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Short Communication

Pregnant women in treatment for opioid use disorder: Material hardships and psychosocial factors

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HIGHLIGHTS

- Study designed to evaluate psychosocial complexities within this pregnant population
- These women in substance abuse treatment report food (56%), housing (61%) hardships.
- Food/housing hardships associated with depression, intimate partner vulnerability.
- Psychosocial factors complicate substance abuse recovery and maternal-child health.
- Substance abuse treatment should include psychosocial screening/remediation.

ARTICLE INFO

Keywords:

Food insecurity
Housing instability
Opioid use disorder treatment
Material hardships
Maternal-child health

ABSTRACT

Background: While pregnant women in treatment for opioid use disorder (OUD) face considerable challenges, common material hardships— food insecurity and housing instability, known to negatively impact maternal-child health, have been inadequately researched within this population. This study describes food/housing hardships and evaluates associations with key psychosocial factors.

Methods: A single-site prospective study, 100 3rd trimester women receiving prenatal care and medication-assisted treatment for OUD were interviewed, including screening for food/housing hardships, depressive symptoms, intimate partner vulnerability; and self-reported post-traumatic stress disorder (PTSD) history. We developed a three-level categorization combining food/housing screening outcomes: 1) “both insecure”; 2) “either insecure”; and 3) “both secure”. Bivariate analyses and linear path analyses evaluated associations among psychosocial variables using “both secure” as the referent group.

Results: Of 100 women, 56% reported food insecurity; 61% housing instability; 42% “both insecure”; 33% “either insecure”; 25% “both secure”. In unadjusted food/housing groups “either insecure” and “both insecure” reported significantly greater depressive symptoms; “both insecure” additionally reported significantly greater intimate partner vulnerability. Path analyses adjusted for PTSD and compared with “both secure” (adjusted mean = 6.2): “either insecure” had greater depressive symptom scores (adjusted means = 9.8, $p = .01$) while “both insecure” had greater depressive scores (adjusted means 10.5, $p = .002$). In addition, “both insecure” had a clinically important 5.7 point greater intimate partner vulnerability score. There were no significant interactions between food/housing and PTSD.

Conclusions: Even in women receiving prenatal care and treatment for OUD, food/housing material hardships and associated psychosocial factors are of major concern, requiring screening and remediation.

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<https://doi.org/10.1016/j.addbeh.2019.106030>

Received 13 February 2019; Received in revised form 28 May 2019

Available online 20 June 2019

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1. Introduction

Opioid use among US pregnant women (1999–2014) rose from 1.5 to 6.5/1000 hospital births annually (Haight, Ko, Tong, Bohm, & Callaghan, 2018), many living in poverty and experiencing negative psychosocial issues complicating health and substance use disorder interventions (Tuten, Jones, & Svikis, 2003; U.S. Department of Health & Human Services, 2017).

Food insecurity (inability to afford enough food for an active/healthy life) and housing instability (inability to pay rent/mortgage; temporarily living with others due to financial difficulties; or homelessness), are often co-occurring, unobvious, remediable material hardships (Frank et al., 2010). Food insecurity in pregnant women, often associated with inadequate nutrition may result in under- or overweight, either negatively affecting maternal/child health (Ivers & Cullen, 2011). Prenatal housing instability is associated with a range of adverse neonatal risks, especially low birth weight, a negative marker of child health (Carrion et al., 2015; Sandel et al., 2018). In other populations, frequent moves have been associated with difficulties in medical care continuity and public assistance program access (Pavao, Alvarez, Baumrind, Induni, & Kimerling, 2007). Additionally, financial and time-related priorities for food and housing access may overshadow attention to medical needs (Kalichman et al., 2014; Kushel, Gupta, Gee, & Haas, 2006), particularly detrimental for pregnant women in treatment for OUD. Other studies identified associations of material hardships with contextual psychosocial factors including maternal depression, intimate partner violence (IPV), history of post-traumatic stress disorder, and even learning disabilities (Suglia, Duarte, & Sandel, 2011; Weiser et al., 2011; Chilton & Booth, 2007; Daoud et al., 2016; Rollins et al., 2012; Laraia, Siega-Riz, Gundersen, & Dole, 2006; Kalil, Seefeldt, & Wang, 2002).

