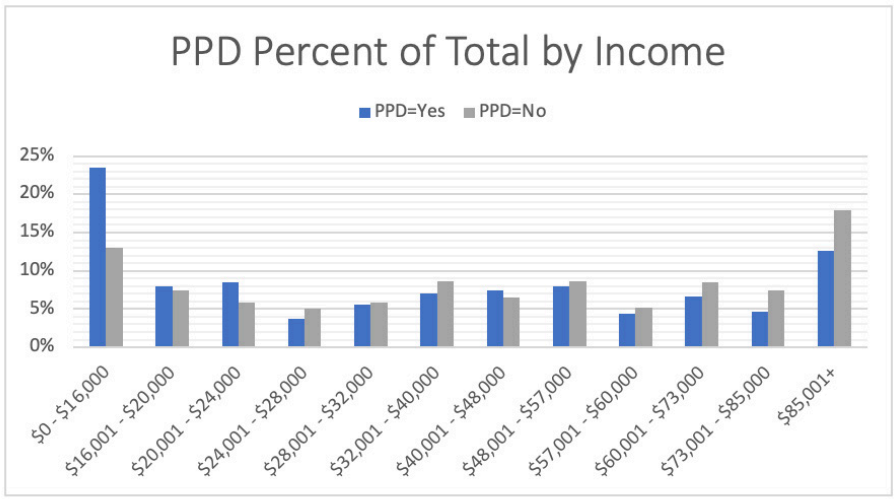

Figure 3: Income level of study participants

Table 2: Physical abuse and partner-related stress and association with postpartum depression

	Unadjusted RR PR (95% CI)	Model 1 aPR (95% CI)	Model 2 aPR (95% CI)
History of Physical Abuse			
Yes	3.06 (2.43, 3.85)	1.74 (1.32, 2.29)	1.56 (1.19, 2.07)
No	Reference	Reference	Reference
Partner-Related Stress			
Yes	2.12 (1.77, 2.53)	1.47 (1.20, 1.80)	1.32 (1.07, 1.65)
No	Reference	Reference	Reference
Traumatic Stress			
Yes	2.35 (1.93, 2.84)	1.42 (1.12, 1.79)	1.22 (0.94, 1.57)
No	Reference	Reference	Reference
Financial Stress			
Yes	1.53 (1.28, 1.84)	1.18 (0.97, 1.43)	1.09 (0.89, 1.34)
No	Reference	Reference	Reference
Emotional Stress			
Yes	1.29 (1.07, 1.56)	1.08 (0.88, 1.32)	1.04 (0.85, 1.28)
No	Reference	Reference	Reference

Model 1 adjusted for maternal age, race/ethnicity, education, income, marital status, prior preterm births, parity, depression before and during pregnancy, and smoking or alcohol in last two years.
Model 2 adjusted for Model 1 plus other abuse or stress-related factors listed in Table 2.

and more likely to consume alcohol, smoke, and have a history of depression and life stress (Table 1). They also leaned toward lower education and income levels (Figures 2 and 3).

Physical Abuse and Postpartum Depression

Four percent of women reported abuse, with 3 percent reporting abuse during pregnancy (1% by husband or partner, 1% by ex-husband or ex-partner, and 1% by someone else) and 4 percent reporting abuse before pregnancy (1% by husband or partner, 2% by ex-husband or ex-partner, and 1% by someone else). Twelve percent of women with any abuse prior to or during pregnancy experienced PPD compared to 3% of women who did not report abuse (Table 1). In the unadjusted analyses, women who experienced any physical abuse had a 3.06 higher PR (95% CI, 2.43, 3.85) of having PPD compared to women who did not (Table 2). After adjusting for maternal age, race/ethnicity, education, income, marital status, prior preterm births, parity, depression before and during pregnancy, and smoking or alcohol consumption in the last two years, the aPR was 1.74 (95% CI, 1.32, 2.29). Further adjustment for partner-related, traumatic, financial, and emotional stress did not appreciably alter findings (aPR 1.56; 95% CI, 1.19, 2.07) (Table 2).

Life Stressors and Postpartum Depression

Among the total sample, 25 percent of women reported partner-related stress (42% with PPD and 22% without PPD), 12 percent traumatic stress (24% with PPD and 10% without PPD), 47 percent financial stress (57% with PPD and 45% without PPD), and 28 percent emotional

stress (34% with PPD and 27% without PPD) (Table 1). In the unadjusted analyses, women who experienced any partner-related, traumatic, financial, or emotional stress had a 2.12 higher PR (95% CI, 1.77, 2.53), 2.35 higher PR (95% CI, 1.93, 2.84), 1.53 higher PR (95% CI, 1.28, 1.84), and 1.29 higher PR (95% CI: 1.07, 1.56) of having PPD, respectively, than women who did not (Table 2). Adjustment for potential confounders including other stressors and physical abuse attenuated the results. However, women who reported partner-related stress, compared to those who did not, still showed a 32 percent higher prevalence of PPD (95% CI, 7%-65%) (Table 2).

