



Stressful life events and social support among pregnant Marshallese women

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Accepted: 3 March 2022 / Published online: 12 May 2022

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Abstract

Introduction Women from racial and ethnic minority groups in the United States are disproportionately likely to experience adverse perinatal outcomes such as preterm birth, low birthweight infants, and infant mortality. Previous research has demonstrated that exposure to stressful life events and social support may influence perinatal outcomes. Although studies have documented stressful life events and social support for the general United States population and minority groups, less is known about the experiences of Pacific Islander women in the United States, and no prior studies have documented these experiences in Marshallese Pacific Islander women.

Methods The present study examined data collected from pregnant Marshallese women (n = 67) in northwest Arkansas participating in a women's health program using descriptive analyses (means, standard deviations, proportions).

Results Results indicated a high prevalence of three stressful life events: experiencing a family member going into the hospital (35.8%), someone close to them dying (29.9%), and being unable to pay bills (53.7%). Food insecurity was higher than previously reported for pregnant women or Pacific Islanders (83.7%). Social support was high among the sample. A majority of women reported receiving help with daily chores (86.6%), help when sick (88.1%), and support on how to deal with personal problems (85.1%).

Discussion This study is the first to document the prevalence of stressful life events and social support in a sample of pregnant Marshallese women living in the United States. The findings provide important information to guide efforts to reduce adverse perinatal outcomes in a Pacific Islander population.

Keywords Pregnancy · Maternal health · Social determinants of health · Stress · Pacific Islander · Marshallese social support

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Significance

What is already known on this subject?

Previous research has found disparities in adverse perinatal outcomes for racial and ethnic minority women living in the United States. Evidence suggests stressful life events predict adverse perinatal outcomes, but social support may provide some protection from these outcomes.

What this study adds

Although previous studies have examined the association between stress, social support, and adverse perinatal outcomes for Black and Hispanic women, very few have examined the experiences of Pacific Islander women. This study

adds to this literature and is the first to report prevalence of stressful life events and social support in a Marshallese Pacific Islander population in the United States.

Introduction.

In the United States (US), public health efforts have contributed to the reduction in adverse perinatal outcomes (Centers for Disease Control and Prevention 2021a, 2021b). Despite these efforts, racial and ethnic minority inequities in perinatal outcomes persist (Centers for Disease Control and Prevention 2021b, 2021a; Willis et al., 2014). Social determinants of health have been identified as contributing factors (Amjad et al., 2019; Giurgescu, 2017; Healthypeople.gov, 2019; Thoma et al., 2019), and research demonstrates stressful life events may be a contributing factor to adverse perinatal outcomes (Harville et al., 2010; Hux & Roberts, 2015; Mendez-Figueroa et al., 2019; Oyarzo et al., 2012; Traylor et al., 2020). Stress exposure across the life course activates physiological responses and accelerates biological aging, undermining health generally (Danese & McEwen, 2012). Acute and chronic stress have been associated with a variety of adverse perinatal outcomes such as preterm birth, preeclampsia, infant morbidity, and low birthweight infants (Vianna et al., 2011; Wadhwa et al., 2011). In 2010, data from the Centers for Disease Control Pregnancy Risk Assessment Monitoring System (PRAMS) found 75% of women reported at least one stressful event during their pregnancy (Burns et al., 2015). The most common stressors included moving, serious illness of a family member, and inability to pay bills (Burns et al., 2015). Racial and ethnic minority women are often at risk for multiple stressful life events during pregnancy (Lu & Chen, 2004; Silveira et al., 2013; Zhao et al., 2015). The risk of exposure to stress during pregnancy is higher for low-income women of color (Hatch & Dohrenwend, 2007; Koning & Ehrenthala, 2019), including financial struggles, job loss or unemployment, food insecurity, domestic violence, and homelessness (Borders et al., 2007; Braveman et al., 2010).

Research has documented the disparities in stressful life events for pregnant Black and Hispanic women (Brunst et al., 2014; Dominguez, 2008; Grobman et al., 2018; Lefmann et al., 2017), but less is known about stressful life events and social support for Pacific Islander women (Schempf et al., 2010). Pacific Islanders are the second-fastest growing population in the US (Hixson et al., 2012). Arkansas has had especially high growth, with the Pacific Islander population increasing 252% between 2000 and 2010 (Arkansas Department of Education Data Center, 2016; Arkansas Department of Health & Arkansas Vital Records Office, 2015). Pacific Islanders are underrepresented in research, and available research often aggregates data across Pacific Islanders and Asian Americans, obscuring disparities (Park et al., 2009; Ro & Yee, 2010; Roehr, 2010; Schempf et

al., 2010; Srinivasan & Guillermo, 2000; Working Group of the Applied Research Center & the National Council of Asian Pacific Americans 2013). Data available include limited studies demonstrating that Pacific Islander women experience higher prevalence of preterm birth and lower birthweight infants and are also more likely to experience preeclampsia, primary cesarean delivery, excessive gestational weight gain, and gestational diabetes mellitus (Chang et al., 2015; Chang et al., 2010; Choi, 2008; Hawley et al., 2014; Utah Department of Health, 2009; Nembhard et al., 2019; Schempf et al., 2010; Shen et al., 2005; Todd & Peabody, 2004).