To our knowledge, the simultaneous prevalence and associations of food/housing hardships and psychosocial stressors have not been quantified in a sample of pregnant women in treatment for OUD and receiving prenatal care. This study aims to identify prevalences of food insecurity/housing instability and interrelationships among key psychosocial factors in a sample of pregnant women receiving prenatal care and treatment for OUD, to promote systematic food/housing screening and remediation within standards of clinical care and practice.

2. Materials and methods

2.1. Design and sample

Boston University Medical Campus Institutional Review Board approved this single-site prospective cohort design study. We approached (June 2013–September 2015) 3rd trimester women receiving care in a specialized combined obstetric care and medication-assisted treatment (methadone or buprenorphine) clinic for women with OUD at Boston Medical Center, a large urban safety-net hospital. Recruited women were: ≥ 18 years; English-fluent; deemed capable by a clinician to provide informed consent; intending on delivering at the hospital, remaining in the Boston area, and maintaining parental custody. Following informed consent, a research assistant conducted a face-to-face interview, the basis for current analyses. After interview completion, participants were given a \$100 local store gift card in partial compensation for their time.

2.2. Interview

Interview included demographic information, food/housing material hardships screening, and other psychosocial variables including depressive symptoms, perceptions of intimate partner violence (IPV) susceptibility, and history of PTSD and learning disabilities. A validated 2-question the Hunger Vital Sign™ screener identified past 6 month food

insecurity if ≥ 1 questions were endorsed (Hager et al., 2010). Past 6 months housing instability was identified if ≥ 1 of the following were endorsed: inability to pay rent/mortgage; temporarily living with others due to financial difficulties; homeless (Cutts et al., 2011).

The Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987), a validated 10-item, 4-point Likert screener used with pregnant/postpartum women, indicated past week depressive-related symptoms. Women's Experience with Battering Scale (WEB) (Smith, Earp, & DeVellis, 1995), a 10-question, 6-point Likert scale, screened for perceptions of physical and psychological danger with a current partner (related to IPV). Higher EPDS and WEB scores indicate greater severity of depression and IPV, respectively. When prevalent during pregnancy, IPV has been associated with material hardships and/or a substance-using environment (Coker, Smith, McKeown, & King, 2000; El-Bassel, Gilbert, Wu, Go, & Hill, 2005). The interview included two individual questions asking history of PTSD or learning disabilities diagnoses.

2.3. Statistical analysis

Because previous research reported cumulative negative effects of material hardships on maternal/child health/well-being in low-income samples (Frank et al., 2010), and preliminary analyses identified significant co-occurrence of food/housing hardships, we developed a three-level predictor variable combining food/housing screening outcomes to generate descriptive statistics. Women endorsing 1) both food and housing hardships were categorized as “both insecure”; 2) either food or housing hardships as “either secure”; or 3) neither food nor housing hardships as “both secure”.

Bivariate analyses (one-way analysis-of-variance with post hoc Tukey or chi-square testing), evaluated contextual demographic and psychosocial characteristics of interest. Using linear model analyses examining potential mediation by WEB with EPDS as outcomes, and both variables as multiple outcomes (without mediation), we computed a series of path models. The best model [lowest Akaike information criterion (AIC) value] included: food/housing hardships and history of PTSD as exogenous (independent) variables; and the WEB and EPDS as endogenous (dependent/outcome) variables without mediation. To understand confounding effects of history of PTSD on food/housing hardship associations with WEB and EPDS, bivariate (unadjusted) analyses results were compared and contrasted to results from the path model adjusted for history of PTSD. We used SAS version 9.3 and Mplus version 7.3.1 with two-sided alpha of $p < .05$.