Discussion

Findings from this study revealed that women who were exposed to pre-pregnancy and prenatal abuse were at a 1.6 higher probability for PPD after considering numerous confounding factors such as life stressors in the year before birth. The results also suggested that exposure to life stressors, notably partner-related stress, is associated with a 1.3 higher probability of PPD after similar adjustment. Age, educational attainment, income, and marital status, among other elements, are known demographic factors that may reliably predict PPD risk. Screening of these demographic indicators in conjunction with careful exploration of exposure to partner-related abuse and experienced stress may provide opportunities for PPD prevention and mitigation interventions.

The findings from the UT-PRAMS data are validated by other studies in both low-income and high-income countries.[25-29] For example, a study by Desmaraids et al. conducted in Western Canada looking at intimate partner abuse before and during pregnancy showed that 84 percent with postpartum mental health problems reported abuse before pregnancy, and 70 percent experienced abuse during pregnancy.[30] Similarly, Tsai et al. employed secondary data analysis among women during pregnancy and postpartum in South Africa; the study reported a significant association between intimate partner violence and depression during pregnancy and postpartum.[31] Additionally, this study found both independent and adjusted significant associations between physical abuse and PPD. In a study conducted in France, Gaillard and colleagues corroborated these findings with physical abuse and depression during pregnancy having significant associations with PPD.[32] Although the present study utilized a cross-sectional study design, other studies using different methods arrived at similar findings and conclusions. Rogathi et al., in a prospective cohort study of postpartum depression among women who experienced intimate partner violence, showed that the odds of having postpartum depression increased by more than 3 times compared to women who did not.[33] Similar to the present study, younger women were inclined to develop more PPD than older women.[33]

The effects of physical abuse, coupled with other social health factors, can be long-lasting. A study of physical, sexual, and social health factors with associated trajectories of maternal depressive symptoms in pregnant women showed that 32.7 percent of women manifested subclinical depressive symptoms with 9 percent showing persistent symptoms of depression up to 4 years postpartum.[34]

The present study also found that partner-related stress, such as arguments, was a significant predictor of PPD. This is consistent with findings from other studies.[35] A Japanese study by Miura et al. revealed that verbal and physical abuse during pregnancy was significantly associated with PPD even after adjusting for potential confounders (OR=7.05, 95% CI, 2.23-10.55).[35] The findings from Muira and colleagues are important for this present study because similar questions and responses were used in determining the occurrence of physical abuse. These similar results established the co-existence of physical and verbal abuse from intimate partners. Thus, establishing the history of exposure to physical violence and verbal abuse serves as an important measure in determining association. In a study conducted in Ohio, Das et al. concluded that a documented history of exposure to depression during pregnancy is significant in identifying mothers who are at higher risk of anxiety and stress. Furthermore, stressful life events determined by using the Life Events Questionnaire (LEQ) to measure the degree of life stress have been found to be significantly associated with the prevalence of PPD.27 Thus, these factors should be screened in combination with depression.[36]

Limitations

Our study has limitations. First, the outcome of

interest, PPD, lacks an official medical diagnosis and is dependent on participant responses to survey data. While screening questions mimic validated clinical screening tools,[37] they may not always correctly classify the actual condition of PPD. Second, an important demographic factor for which this data set differs from the overall Utah population is race and ethnicity. The dataset contains the following racial breakdown: 72.7 percent White, 6.9 percent non-White, non-Hispanic, and 20.3 percent Hispanic (higher than the national average). Thus, findings from this study will be generalizable for White and, to some extent, Hispanic women but no other minority groups prevalent in Utah.

Conclusion

It may be of value to explore the relative impact of specific factors associated with adverse outcomes, as this data may help inform decisions about use of finite resources in mitigating and preventing harm. Our study found that exposure to abuse before and during pregnancy, in addition to partner-related stress, were significant predictors of PPD. Further examination may be warranted to explore the interplay between partner-related physical abuse, life stressors, and perceived stress on risk of PPD, as women may suffer similar negative life events but appraise the impact or severity differently.

Acknowledgements

Data were provided by the Utah Pregnancy Risk Assessment Monitoring System, a project of the Utah Department of Health (UDOH), the Office of Vital Records and Health Statistics of the UDOH, and the Centers for Disease Control and Prevention (CDC) of the United States Department of Health and Human Services. The authors extend appreciation to the participants who made the study possible. This report does not represent the official views of the UDOH or CDC.