The majority of Pacific Islanders in Arkansas are Marshallese migrants from the Republic of the Marshall Islands, where the US tested nuclear weapons between 1946 and 1958 (Arkansas Department of Education Data Center, 2016; Arkansas Department of Health & Arkansas Vital Records Office, 2015; Barker, 2012; McElfish et al., 2015; United States Census Bureau, 2010a, 2010b). Tests exposed islanders to significant levels of nuclear radiation (Barker, 2012; Guyer, 2001; Pollock, 2002). Studies have demonstrated health problems affecting exposed individuals and changes in Marshallese health behaviors (Barker, 2012; Gittelesohn et al., 2003; McElfish et al., 2016; McLennan & Ulijaszek, 2015). Previous analyses of birth records (n=2,488) documented the following among Marshallese living in Arkansas: 15% of Marshallese women received no prenatal care (compared to 1.6% women nationally); half do not receive prenatal care visits during their first trimester (compared to 22.9% nationally); 19% of Marshallese infants were born preterm (compared to 9.6% nationally); and 15% of Marshallese infants were low birthweight (compared to 8.3% nationally; Nembhard et al., 2019; Osterman & Martin, 2018). Despite evidence of adverse perinatal outcomes for Marshallese women, no research explores stressful life events among Marshallese or other Pacific Islander pregnant women. The present study fills this gap in the literature by examining the prevalence of stressful life events and social support among pregnant Marshallese women.

Methods.

Data Sources and Participants.

Data were collected from the enrollment survey for a women's health program offered by the University of Arkansas for Medical Sciences. Both pregnant and non-pregnant women take part in the program; however, only pregnant women are included in the study. Participants provided verbal consent for data collection at the time of enrollment. The data collection portion of the women's health program was conducted in accord with prevailing ethical principles and was determined by the University of Arkansas for Medical Sciences Institutional Review Board to be exempt (#239466). Sixty-seven pregnant Marshallese women

completed the program's enrollment survey between July 2019 and January 2021.

Measures and Data Collection.

Care coordinators administered questions to participating clients and recorded responses in REDCap (Research Electronic Data Capture; Harris et al., 2009; Harris et al., 2019). Stressful life events were measured using the Modified Life Events Inventory 14-item scale (Newton et al., 1979) as utilized in PRAMS (Shulman et al., 2018), and social support was measured using an abbreviated Medical Outcomes Study social support survey (Sherbourne & Stewart, 1991), with those reporting "all of the time" or "most of the time" as having social support. A validated 2-item food insecurity assessment was also added in December 2019 as part of quality improvement; therefore, these items were not administered to all participants (Hager et al., 2010). Additional measures collected and analyzed (e.g., health insurance status; father/partner involvement; Special Supplemental Nutrition Program for Women, Infants, and Children [WIC] and Supplemental Nutrition Assistance Program [SNAP] needs assessment; and housing insecurity) were assessed using questions adapted from PRAMS (Shulman et al., 2018).

Data Analysis.

Descriptive statistics, including means and standard deviations for continuous variables and proportions for categorical variables, are presented to characterize participants. Analyses included participant demographics and the domains of interest: stressful life events, social support, health insurance status, father/partner involvement, WIC/SNAP needs assessments, housing insecurity, and food insecurity. All analyses were conducted using R/RStudio (R Core Team, 2019; RStudio Team, 2018).

Results.

Participants had a mean age of 28.2 (SD = 6.6) at enrollment in the program, and 42.2% of participants reported being uninsured. A majority of participants were married, a member of an unmarried couple, or living with a partner (77.3%) and had a high school degree/GED or less (83.6%). Participants reported an average household size (adults and children) of 6.1 (SD = 2.8). A majority of participants reported needing, but not having applied for, WIC (71.6%) and SNAP (59.7%). Several participants reported already receiving or having applied for WIC (17.9%) and SNAP (17.9%) (Table 1).