3. Results

Of 223 eligible women, 62 (28%) delivered before initially approached; 12 (5%) were ineligible to provide consent; 49 (33%) declined participation or did not complete interview.

Across the primarily White, non-Hispanic, high school-educated, public health-insured sample of 100, 56% reported past 6 months food insecurity; 61% housing instability. Table 1 shows bivariate demographics with 42% categorized as food and housing “both insecure”, 33% “either insecure”, and 25% “both secure”. In bivariate analyses, age, race/ethnicity, relationship status, education, insurance, self-reported learning disabilities, first opioid use prior to age 18, or variables associated with current/past treatment for substance use did not significantly nor substantially differ across groups. Groups did not significantly differ by history of PTSD, and current EPDS and WEB screenings. In unadjusted contrasts (“both secure”, the referent group), the “both insecure” group had significantly higher WEB scores by 7.4 points (mean = 21.3 vs. “both secure”, mean = 13.9, $p = .02$) and EPDS scores by 4.6 points (mean = 10.6 vs. “both secure”, mean = 6.0, $p = .0008$). The “either insecure” group had higher EPDS by 3.9 points (mean = 9.9, $p = .006$). A path model (Fig. 1) controlling for PTSD diagnosis treated WEB and EPDS as multiple outcomes (“both secure”

Table 1
Participant demographic and psychosocial characteristics, 2013–2015.

	All (N = 100)	Food insecure/ housing unstable (both insecure) (n = 42)	Food insecure or housing unstable (either insecure) (n = 33)	Food secure and housing stable (both secure) (n = 25)	p-Value
Demographic characteristics					
Maternal age, mean (SD)	28.6 (5.1)	29.3 (4.8)	27.9 (6.0)	28.4 (4.3)	0.48
White/Non-Hispanic race/ethnicity, no. (%)	73 (73.0)	32 (76.2)	26 (78.8)	15 (60.0)	0.23
In a relationship, no. (%)	81 (81.0)	32 (76.2)	27 (81.8)	22 (88.0)	0.49
≥ High school education, no. (%)	83 (83.0)	36 (85.7)	26 (78.8)	21 (84.0)	0.72
Learning disabilities identified prior to adulthood no. (%),	21 (21.0)	10 (23.8)	8 (24.2)	3 (12.0)	0.44
First use of opioids prior to age 18, no. (%)	32 (32.3)	14 (33.3)	13 (39.4)	5 (20.8)	0.33
Public health insurance receipt, no. (%)	93 (93.0)	38 (90.5)	32 (97.0)	23 (92.0)	0.61
Current opioid agonist treatment, no. (%) ^a methadone	54 (54.0)	25 (59.5)	16 (48.5)	13 (52.0)	0.62
Previous diagnosis of Post-Traumatic Stress Disorder, no. (%)	56 (56.0)	28 (66.7)	21 (63.6)	7 (28.0)	< 0.01
Previous receipt of outpatient detoxification programs, no. (%)	31 (59.6)	15 (68.2)	12 (66.7)	4 (33.3)	0.11
Previous receipt of residential treatment programs, no. (%)	76 (76.0)	31 (73.8)	28 (84.8)	17 (68.0)	0.30
Current Screening using the Edinburgh Post-Natal Depression Scale and Women's Experience with Battering Scale					
Edinburgh Post-Natal Depression Scale (EPDS) Score, mean (SD)	9.2 (5.5)	10.6 (6.0)	9.9 (4.5)	6.0 (4.8)	< 0.01
Women's Experience with Battering Scale (WEB) Score, mean (SD)	17.3 (12.6)	21.3 (14.7)	14.7 (10.3)	13.9 (9.9)	0.02

The bold p values indicated statistical significance at > 0.05

^a Remainder of the sample received buprenorphine as the opioid agonist treatment.