Funding

Dr. Karen Schliep was supported by a NIH National Institute of Aging (NIA) grant, "Hypertensive Disorders of Pregnancy and Subsequent Risk of Vascular Dementia, Alzheimer's Disease, or Related Dementia: A Retrospective Cohort Study Taking into Account Mid-Life Mediating Factors" (K01AG058781). Dr. Charles R. Rogers was financially supported by 5 For the Fight, the University of Utah Huntsman Cancer Institute, the V Foundation for Cancer Research, and a NIH National Cancer Institute (NCI) grant (K01CA234319). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH, 5 For the Fight, V Foundation for Cancer Research, Huntsman Cancer Institute, or the University of Utah.

References

1. Li Y, Long Z, Cao D, Cao F. Maternal history of child maltreatment and maternal depression risk in the perinatal period: A longitudinal study. Child Abuse Neglect. 2017;63:192-201. doi:10.1016/j.chiabu.2016.12.001

2. Lara-Cinisomo S, Zhu K, Fei K, Bu Y, Weston AP, Ravat U. Traumatic events: exploring associations with maternal depression, infant bonding, and oxytocin in Latina mothers. BMC Women's Health. 2018;18:31. doi:10.1186/s12905-018-0520-5

3. Slomian J, Honvo G, Emonts P, Reginster J-Y, Bruyère O. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. Women's health (London, England). 2019;15:1745506519844044. doi:10.1177/1745506519844044

4. Swartz HA, Cyranowski JM, Cheng Y, Amole M. Moderators and mediators of a maternal depression treatment study: Impact of maternal trauma and parenting on child outcomes. Comprehensive Psychiatry. 2018;86:123-130. doi:10.1016/j.comppsych.2018.08.001

5. Tambelli R, Trentini C, Trovato A, Volpi B. Role of psychosocial risk factors in predicting maternal and paternal depressive symptomatology during pregnancy. Infant Ment Health J. 2019 Jul;40:541-556. doi: 10.1002/imhj.21791.

6. Yu H, Jiang X, Bao W, Xu G, Yang R, Shen M. Association of intimate partner violence during pregnancy, prenatal depression, and adverse birth outcomes in Wuhan, China. BMC Pregnancy Childbirth. 2018;18:469. doi:10.1186/s12884-018-2113-6

7. World Population Review. Domestic violence by state. https://worldpopulationreview.com/state-rankings/domestic-violence-by-state. Published 2020. Accessed July 8, 2020.

8. Centers for Disease Control and Prevention. Fertility rate by state. National Center for Health Statistics. https://www.cdc.gov/nchs/pressroom/sosmap/fertility_rate/fertility_rates.htm. Published 2020. Accessed July 9, 2020.

9. Foundation UH. America's health rankings. https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/postpartum_depression/state/UT. Published 2020. Accessed July 25, 2020.

10. Ogbo FA, Eastwood J, Hendry A, et al. Determinants of antenatal depression and postnatal depression in Australia. BMC Psychiatry. 2018;18:49. doi:10.1186/s12888-018-1598-x

11. Davidson L. Utah now has America's biggest gender wage gap - women earn 70 cents on the dollar compared to men. Salt Lake Tribune. https://www.sltrib.com/news/politics/2018/04/10/utah-now-has-americas-biggest-gender-wage-gap-women-earn-70-cents-on-the-dollar-compared-to-men/. Published 2018. Accessed July 9, 2020.

12. Assari S. Social determinants of depression: The Intersections of race, gender, and socioeconomic status. Brain Sciences. 2017;7doi:10.3390/brainsci7120156

13. Fornili K. The opioid crisis, suicides, and related conditions: Multiple clustered syndemics, not singular epidemics. Journal of Addictions Nurs. 2018;29:214-220. doi:10.1097/JAN.0000000000000240

14. Singer M. Introduction to syndemics: A critical systems approach to public and community health. John Wiley & Sons. 2009;

15. Singer M, Bulled N, Ostrach B, Mendenhall E. Syndemics and the biosocial conception of health. Lancet (London, England). 2017;389:941-950. doi:10.1016/S0140-6736(17)30003-X

16. Riggs DS, Caulfield MB, Street AE. Risk for domestic violence: factors associated with perpetration and victimization. Clinical Psychol. 2000;56:1289-1316. doi:10.1002/1097-4679(200010)56:10<1289::AID-JCLP4>3.0.CO;2-Z

17. Silveira MF, Mesenburg MA, Bertoldi AD, et al. The association between disrespect and abuse of women during childbirth and postpartum depression: Findings from the 2015 Pelotas birth cohort study. Affect Disord. 2019;256:441-447. doi:10.1016/j.jad.2019.06.016