A majority of participants were food insecure (83.7%). None of the participants reported home ownership, and almost all reported renting or sharing a home (97%). Over one-third (37.3%) of pregnant Marshallese women reported having a concern about housing; of those, 84% reported unstable housing due to non-payment of rent or past due

Table 1 Sociodemographic characteristics of pregnant Marshallese Healthy Start participants (n = 67)

	N (%) or Mean ± SD
Age	28.2 ± 6.6
Household Size (n = 64)	6.1 ± 2.8
Marital Status at Enrollment (N = 66)^a	
Single/Never married	15 (22.7)
Married/A member of an unmarried couple/Living with partner	51 (77.3)
Divorced/Separated	0 (0)
Widowed	0 (0)
Education^a	
Less than high school	23 (34.3)
High school graduate or GED completed	33 (49.3)
Some college/vocational school	10 (14.9)
Bachelor's degree/College graduate	1 (1.5)
More than college/Graduate or professional school	0 (0)
Insurance at Enrollment (n = 64)^{a,b}	
Insured	37 (57.8)
Uninsured	27 (42.2)
Household Income (n = 65)^a	
Less than \$20,000	18 (27.7)
More than \$20,000	45 (69.2)
Don't know	2 (3.1)
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Needs Assessment	
Receiving	11 (16.4)
Have applied for	1 (1.5)
Need	48 (71.6)
Not applicable	7 (10.4)
Supplemental Nutrition Assistance Program (SNAP) Needs Assessment	
Receiving	9 (13.4)
Have applied for	3 (4.5)
Need	40 (59.7)
Not applicable	15 (22.4)

^aQuestion changed by funding agency in May 2020. Responses have been collapsed and re-coded.

^bThe health insurance question allowed for multiple response options. Responses have been collapsed and re-coded.

rent, and 80% reported concern with non-payment of utilities or utility shut-off (Table 2).

More than three-fourths of participants reported one or more stressful life events (76.2%), and over half reported at least two stressful life events in the past twelve months (55.3%). A majority of participants reported having experienced problems paying the rent, mortgage, or other bills (53.7%), and 21% of participants reported moving to a new address. Over one-third of participants reported having a close family member who was very sick and had to go into the hospital (35.8%), and 30% reported having someone very close to them die. For social support, a majority of participants reported having someone available to help

with daily chores (86.6%), help if they were sick (88.1%), or turn to for suggestions about how to deal with a personal problem (85.1%). Almost all participants (92.5%) reported having a supportive partner (Table 3).

Discussion.

This study examined the prevalence of stressful life events and social support among pregnant Marshallese women living in Arkansas. Pregnant Marshallese women face many stressful life events stemming from socioeconomic and health inequities while also reporting strong social support within and among families. Participants reported a high prevalence of family members being hospitalized (35.8%), someone close to them dying (29.9%), and being unable to pay bills (53.7%). The proportions for these three specific stressful life events were higher in this study than in any racial/ethnic subpopulations reported in a larger PRAMS study (Lu & Chen, 2004; see Limitations for possible effects of the COVID-19 pandemic).

Until recently, unequal death exposure has been an overlooked source of racial/ethnic health disparities in the US (Umberson et al., 2017). The exposure to death through the loss of a loved one is one of the most stressful life events people experience, leading to a potential loss of resources, including social support. The loss of resources alters one's social environment in ways that may lead to additional stressful events (Pearlin et al., 2005; Umberson, 2017). The accumulation of stressful events across the life course have been shown to activate physiological responses that may lead to adverse perinatal outcomes (Danese & McEwen, 2012; Hux et al., 2014; Vianna et al., 2011; Wadhwa et al., 2011).

Many of the pregnant Marshallese women reported social support in the form of receiving help with daily chores (86.6%), receiving help when sick (88.1%), and having someone to turn to for suggestions about how to deal with personal problems (85.1%). Although social support has been documented as generally protective against negative health outcomes and as important resources for coping with stress (Umberson & Karas Montez, 2010), reviews of this literature reveal the somewhat limited benefits of social support (Thoits, 1995). Marshallese women in this study reported high levels of both stressful life events and high levels of social support, raising questions about the capacity of social support to cope with stressful events in a population that faces multiplicative stressors.