the referent group). The “either insecure” group had higher EPDS scores by 3.6 points (adjusted mean = 9.8 vs. “both secure”, adjusted mean = 6.2, $p = .01$) while the “both insecure” group had higher EPDS scores by 4.3 points (adjusted mean = 10.5, $p = .002$). While “either insecure” was not significantly associated with WEB scores, “both insecure” had a 5.7 point higher mean score on the WEB compared to “both secure”, a clinically important but not statistically significant difference. When comparing model results controlling for history of PTSD to the unadjusted differences in WEB and EPDS (Table 1), differences in outcome between food/housing hardship categories were somewhat attenuated from confounding by PTSD. There were no significant interactions between food and housing status and history of PTSD. WEB and EPDS were correlated ($r = 0.33$, $p = .006$).

4. Discussion

This study of a growing, under-studied population is unique as it presents prevalences and associations of food insecurity/housing instability and other psychosocial factors, each known to negatively influence maternal/child health, yet not usually simultaneously studied

within a sample of pregnant women receiving OUD treatment and prenatal care. By identifying food/housing hardships within this sample, this study importantly: 1) quantifies food insecurity/housing instability, both of which are remediable aspects of social determinants of negative health outcomes; and 2) simultaneously identifies inter-relationships among psychosocial factors (IPV, depression, history of PTSD) within the multi-stressor life-context of this socially and medically vulnerable sample.

Notably, food and housing hardship prevalences within this sample were markedly greater (food: 56% versus 34%; housing: 61% versus 40%) than a general sample of primarily public health-insured mothers of young children interviewed at the same hospital between 2013 and 2015 (Children's HealthWatch data, S. Ettinger DeCuba written communication, June 2017).

As expected, food/housing material hardships in this study were each associated with depression (King, 2018). In our path model, food insecurity AND housing instability but not food insecurity OR housing instability was significantly associated with IPV. This may indicate that for women experiencing both food and housing material hardships (and probably others), the context of IPV may play a significant role in the

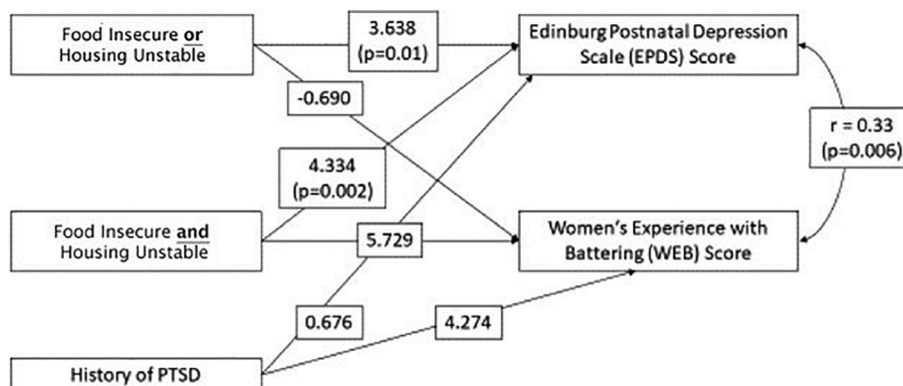


Fig. 1. Path model of best fit via AIC (N = 100) controlling for history of PTSD and treating WEB and EPDS as multivariate outcomes.

association of those hardships, different from women experiencing either hardship. This finding has implications for remediation of material hardships and deserves further research with larger samples. Women who are housed, food secure, and physically/emotionally safe are more likely to be invested in their own healthcare and interventions (Damian, Mendelson, & Agus, 2017; Gopman, 2014) and their children's well-being (Hans, 2002).

As an unexpected study byproduct, 21% of our sample [versus 2.7% of the general population of adults living in poverty (Cortiella & Horowitz, 2014)] self-reported childhood learning disabilities, an important contextual condition different from educational attainment, and not usually measured in this population. Learning disabilities, which may impact literacy, social skills, job attainment, and effective adult domain navigation, may have significant ramifications for interventions associated with food/housing hardships and treatment for substance use disorders (Cortiella & Horowitz, 2014). Clinicians providing treatment for OUD and maternal-child services need to be aware of diverse learning abilities, and the possible need for less complex and fewer step instructions, increased clarity of written materials, and/or additional referral and coaching supports.

