Stress in the City: Influence of Urban Social Stress and Violence on Pregnancy and Postpartum Quality of Life among Adolescent and Young Mothers

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ABSTRACT *Adolescent and young mothers transitioning from pregnancy to postpartum need to maintain an optimal quality of life. Stress and exposure to violence (e.g., intimate partner violence (IPV), nonpartner violence) are predictors of poor quality of life for adult women; however, these associations remain understudied among adolescent and young mothers in urban areas. Guided by the social ecological model, the current study created a latent variable, urban social stress, to examine the impact of the urban social environment (i.e., stressful life events, discrimination, family stress, and neighborhood problems) on the quality of life of adolescent and young mothers during both pregnancy and postpartum. The current study is a secondary data analysis of a prospective cohort study of 296 expectant young mothers recruited at obstetrics and gynecology clinics. Results from structural equation and multigroup models found that higher urban social stress predicted lower mental and physical quality of life during pregnancy, but these associations were significantly stronger for IPV-exposed and nonpartner violence-exposed mothers. In the postpartum period, higher urban social stress predicted lower mental and physical quality of life, but these associations were significantly stronger for IPV-unexposed and nonpartner violence-exposed mothers. Stress reduction programs need to help adolescent and young mothers in urban areas develop stress management skills specific to urban social stress. Pregnancy and parenting programs need to be tailored to the specific needs of young mothers in urban areas by becoming sensitive to the role of IPV and nonpartner violence in these young women's lives.*

KEYWORDS *Adolescent mothers, Intimate partner violence, Quality of life, Stress, Nonpartner violence, Social ecological model*

INTRODUCTION

Developing and sustaining a positive mental and physical quality of life is vital as mothers begin transitioning from pregnancy to the postpartum period.^{1, 2} Mental and physical quality of life is often operationalized as a subjective assessment of one's health and wellbeing taking into account cultural, social, and environmental factors.³ A low quality of life during pregnancy has been associated with adverse

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pregnancy complications including preterm birth and low birth weight.^{4, 5} In the USA, adolescent and young mothers have a lower quality of life compared with nonparenting adolescents,⁶ yet, there remains a paucity of studies identifying risk factors among this population. This is concerning since the adolescent pregnancy rate is significantly higher in the USA compared with other western countries.⁷ The few studies examining risk factors of poor quality of life among adolescent mothers indicate that developmental changes associated with both pregnancy and adolescence may result in stress^{6, 8–10}; however, the context and living conditions of adolescent and young mothers may also influence their health and wellbeing.

Living in an urban area can expose adolescents to social and ecological factors that may be stressful and contribute to poor health.¹¹ To date, urban health research has demonstrated that the complexities of urban areas can shape community and population health.^{12, 13} For example, urban stressors—chronic stress felt by adolescents taking into account social factors such as race and the environment, are important indicators of poor social and developmental outcomes.¹¹ Research examining the impact of living in an urban area is broadly categorized into three themes: the urban physical environment, the urban social environment, and health and social services.^{12, 14} While the urban physical environment focuses on the environmental conditions of urban areas (e.g., noise pollution) and health and social services targets the availability of services (e.g., barriers to quality care), the urban social environment (e.g., high levels of stressors) centers on how contextual factors of urban living impacts one's behavior and contributes to the distribution of disease and health,^{12, 14} especially among adolescents.¹⁵ The urban social environment may play a significant role on quality of life among adolescent and young mothers in urban areas, yet this association remains unknown. As adolescent motherhood disproportionately affects racial/ethnic minorities and socioeconomically disadvantaged adolescents¹⁶ and also relates to a myriad of negative outcomes for both the mother and child,¹⁷ it becomes increasingly important to understand how the urban social environment may influence health outcomes for adolescent and young mothers in urban areas.

The social ecological model is useful for exploring the effects of the urban social environment on the health of adolescent and young mothers in urban areas. The social ecological model states that the behavior and development of an individual is largely affected by multiple levels: individual, interpersonal (e.g., family), and community.¹¹ Guided by the social ecological model, this paper operationalizes urban social stress as stress experienced by adolescent and young mothers in urban areas taking into account the urban social environment. Urban social stress consists of stressors that appear in high prevalence for adolescent and young mothers in urban areas. Extant research indicates that adolescents living in urban areas, including adolescent and young mothers, often endure high levels of discrimination,¹⁸ stressful life events,¹⁹ neighborhood problems,^{11, 20} and family stress.^{21, 22} Using the social ecological model, these stressors can be organized onto the following levels: individual includes stressful life events; interpersonal includes family stress, and community includes discrimination and neighborhood problems. With a foundation in both urban social environment and the social ecological model, urban social stress provides the comprehensive approach needed to understand how complex social interactions and experiences impact the health of adolescent and young mothers in urban areas.²³