The prevalence of food insecurity among participants was extremely high (83.7%). This reported level of food insecurity is much higher than has been documented during pregnancy in other populations including Pacific Islanders living the US. Prior to the COVID-19 pandemic, 10.5% of the US population was estimated to be food insecure (Coleman-Jensen et al., 2020), and a study of Behavioral Risk

Table 2 Food and housing insecurity (n = 67)

	N (%)
Food Insecurity (n = 43)	
Food insecure	36 (83.7)
Food secure	7 (16.3)
Housing Status	
Owns or shares home, condominium, or apartment	0 (0)
Rents or shares own home or apartment	65 (97)
Lives in public housing	0 (0)
Lives with parent or family member	2 (3)
Homeless	0 (0)
Some other arrangement	0 (0)
Has Housing Concern	
Yes	25 (37.3)
No	39 (58.2)
Don't know	3 (4.5)
Housing Concerns (n = 25)	
Received an eviction notice	0 (0)
Non-payment of rent or past due rent	21 (84)
Unable to pay future rent because lost housing subsidy, job, or other income source	0 (0)
Non-payment of utilities or utility shut-off	20 (80)
Housekeeping concerns (failure to maintain cleanliness of the unit)	2 (8)
Housing is or will be condemned	0 (0)
Friend or family member being evicted or threatened with eviction	0 (0)
Threat of abuse by partner, family member, or other	0 (0)
Being discharged or service is being terminated	0 (0)
Personal conflict with others	0 (0)
Other health or safety concerns	0 (0)
Other lease violation(s)	0 (0)
Other	1 (4)

Factor Surveillance System data showed 33.6% of pregnant Pacific Islanders in Hawaii were food insecure (Stupplebeen, 2019). Moreover, only 16.4% and 13.4% of participants reported currently receiving WIC and SNAP benefits, respectively. Our results indicate 71.6% of participants needed to apply for WIC benefits, and 59.7% needed to apply for SNAP benefits but had not done so. These findings demonstrate pregnant women may need more assistance in the application process for benefits, helping to alleviate food insecurity during pregnancy.

Housing was also a concern for many participants (37.3%), and more than half (53.7%) of participants reported worrying about paying the rent, mortgage, or other bills. Previous studies have found 44.8–46% of adults living in Hawaii worried about paying rent and other bills (Pobutsky et al., 2015; Stupplebeen, 2019), so a higher proportion in Arkansas is surprising, given Hawaii has the highest cost of

living in the US (1st) and Arkansas has the second-lowest (50th) (US Department of Commerce, Bureau of Economic Analysis, 2020).

Lack of reported health insurance was also notably high (42.2%) in the sample relative to other groups of Pacific Islanders living in the US (Park et al., 2018). However, the lack of insurance is similar to the previously-reported proportion of uninsured Marshallese adults in Arkansas (46.4%) (McElfish et al., 2017). Prior to early 2021, Marshallese adults living in the US were not eligible to receive Medicaid benefits unless they were pregnant due to their Compact of Free Association (COFA) migrant status (McElfish et al., 2015). Of particular concern is that almost half of pregnant Marshallese women in Arkansas report they are uninsured despite being eligible for Medicaid. The results indicate a need for additional efforts to assist with Medicaid applications, both for currently pregnant women and for the Marshallese community as a whole as they become eligible for Medicaid benefits.

Limitations.

Results should be interpreted with limitations in mind. The study sample size was small, and all women in the sample are part of a women's health program; therefore, the results of this study may not be generalizable to other Pacific Islanders or to Marshallese residing outside of Arkansas. Although data were collected from pregnant participants, participants varied in their gestational age during data collection, which may introduce variability in experiences of social support and stressful life events. Additionally, though measured using an abbreviated Medical Outcomes Study social support survey (Sherbourne & Stewart, 1991), social support was adapted and abbreviated by a nationally-convened Collaborative Improvement and Innovation Network specific to the women's health program and, thus, cannot be scored and compared to previous studies utilizing the original scale. Of additional importance is acknowledging the potential effects of COVID-19 in this study, as approximately one-third of participants were enrolled during or after March 2020 (n = 22). The COVID-19 pandemic may have had an effect on both the number of stressful life events and amount of social support received during this time period. The Marshallese have experienced disproportionately high rates of COVID-19 infection, hospitalization, and death from COVID-19 (Center et al., 2020). Despite these limitations, this study is the first to document stressful life events and social support among Marshallese pregnant women residing in the US.

Policy Implications.