18. Mann CJ. Observational research methods. Research design II: cohort, cross sectional, and case-control studies. Emerg Med. 2003;20:54-60. doi:10.1136/emj.20.1.54

19. Shulman HB, D'Angelo DV, Harrison L, Smith RA, Warner L. The Pregnancy Risk Assessment Monitoring System (PRAMS): Overview of design and methodology. Am Public Health. 2018;108:1305-1313. doi:10.2105/AJPH.2018.304563

20. Schliep KC, Denhalter D, Gren LH, Panushka KA, Singh TP, Varner MW. Factors in the hospital experience associated with postpartum breastfeeding success. Breastfeed Med. 2019;14:334-341. doi:10.1089/bfm.2018.0039

21. Morgan N, Christensen K, Skedros G, Kim S, Schliep K. Life stressors, hypertensive disorders of pregnancy, and preterm birth. J Psychosom Obstet Gynaecol. 2020:1-9. doi:10.1080/0167482X.2020.1778666

22. Chetty R, Stepner M, Abraham S, et al. Evidence for causal links between education and maternal and child health: Systematic review. Med Int Health. 2019;24:1750-1766. doi:10.1111/tmi.13218

23. Ghaedrahmati M, Kazemi A, Kheirabadi G, Ebrahimi A, Bahrami M. Postpartum depression risk factors: A narrative review. Educ Health Promot. 2017;6:60. doi:10.4103/jehp.jehp_9_16

24. Smorti M, Ponti L, Pancetti F. A comprehensive analysis of post-partum depression risk factors: The role of socio-demographic, individual, relational, and delivery characteristics. Front Public Health. 2019;7:295. doi:10.3389/fpubh.2019.00295

25. Alharbi AA, Abdulghani HM. Risk factors associated with postpartum depression in the Saudi population. Neuropsychiatr Dis Treat. 2014;10:311.

26. Norhayati M, Hazlina NN, Asrenee A, Emilin WW. Magnitude and risk factors for postpartum symptoms: A literature review. J Affect Disord. 2015;175:34-52.

27. Nurbaeti I, Deoisres W, Hengudomsub P. Association between psychosocial factors and postpartum depression in South Jakarta, Indonesia. BMJ Sex Reprod Health. 2019;20:72-76.

28. Roelens K, Verstraelen H, Van Egmond K, Temmerman M. Disclosure and health-seeking behaviour following intimate partner violence before and during pregnancy in Flanders, Belgium: a survey surveillance study. Eur J of Obstet Gynecol Reprod Biol. 2008;137(1):37-42.

29. Sørbø MF, Grimstad H, Bjørngaard JH, Lukasse M, Schei B. Adult physical, sexual, and emotional abuse and postpartum depression, a population based, prospective study of 53,065 women in the Norwegian Mother and Child Cohort Study. BMC Pregnancy Childbirth. 2014;14(1):1-9.

30. Desmarais SL, Pritchard A, Lowder EM, Janssen PA. Intimate partner abuse before and during pregnancy as risk factors for postpartum mental health problems. BMC Pregnancy Childbirth. 2014;14(1):1-12.

31. Tsai AC, Tomlinson M, Comulada WS, Rotheram-Borus MJ. Intimate partner violence and depression symptom severity among South African women during pregnancy and postpartum: Population-based prospective cohort study. PLoS Med. 2016;13(1):e1001943

32. Adeline Gaillard YLS, Laurent Mandelbrot, Hawa Keita, Caroline Dubertret. Predictors of postpartum depression: Prospective study of 264 women followed during pregnancy and postpartum. Psychiatry Res. 2014;215:341-6.

33. Rogathi JJ, Manongi R, Mushi D, et al. Postpartum depression among women who have experienced intimate partner violence: A prospective cohort study at Moshi, Tanzania. J Affect Disord. 2017;218:238-245.

34. Giallo R, Pilkington P, McDonald E, Gartland D, Woolhouse H, Brown S. Physical, sexual and social health factors associated with the trajectories of maternal depressive symptoms from pregnancy to 4 years postpartum. Soc Psychiatry Psychiatr Epidemiol. 2017;52(7):815-828.

35. Miura A, Fujiwara T. Intimate partner violence during pregnancy and postpartum depression in Japan: A cross-sectional study. Front Public Health. 2017;5:81.

36. Das A, Gordon-Ocejo G, Kumar M, Kumar N, Needlman R. Association of the previous history of maternal depression with post-partum depression, anxiety, and stress in the neonatal intensive care unit. J Matern-Fetal Neonatal Med. 2021;34(11):1741-1746.

37. Gjerdingen DK, Yawn BP. Postpartum depression screening: Importance, methods, barriers, and recommendations for practice. J Am Board Fam Med. 2007;20:280 - 288. doi:10.3122/jabfm.2007.03.060171