The social ecological model has been used to examine the health of pregnant urban adolescents;^{24, 25} however, few studies have used this model to create a latent variable such as urban social stress. Latent variables are useful as they allow

research to investigate and explain relationships between independent variables that, collectively, represent a theoretical model or construct.²⁶ Examining the components of urban social stress (i.e., discrimination, stressful life events, family stress, and neighborhood problems) as independent experiences may be insufficient for young mothers living in urban areas as these components often do not occur in isolation,^{27, 28} and have been independently associated with poor health in other diverse populations.^{11, 28} As a latent variable, urban social stress is a multi-level stressor representing different components of the urban social environment that are relevant to the lived experiences of adolescent and young mothers in urban areas. Adolescent and young women living in urban areas, including young mothers and racial/ethnic minorities, are often exposed to multiple stressors across social contexts,^{22, 28, 29} thus, there is a need to use latent variables to understand how the urban social environment affects the quality of life of adolescent and young mothers.

The quality of life among mothers significantly improves from pregnancy to the postpartum period,³⁰ yet, urban social stress could impede this improvement. Studies have found that other forms of stress including psychological distress¹¹ and low socioeconomic resources¹⁹ can lead to strain and contribute to poor quality of life among pregnant women. Expanding this research, higher urban social stress could also relate to poor quality of life during both pregnancy and the postpartum period for adolescent and young mothers in urban areas; however, this relationship remains underexplored. Research examining the longitudinal effects of urban social stress on quality of life among adolescent and young mothers in urban areas is especially important since the effects of stress persists over time for urban adolescents.^{11, 20}

The impact of urban social stress on the quality of life of adolescent and young mothers living in urban areas may have a more adverse effect for those with exposure to violence compared with those without these experiences. Exposure to violence such as intimate partner violence (IPV) and nonpartner violence can differentially contribute to the relationship between stress and women's wellbeing.³¹⁻³⁵ Stewart et al.³⁵ found that low social support was a significant predictor of a major depressive disorder episode for mothers with experiences of IPV compared with mothers without experiences of IPV. Violent experiences can lead to physical, emotional, and social problems,³⁶ and the additive effects of urban social stress could further compromise the health of violence-exposed young mothers. Adolescent and young mothers living in urban areas are an at-risk population for both IPV and nonpartner violence,^{21, 37} yet few studies have examined whether the effects of stress differentially impacts the quality of life of violence-exposed and violence-unexposed young mothers living in urban areas. As violence continues to be a part of the lived realities of young mothers in urban areas, concerted research and intervention efforts should be focused on improving health outcomes and assisting young mothers in the transition from pregnancy to the postpartum period.

The aims of the current study is to: (1) examine the impact of urban social stress on the pregnancy and postpartum quality of life for adolescent and young mothers, (2) assess how exposure to IPV and nonpartner violence affects pregnancy and postpartum quality of life, and (3) examine IPV or nonpartner violence as effect modifiers on the association between urban social stress and pregnancy and postpartum quality of life. This study hypothesized that: (1) higher urban social stress would significantly predict lower mental and physical quality of life during pregnancy and postpartum; (2) experiencing IPV and nonpartner violence would significantly predict poor mental and physical quality of life during pregnancy and postpartum; and (3) effects of urban social stress on mental and physical quality of

life would be significantly different between violence-exposed (i.e., IPV and nonpartner violence) and violence unexposed adolescent and young mothers, such that the association would be exacerbated for violence-exposed young mothers.

METHODS

Procedure

The current study is a secondary data analysis of data collected from a longitudinal study designed to assess relationship changes from pregnancy to postpartum and the effect of relationship changes on the sexual and reproductive health of pregnant adolescents and their male partners. Two hundred and ninety-six pregnant couples ($N=592$ participants) were recruited from obstetrics and gynecology clinics and an ultrasound clinic in four university-affiliated hospitals in three urban cities located in the northeast region of the USA between July 2007 and February 2011. Participants were screened and if eligible, they were provided information on the study and the research staff answered any questions. If either the biological father or mother was absent during the screening process, research staff asked for permission to contact their partner to explain the study. The participation rate for the longitudinal study was 72 %. The only difference between those who enrolled in the study versus those who did not was that those who refused to participate were on average two weeks further along in their pregnancy compared with those who participated ($p<0.05$).