Using research findings to assist communities is an important part of the community-engaged participatory approach (Chen et al., 2010; Purvis et al., 2017). In addition to contributing new knowledge, insights from this study

Table 3 Stressful life events and social support (n = 67)

	N (%) or Mean ± SD
Total Stressful Life Events (out of 14)	1.7 ± 1.3
Total Stressful Life Events (out of 14)	
0	16 (23.9)
1	14 (20.9)
2	20 (29.9)
3 or more	17 (25.4)
Stressful Life Events	
A close family member was very sick and had to go into the hospital	24 (35.8)
I got separated or divorced from my husband or partner	4 (6)
I moved to a new address	14 (20.9)
I was homeless or had to sleep outside, in a car, or in a shelter	0 (0)
My husband/partner or parent/guardian lost his or her job	8 (11.9)
I lost my job even though I wanted to go on working	1 (1.5)
My husband/partner, parent/guardian, or I had a cut in work hours or pay	5 (7.5)
I was apart from my husband/partner or parent/guardian due to military deployment or extended work-related travel	0 (0)
I argued with my husband/partner or parent/guardian more than usual	0 (0)
My husband/partner or parent/guardian said he or she didn't want me to be pregnant (n = 66)	0 (0)
I had problems paying the rent, mortgage, or other bills	36 (53.7)
My husband/partner, parent/guardian, or I went to jail	0 (0)
Someone very close to me had a problem with drinking or drugs	0 (0)
Someone very close to me died	20 (29.9)
If You Needed it, How Often is Someone Available to...? (responded "all of the time" or "most of the time")	
Provide temporary financial support	24 (35.8)
Do something enjoyable with you (n = 66)	32 (48.5)
Help with daily chores	58 (86.6)
Help you if you were sick	59 (88.1)
Turn to for suggestions about how to deal with a personal problem	57 (85.1)
Father/Partner Involvement^a	62 (92.5)

^aQuestion responses changed by funding agency in May 2020. Presented are the number and percentage of participants who reported "Involved in my pregnancy and supportive of me" or "Involved in my pregnancy and supportive of me and the child I'm carrying."

can inform public health interventions for the Marshallese

community. We find that Marshallese women experience several specific stressful life events immediately prior to or during pregnancy, including high prevalence of family health stress, financial and housing instability, food insecurity, lack of health insurance, and lack of WIC and SNAP support. The University of Arkansas for Medical Sciences women's health program addresses numerous concerns identified in this study and provides Marshallese care coordinators to help pregnant Marshallese women: (1) enroll in health insurance; (2) utilize health insurance; and (3) connect with resources such as WIC, SNAP, and food pantries. This study also revealed high levels of family support in the Marshallese community. Previous studies have indicated health behavior interventions incorporating a family model is highly effective among Pacific Islander communities (McElfish et al., 2021; McElfish et al., 2019). Future interventions should incorporate group or family-centric models for pregnant Pacific Islander women.

Conclusion.

This study is the first to document stressful life events and social support among pregnant Marshallese women. The findings show evidence of the considerable economic, social, and health challenges these women face. The findings also show strong evidence of the ability of the highly collectivistic and family-oriented Marshallese culture to provide strong social support within their community (Yeary et al., 2017). The high levels of both stressful life events and social support indicate need for further study to better understand the capacity of social support to protect against stressful life events during pregnancy.

Acknowledgments None.

Authors' contributions CAB performed all analyses, finalized edits for the entire article, and worked with CAW and DEW to create initial framing of the article based on analyses; DEW provided edits throughout and worked with CAB and CAW to help create initial framing of the article based on analyses; CAW provided edits throughout, provided feedback on framing and analyses, worked with CAB and DEW to help create initial framing of the article based on analyses, and performed the first draft of the literature review on social support and stress; BLA provided edits throughout, performed the first draft of the literature review on women's health and Marshallese/Pacific Islander background, and provided the first draft of policy implications; JAA provided edits and feedback on framing and analyses; PAM provided edits throughout and guiding framing of the article at every step.

Funding The study was supported by a Health Resources and Services Administration Healthy Start Award [#1 H49MC32729-01-00] and a Centers for Disease Control and Prevention Racial and Ethnic Approaches to Community Health Award [#5 NU58DP006595-03-00]. Additional support was provided by a University of Arkansas for Medical Sciences Translational Research Institute grant from the National Center for Advancing Translational Sciences of the National Institutes of Health [# U54 TR001629 and #UL1 TR003107] and a University of Arkansas for Medical Sciences Translational Research Institute grant through the National Center for Advancing Translational Sciences of

the National Institutes of Health [#KL2 TR003108]. The work was also partially supported by the National Institute of General Medical Sciences of the National Institutes of Health [#5 P20GM109096]. The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

Availability of data and material Not applicable.

Code availability All analyses were conducted using R/RStudio.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethics approval The data collection portion of the women's health program was conducted in accord with prevailing ethical principles and was determined by the University of Arkansas for Medical Sciences Institutional Review Board to be exempt (#239466).

Consent to participate Participants provided verbal consent for data collection at the time of enrollment.

Consent for publication Not applicable.

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