4.1. Clinical implications

Prenatal care and interventions for substance misuse should routinely include screening paired with referrals and/or interventions for basic food/housing needs, mental health, and IPV services. Employing advocates and peer navigators may facilitate access and use of needed resources. Possible co-location and/or coordinated referrals and/or applications to these resources may help improve access and medical compliance as well as decrease barriers associated with transportation and scheduling. Postnatal logistics such as transportation and scheduling become even more complex for women attempting to manage their own multiple recovery-related appointments per week (sometimes daily), their infant's needs and appointments, as well as applying for and accessing public assistance and other programs (Gopman, 2014). Also, coordinated resource access and assistance may have further-reaching positive implications for the short and long-term health and well-being of women and their children (Alhusen, Lucea, Bullock, & Sharps, 2013; Daoud et al., 2016).

4.2. Study limitations

Limitations include: potential biases inherent in self-reported data; generalizability; and possible unmeasured confounders including other social determinants of poor health outcomes. While the relatively small sample by statistical standards precluded multiple simultaneous control variables, sample size was in line with other single-site prospective cohort studies of pregnant women with OUD receiving similar prenatal and substance misuse interventions (Greenfield et al., 2007). Multi-site recruitment would have introduced layers of extraneous variability. Our sample cannot be generalized to more racial/ethnic and income-diverse populations. Additionally, these cross-sectional and path analyses indicate associations, not causal relationships. Nonetheless, this study is a step towards a more comprehensive understanding of the needs of this medically/ psychosocially vulnerable, dual-generation population during the prenatal period, and a step towards improving pre- and post-natal maternal-child interventions.

4.3. Conclusions

Identification of food/housing hardships, perception of psychological vulnerability with a partner, depressive symptoms, and history of PTSD within a pregnant population receiving prenatal care and treatment for OUD highlights needs for systematic, coordinated screening. Food/housing hardships represent significant, often unseen and underappreciated social determinates of maternal-child health and well-

being in this growing, high-risk population. Women in our sample were already interfacing with the medical system. One assumes that non-medically engaged women with OUD would experience *even greater material hardships than this sample*. Therefore, all agencies interfacing with women with substance use disorders, should screen for material hardships and have feasible referral and intervention options, aiming to understand/accommodate complexities of pre- and postnatal women (e.g. living with different learning styles and major mental health diagnoses, including PTSD) that might complicate treatment and the recovery process. Longitudinal research on samples of pregnant/parenting women with OUD should build on this study by examining pathways among these interrelated variables pertaining to long-term maternal-child outcomes.

Role of funding source

This research was supported by the United States Department of Health and Human Services, Administration for Children and Families under the Abandoned Infants Assistance Act (grant number 90CB0186). The funders had no role in the design, collection, analysis or interpretation of the data, writing of this manuscript, or the decision to submit this paper for publication.

Contributors

The corresponding author Rose-Jacobs designed the study in conjunction with authors Trevino-Talbot and Cabral. Authors Rose-Jacobs and Trevino-Talbot coordinated the data collection and wrote the initial draft of the manuscript, and authors Cabral and Lloyd-Travaglini conducted the statistical analyses. Author Vibbert assisted with data interpretations and assisted with significant edits of earlier drafts. All authors contributed to the interpretation of findings and reviewed and approved the final manuscript.

Acknowledgements

We thank the women who participated in this study and the research assistants who interviewed them; Robert Sege MD who was the initial study PI; and Kelley Saia MD who facilitated our identification of study participants and gave us ongoing input into the research.

Conflict of interests

All authors declare that they have no conflicts of interest to report.

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