The study's inclusion criteria was: (a) expectant females in their second or third trimester, (b) both partners report being the biological parents of the unborn baby and in a romantic relationship with each other, (c) females between the age of 14 and 21 years old and male partners aged at least 14 years, (d) both partners agreed to participate in the study, and (e) able to speak English or Spanish. Because the study was longitudinal, an initial run-in period was conducted as part of the eligibility criteria. Participants were deemed ineligible if they were unable to be re-contacted after screening and before their estimated due date.

During the baseline interview, the research staff obtained written informed consent. Each partner of the couple completed structured interviews by audio computer-assisted self-interviews. At the end of the interview, participants were remunerated \$25 and provided with a list of community resources including those for employment, mental health treatment, and violence-related services. Participants who disclosed IPV and nonpartner violence to the research staff were referred to health professionals at the participating clinics. The study clinics and host institution's Institutional Review Boards approved all procedures.

For the current study, we were interested in the experiences of adolescent and young mothers. As a result, only the female participants with valid baseline data were included in the analyses. This resulted in a final sample of 296 females.

Measures

Predictors. All predictors and covariates were assessed at the baseline interview during pregnancy (Time 1).

Urban social stress latent class indicators were stressful life events, discrimination, neighborhood problems, and family functioning. The *stressful life events* latent class indicator was assessed using an 11-item scale adapted from the Life Events scale.³⁸ Participants were asked to report whether they experienced each of the stressful life events (e.g., having a serious illness, having money problems) in the previous 6 months. If they

answered in the affirmative, they were scored as a 1 for experiencing that specific event. By summing the item responses, a total score was created, with higher scores indicating high levels of stressful life events. Internal consistency was adequate (Cronbach's $\alpha=0.65$). The *discrimination* latent class indicator was assessed using a 19-item scale adapted from the Daily Life Experiences scale.³⁹ Participants were asked questions concerning their ongoing everyday experiences of discrimination (e.g., ignored, overlooked, or not given service). The frequency of the discrimination was ranked on a scale ranging from 0 (never) to 5 (once a week or more). By summing the item responses, a total score was created, with higher scores indicating high levels of discrimination. Internal consistency was adequate (Cronbach's $\alpha=0.92$). The *neighborhood problems* latent class indicator was assessed using a 13-item scale adapted from the perceived neighborhood problems.⁴⁰ Participants were asked questions pertaining to their perception of their neighborhood's quality (e.g., vandalism, smells and fumes). Participants were asked to respond to the items on a scale from 1 (not a problem) to 3 (serious problem). There were two changes made to the original scale: two additional items were added (i.e., feeling unsafe after dark and drugs). By summing the 13-item responses, a total score was created, with higher scores indicating more neighborhood problems. Internal consistency was adequate (Cronbach's $\alpha=0.95$). The *family stress* latent class indicator was assessed using a 12-item scale adapted from Family Functioning scale.⁴¹ Participants were asked questions pertaining to five dimensions of family functioning: positive family affect (e.g., I feel loved by my family), family communication (e.g., My family listen when I speak), family conflicts (e.g., My family fight with each other), family worries (e.g., My family are not interested in what I do), and family support (e.g., My family accepts me as I am). Participants were asked to respond to the items on a scale from 1 (never) to 7 (always). The 12 items were summed to create a total score, with higher scores indicating more family stress. Internal consistency was adequate (Cronbach's $\alpha=0.82$).

Current partner IPV and lifetime nonpartner violence victimization was assessed using modified items from the physical assault and psychological aggression subscales of the revised Conflict Tactics scale (CTS-2),⁴² and the Sexual Experiences Survey (SES).⁴³ Participants were asked two questions to determine if they experienced physical IPV victimization with their current partner (e.g., ever shoved, punched, hit, slapped, or physically hurt them, threatened to physical hurt them); five questions for sexual IPV victimization (e.g., ever been forced to have sex, pressured into sex or other sexual activity, been threatened to have sex); and one question for emotional IPV victimization (e.g., swear, call your names, or insult). After answering the IPV questions, participants were asked if they experienced the same physical, sexual, and emotional victimization acts by a nonpartner. Participants who reported any physical, sexual, or emotional victimization acts by a nonpartner were asked to specify the perpetrator: stranger or acquaintance. Participants responded to each of the victimization acts as 1=yes and 0=no. Two summary, dichotomous variables were created: (1) any IPV in the current relationship (yes to any of the physical, sexual, or emotional IPV victimization acts in the current relationship) and (2) any nonpartner violence victimization (yes to any of the physical, sexual, or emotional victimization acts by a stranger or acquaintance).

The participants reported sociodemographics such as age, household income, race, gender, years of education, and employment status.

Outcomes. Outcomes were assessed at the baseline interview during pregnancy and at the follow-up interview at 6 months postpartum (Time 2).

Pregnancy and postpartum quality of life was assessed using the eight-item version of the Short Form Health Survey (SF-8).⁴⁴ The SF-8 is comprised of

two subscales: mental and physical quality of life. Participants were asked items related to the mental and physical health in the past 4 weeks (e.g., physical health problems limit your usual physical activities). The subscales are weighted linear composites based on population norms. This scale has been used in multiple studies within various populations including pregnant adolescent and young couples,⁸ people experiencing conflict.⁴⁵ Internal consistency for quality of life was adequate during pregnancy: mental (Cronbach's $\alpha=0.74$) and physical (Cronbach's $\alpha=0.66$); and postpartum: mental (Cronbach's $\alpha=0.76$) and physical (Cronbach's $\alpha=0.69$).

Data Analysis

Table 1 displays the descriptive statistics of the demographics, predictors, and outcomes. Two initial structural equation models were conducted to: assess the influence of urban social stress, IPV, and nonpartner violence on mental and physical quality of life during (1) pregnancy (Fig. 1) and (2) at 6 months postpartum (Fig. 2). Urban social stress was a latent variable that consisted of four observed indicators (i.e., stressful life events, discrimination, family stress, neighborhood problems). Using latent variables to describe the relationship between multiple stressors is consistent with previous literature.²⁸ Next, four separate multigroup models were conducted to determine if the relationship between urban social stress and pregnancy and postpartum quality of life differed by two different moderators: IPV and nonpartner violence victimization. In the IPV multigroup models, nonpartner violence was included as an independent variable; and in the nonpartner violence multigroup models, IPV was included as an independent variable. These models were constrained and compared with unconstrained models using a Chi square difference test. A significant Chi square difference test indicated that the structural path differed by either IPV or nonpartner violence.⁴⁶ Controlling for age, the initial and multigroup models were assessed for goodness of fit using the following indices: (1) a root mean square error of approximation less than 0.08, and (2) a CFI and TLI around 0.90. The regression coefficients for all models predicting postpartum quality of life were estimated using the MISSING estimator. This method allowed missing data at the postpartum or follow-up interview to be handled using the full-information maximum likelihood, by estimating the values for the missing data.⁴⁷ Descriptive statistics were performed in SPSS 21.0⁴⁸ and structural equation modeling was conducted in Mplus.⁴⁷

RESULTS

Sample Characteristics

Table 1 highlights the characteristics of the young mothers in the current study. The racial and ethnic makeup of the young mothers was 39.5 % African-American/Black, 20.9 % White, and 39.5 % Hispanic. The average age was 18.70 (SD=1.62). The average household size-adjusted income was 3750 (SD=4941). The average education in years was 11.75 (SD=1.82).

TABLE 1 Demographics, urban social stress, and quality of life among young mothers

	M (SD)	Range
Demographics		
Age (year)	18.7 (1.6)	15.0–21.0
Household size-adjusted income	3750 (4941)	250–31,500
Race (% (N))		
Black	39.5 (117)	–
White	20.9 (62)	–
Hispanic	39.5 (117)	–
Employment (% (N))		
Unemployed	71.6 (212)	–
Part-time	20.6 (61)	–
Full-time	7.8 (23)	–
Education (year)	11.7 (1.8)	8.0–20.0
IPV (% (N))	30.7 (91)	–
Nonpartner violence (% (N))	28.4 (84)	–
Urban social stress		
Stressful life events	2.1 (1.9)	0–11.0
Discrimination	0.8 (0.8)	0–3.7
Family stress	61.7 (12.6)	14.0–84.0
Neighborhood problems	22.4 (7.6)	15.0–44.0
Quality of life		
Mental quality of life—pregnancy	45.7 (10.6)	17.9–66.6
Mental quality of life—postpartum ^c	47.2 (10.9)	14.6–62.3
Physical quality of life—pregnancy	49.0 (8.3)	11.4–65.5
Physical quality of life—postpartum ^c	52.2 (6.7)	28.6–66.0

Percentages may not equal to 100 because they were rounded to the nearest tenth

Abbreviation: *IPV* = intimate partner violence

^aData are M (SD) unless otherwise indicated

^bTime 1 = baseline (during pregnancy); Time 2 = follow-up (6 months postpartum)

^cBased on a sample size of 225 young mothers

Fit Statistics for Urban Social Stress Latent Variable

The measurement model for the urban social stress latent variable was assessed to confirm that the observed variables loaded adequately. The overall fit of the measurement model was satisfactory, Comparative Fit Index (CFI)=0.99, Tucker Lewis Index (TLI)=0.97, and Root Mean Square Error of Approximation (RMSEA)=0.05, with factor loadings greater than 0.40.

Assessing Fit for Initial and Multigroup Models

Next, the overall fit for the two initial models was assessed for pregnancy quality of life (Fig. 1) and postpartum quality of life (Fig. 2) controlling for covariates (i.e., age). A satisfactory fit was found for both models: Pregnancy Quality of Life (CFI=0.98, TLI=0.97, RMSEA=0.02), and Postpartum Quality of Life (CFI=0.98, TLI=0.96, RMSEA=0.02). For the pregnancy quality of life analyses, 17 and 5 % of the variance was accounted for mental and physical quality of life, respectively. For the postpartum quality of life analyses, 14 and 3 % of the variance accounted for mental and physical quality of life, respectively.

While controlling for covariates, the overall fit for two multigroup models (i.e., an IPV multigroup and nonpartner violence multigroup) was assessed for both the

FIG. 1 Examining the effects of urban social stress, IPV, and community violence on mental and physical quality of life for young females during pregnancy, while controlling for age. Standardized coefficients are displayed. *Bidirectional arrows* represent correlations. Direct paths at a $p > 0.05$ are not shown. * $p < 0.05$; ** $p < 0.01$.

pregnancy and postpartum quality of life. For pregnancy quality of life (Fig. 1), a satisfactory fit was determined for both the IPV multigroup model (CFI=0.92, TLI=0.87, RMSEA=0.05), and nonpartner violence multigroup model (CFI=0.95, TLI=0.91, RMSEA=0.05). Similarly for postpartum quality of life (Fig. 2), a satisfactory fit was found for both the IPV multigroup model (CFI=0.92, TLI=0.88, RMSEA=0.05), and nonpartner violence multigroup model (CFI=0.95, TLI=0.93, RMSEA=0.04).

Examining the Associations Between Urban Social Stress, IPV, Nonpartner Violence, and Pregnancy Quality of Life

Structural equation modeling was performed to investigate the effects of urban social stress, IPV, and nonpartner violence on pregnancy quality of life (Fig. 1). Urban social stress significantly predicted mental and physical quality of life such that higher urban social stress was related to poor mental and physical health during pregnancy. Nonpartner violence significantly predicted physical quality of life such that experiences of nonpartner violence were related to poor physical health during pregnancy. IPV did not significantly predict pregnancy quality of life.

Subsequently, multigroup modeling was used to examine whether the associations on pregnancy quality of life differed by IPV (vs. IPV unexposed females). Results indicated that two structural paths differed: the effect of urban social stress on mental quality of life (Chi-square difference=41.66, $p < 0.05$), and the effect of nonpartner violence on physical quality of life (Chi-square difference=14.54, $p < 0.05$). For the urban social stress effect, both IPV-exposed ($B = -0.46$, $p < 0.001$) and IPV unexposed females ($B = -0.29$, $p < 0.01$), higher urban social stress was

FIG. 2 Predicting postpartum mental and physical quality of life from urban social stress, IPV, and community violence for young mothers, while controlling for age. Standardized coefficients are displayed. Direct paths at a $p > 0.05$ are not shown. *Bidirectional arrows* represent correlations. * $p < 0.05$; ** $p < 0.01$.

related to poor mental quality of life during pregnancy, but the magnitude of this effect was significantly stronger for young females who experienced IPV. For the nonpartner violence effect, findings showed that IPV-exposed females who experienced nonpartner violence reported poorer physical quality of life during pregnancy ($B = -0.29$, $p < 0.001$). For IPV unexposed females, there was no significant association between nonpartner violence and physical quality of life during pregnancy ($B = -0.07$, $p > 0.05$).

Next, results from another multigroup model examining if the same associations on pregnancy quality of life differed by nonpartner violence (vs. nonpartner violence unexposed) indicated that two structural paths differed: the effect of urban social stress on mental quality of life (Chi-square difference = 41.57, $p < 0.05$), and the effect of urban social stress on physical quality of life (Chi-square difference = 15.45, $p < 0.05$). For the effect of urban social stress on mental quality of life, both nonpartner violence-exposed ($B = -0.46$, $p < 0.001$) and nonpartner violence unexposed females ($B = -0.34$, $p < 0.001$), higher urban social stress was related to low mental quality of life during pregnancy, but the magnitude of this effect was significantly stronger for females who experienced nonpartner violence. For the effect of urban social stress on physical quality of life, findings showed that nonpartner violence unexposed females with high urban social stress reported poorer physical quality of life during pregnancy ($B = -0.18$, $p < 0.05$). For nonpartner violence-exposed females, there was no significant association between urban social stress and physical quality of life during pregnancy ($B = -0.14$, $p > 0.05$).

Urban Social Stress, IPV, and Nonpartner Violence as Correlates of Postpartum Quality of Life

We investigated whether urban social stress, IPV, and nonpartner violence related to postpartum quality of life (Fig. 2). Urban social stress significantly predicted mental quality of life such that higher urban social stress during pregnancy was related poor mental quality of life in the postpartum period. IPV significantly predicted physical quality of life such that young mothers experienced IPV were more likely to report better quality of life in the postpartum period. Nonpartner violence did not significantly predict postpartum quality of life.

Next, a multigroup model assessed whether the associations on postpartum quality of life differed by IPV (vs. IPV unexposed mothers). One structural path differed: the effects of urban social stress on mental quality of life (Chi-square difference=25.80, $p<0.05$). For the effect of urban social stress on mental quality of life, IPV unexposed mothers with high urban social stress during pregnancy reported poorer mental quality of life during the postpartum period ($B=-0.40$, $p<0.001$). For IPV-exposed mothers, there was no significant association between urban social stress and mental quality of life in the postpartum period ($B=-0.16$, $p>0.05$).

Results from a multigroup model assessing if the associations on postpartum quality of life differed by nonpartner violence (vs. nonpartner violence unexposed mothers) showed that three structural paths differed: the effects of urban social stress on mental quality of life (Chi-square difference=19.25, $p<0.05$), the effects of urban social stress on physical quality of life (Chi-square difference=12.81, $p<0.05$), and the effects of IPV on physical quality of life (Chi-square difference=4.17, $p<0.05$). For the effect of urban social stress on mental quality of life, both nonpartner violence-exposed mothers ($B=-0.35$, $p<0.001$) and nonpartner violence unexposed mothers ($B=-0.24$, $p<0.05$), higher urban social stress had low mental quality of life in the postpartum period, but the magnitude of this effect was significantly stronger for mothers who experienced nonpartner violence. For the effect of urban social stress on physical quality of life, findings showed that nonpartner violence-exposed mothers with high urban social stress reported poorer physical quality of life in the postpartum period ($B=-0.37$, $p<0.01$). For nonpartner violence unexposed mothers, there was no significant association between urban social stress and physical quality of life in the postpartum period ($B=-0.01$, $p>0.05$). For the effect of IPV, findings showed that nonpartner violence unexposed mothers who experienced IPV reported better physical quality of life in the postpartum period ($B=0.15$, $p<0.05$). For nonpartner violence-exposed mothers, there was no significant association between IPV and physical quality of life in the postpartum period ($B=0.15$, $p>0.05$).

DISCUSSION

Adolescent and young mothers living in urban areas experience multiple sources of stress across socio-ecological contexts, which can be challenging to endure during pregnancy and the postpartum period. Guided by the social ecological model, the current study illustrates the importance of using latent variables to conceptualize and measure stress among young mothers in urban areas. Copeland-Linder and colleagues²⁸ found that health risk behaviors for African-American females and males were differentially affected by contextual stress, a latent variable specific to the sociocultural context of African-American adolescents. Our findings build upon this research by creating urban social stress, a latent variable unique to the socio-

ecological context of young mothers living in urban areas. As a latent variable, urban social stress provides a clearer investigation of how individual, interpersonal, and community-level stressors within the urban social environment (i.e., stressful life events, discrimination, family stress, and neighborhood problems) affect the wellbeing of young mothers in urban areas. In particular, urban social stress is harmful to the mental and physical wellbeing of young mothers, which supports previous research.⁴¹ Our results extend previous research by demonstrating that the negative effects of urban social stress tend to persist in both pregnancy and the postpartum period for young mothers in urban areas, and thus contribute to suboptimal mental and physical health. Our findings also suggest that the relationship between urban social stress and quality of life is further complicated by young mothers' experiences of IPV and nonpartner violence. As hypothesized, urban social stress tends to be more harmful for violence-exposed mothers than violence unexposed mothers; however, depending on both the time point and the health outcome, urban social stress may harm violence unexposed mothers more than violence-exposed mothers. Together, results provide evidence for the need to integrate stress management strategies for urban social stress into pregnancy and parenting programs for young mothers and to tailor these programs to young mothers' experiences of both IPV and nonpartner violence.

Although urban social stress prevents healthy mental wellbeing for young mothers living in urban areas during pregnancy, the impact was stronger on the mental wellbeing of both IPV-exposed and nonpartner violence-exposed mothers. Women who experience IPV and nonpartner violence often endorse adverse mental health problems such as posttraumatic stress disorder and depression.^{36, 49} Young mothers who experienced either IPV by the father of their child or nonpartner violence may have experienced these mental health problems, which in combination with urban social stress, may lead to poorer mental health during pregnancy. However, in the postpartum period, urban social stress experienced during pregnancy continues to result in poor mental wellbeing for IPV unexposed mothers but not IPV-exposed mothers. This finding is important because it suggests that there are potential differences between IPV-exposed and unexposed mothers that allow the mental wellbeing of IPV-exposed mothers to be unaffected by urban social stress in the postpartum period. While several individual and relationship factors (e.g., resilience, relationship functioning) could explain this unique association, fully exploring these hypotheses would be beyond the scope of the current study. Therefore, additional research is needed to explore how individual and relationship factors differ among IPV-exposed and unexposed young mothers during the postpartum period. Further, improving young mothers' mental wellbeing should be a priority for pregnancy and parenting interventions. In particular, it is critical to develop stress reduction interventions focused on urban social stress and specifically target young pregnant mothers who experienced IPV with the father of their child and nonpartner violence.

A growing body of research highlights that stress can lead to altered biological processes (e.g., inflammation), contributing to poor physical health outcomes.⁵⁰ Our findings show that urban social stress is related to poor physical wellbeing during pregnancy, and this association was stronger for only young mothers who did not experience nonpartner violence. On the contrary, urban social stress experienced during pregnancy relates to poor physical wellbeing in the postpartum period, but only for young mothers who experienced nonpartner violence. These findings suggest that the relationship between urban social stress and physical wellbeing of

young mothers is complex. It would be expected that the cumulative effects of both urban social stress and nonpartner violence would negatively impact physical wellbeing in both pregnancy and postpartum for young mothers who experienced nonpartner violence, yet our findings did not support this. One possible explanation for this unique finding comes from existing research which suggests being resilient in one domain leaves young mothers with insufficient time for other domains, resulting in poor personal functioning (e.g., poor health).⁵¹ It is possible that resilient young mothers who experienced nonpartner violence focused their efforts on having a healthy baby and maintaining good prenatal care during pregnancy, thus thwarting the impact of urban social stress on her physical wellbeing. However in the postpartum period, her focus may have diverted towards new important demands (e.g., providing optimal care to the infant, improving relationship functioning with father of the baby), leaving little attention for her physical health, which allowed the negative effects of urban social stress to pervade. Future research is needed to understand factors that protect young mothers' physical wellbeing against the negative effects of urban social stress. Further, parenting interventions need to be sensitive to the needs of young mothers who experienced nonpartner violence, as the physical wellbeing of this vulnerable group of young mothers may be more at risk during the postpartum period.

Along with urban social stress, direct exposure to nonpartner violence was associated with poor physical wellbeing during pregnancy. Few studies examine the associations between nonpartner violence and physical health among young mothers; however, our findings are consistent with extant research demonstrating that exposure to nonpartner violence is associated with poor reproductive health for young women.⁵² Similar to other forms of violence, direct exposure to nonpartner violence can lead to physical injury, and alter one's physical functioning. Further, the association between nonpartner violence and physical wellbeing was stronger for IPV-exposed mothers. The cumulative effects of direct exposure to both IPV and nonpartner violence seems to worsen young mother's physical health. Young mothers living in urban areas are at an increased risk of experiencing multiple types of violence,⁵³ and experiencing violence across multiple settings can create an unsafe space and deprive young mothers of a safe haven. Therefore, health promotion interventions targeting young pregnant mothers in urban areas need to be cognizant of the health implications of socio-ecological factors such as nonpartner violence and conduct IPV screenings since IPV-exposed mothers are at greatest risk of poor physical wellbeing during pregnancy.

Finally, it is well documented that IPV is associated with poor maternal health during the postpartum period.³⁶ However, our findings suggest that experiencing IPV relates to better physical wellbeing and this association is stronger for nonpartner violence unexposed mothers. While additional research is needed to explore and understand the mechanisms that underlie this association, it should not be interpreted: as young mothers who experience IPV endorsed good physical health. Instead, it is possible that this association reflects health care utilization behaviors among this sample of young mothers. In particular, young mothers were recruited at hospital-based clinics and actively seeking care. Extant research suggests that women who experience IPV report using medical services more often than women in nonviolent relationships.⁵⁴ It is possible that young mothers already engaged in medical care who also experienced IPV sought additional medical services for IPV-related injuries and those additional services improved women's physical wellbeing. Another possible explanation suggests the association between IPV and physical

wellbeing is indicative of the urban health advantage. While urban areas are comprised of factors that influence poor health outcomes, the urban health advantage states that urban areas also contain characteristics that promote good health.⁵⁵ In particular, urban areas and cities often provide more access to health and medical care.⁵⁵ As a result, this sample of adolescent and young mothers may have lived in urban areas with several options for IPV service providers. Since this sample was already engaged in care, it is possible that young mothers that experienced IPV were able to readily find an IPV service provider and receive the resources necessary to improve their wellbeing.

These significant findings should be interpreted in light of these limitations. First, the data was collected through self-report, which is susceptible to social desirability bias. It should be noted that interview bias was reduced with the incorporation of audio computer-assisted self-interviews⁴⁵ and most violence studies use self-report data.⁵⁶ Second, the prevalence of IPV may be underreported as both female and male partners enrolled in the study were asked violence victimization questions. Thus, some females may have felt uncomfortable to disclose IPV. Third, the study only captured exposure-level data for nonpartner and IPV victimization, thus we are unable to describe the severity and frequency of nonpartner and IPV victimization. Further, IPV victimization was anchored to the aggregated relationship length of the young couples. While some females may have reported more recent IPV (e.g., past-year), we were unable to determine the specific time point within the actual relationship. Fourth, this study only included IPV victimization with the current partner (i.e., father of the child), thus IPV victimization that may have occurred in other concurrent relationships was not captured. While the prevalence of concurrent partners reported by the young mothers was low, it is possible that young mothers in the “No IPV victimization” group may have experienced IPV with another partner. Finally, this study represents a racial and ethnic diverse population of pregnant and parenting adolescent mothers, however these findings may not be generalized to nonparenting adolescents.

CONCLUSIONS

As pregnancy and parenting programs begin addressing the effects of IPV on adolescent health,⁵⁷ it is equally important for these programs and interventions to consider other factors that may contribute to poor health outcomes for adolescent and young mothers, such as urban social stress and nonpartner violence. In particular, stress reduction interventions should help adolescent and young mothers living in urban areas manage urban social stress. Mindfulness-based stress reduction programs have been successful in adult populations,⁵⁸ and it may be useful to expand these programs to young mothers living in urban areas. Further, clinicians and other healthcare professionals should assess whether adolescent and young mothers have experienced IPV with the father of their child and nonpartner violence. Providing an adolescent-friendly healthcare environment may help an adolescent mother identify her primary care needs,⁵⁹ but this type of environment may also be an opportunity to assess exposure to IPV and nonpartner violence. Under the Affordable Care Act, violence screening and counseling is covered by insurance companies and should be implemented in clinical settings.⁶⁰ Early identification of IPV and nonpartner violence will help healthcare professional refer adolescent and young mothers to additional programs and safety planning resources that can help reduce the incidence of violence-related health consequences. Lastly, it is critical for

interventions targeting adolescent and young mothers to be tailored to experiences of IPV and nonpartner violence. A school-based anxiety intervention showed efficacious results including reduced life stress, nonpartner violence victimization, and anxiety for urban African-American youth exposed to nonpartner violence.⁶¹ Additionally, a pilot intervention for young adolescent parents in urban areas focused on promoting conflict resolution skills.⁶² While these interventions show promising results, additional interventions and programs are needed to help violence-exposed adolescent and young mothers in urban areas from pregnancy to the postpartum period.

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