Dual Versus Single Parental Households and Differences in Maternal Mental Health and Child's Overweight/Obesity

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Abstract:

Objectives: Mothers report higher levels of psychological stress than fathers. s. Psychological stress is posited to influence parenting practices that could increase children's obesity risk. However, previous studies have not investigated several aspects of maternal mental health and the moderating role of household structure on children's obesity risk. The objective was to investigate associations of maternal mental health with child obesity risk, and whether these associations differed by household structure (single-parent vs. dual parent/multigenerational). *Methods:* Mothers and their 8–12 year old children (N = 175 dyads) completed baseline questionnaires on mothers' mental health and child anthropometrics. Separate logistic regressions assessed associations of standardized maternal mental health indicators with the odds of child overweight/obesity, controlling for child age, and women's BMI, age, education, employment status, and annual income. Household structure was investigated as a moderator of these relationships. *Results:* There were no statistically significant relationships between maternal mental health characteristics and odds of child overweight/obesity. Among single mothers only, greater anxiety was associated with higher risk of child overweight/obesity [OR (95% CI) = 3.67 (1.27–10.62); p = 0.0163]; and greater life satisfaction was marginally associated with lower risk of child overweight/obesity [OR (95% CI) = 0.44 (0.19–1.01); p = 0.0522]. Mothers' life satisfaction may lower risk for their children's overweight/obesity, whereas higher anxiety may increase this risk, particularly among children living in single-mother households. *Conclusions for Practice:* Future interventions could increase resources for single mothers to buffer the effects of stress and lower pediatric obesity risk.

Article:

Significance

What is already known on this subject? Maternal stress is associated with children not meeting physical activity recommendations, greater TV viewing, and unhealthy dietary intake. Being raised by a single parent is associated with higher obesity risk in children, and worse parenting practices.

What this study adds? We found that positive aspects of maternal well-being, such as greater life satisfaction and self-esteem, may protect against overweight/obesity in their children, particularly in single parent households, which have been viewed as a high-risk group. However, anxiety appears to increase risk for child overweight/obesity, and this effect is stronger in single mothers.

Introduction

Pediatric obesity is a major U.S. public health burden with recent estimates showing that 34% of youth are overweight/obese (Ogden et al. 2015). These you are at greater risk to remain overweight/obese into adulthood (Whitaker et al. 1997), and have a higher risk of cardiometabolic diseases (Koskinen et al. 2014). Thus, it is in the interest of public health to understand factors associated with pediatric obesity that could inform prevention intervention strategies.

Poor parent mental health is associated with increased risk for childhood obesity (Tate et al. 2015). Nationally, over one-third of mothers reported extremely high levels of stress as compared to only one-quarter of fathers (Association 2008). Prospective studies show a positive association between psychological forms of parenting stress and depression in women, which increases the risk for an unhealthy body mass index (BMI) trajectory in children (Shankardass et al. 2014; Tate et al. 2015). Exploration of other mental health indicators in women (e.g., anxiety, self-esteem, and life satisfaction) may reveal novel risk factors for children's obesity risk, but research on these dimensions is scant. Gibson et al. did not find a significant association between maternal self-esteem, anxiety, and stress and child BMI z-score (Gibson et al. 2007). However, other studies have reported that higher levels of self-esteem may buffer psychological stress (Mann et al. 2004) and is associated with healthier parenting practices that may reduce child obesity risk (Gibson et al. 2007). Heterogeneity of results across studies may be influenced by different definitions of psychological stress (e.g., perceived stress in general vs. anxiety vs. multiple mental health indicators), household type (single-parent vs. dual/multigenerational), populations studied (e.g., clinical samples vs. convenience; young children vs. older children), and study designs (e.g., longitudinal vs. meta-analysis).

Mental health characteristics in mothers may be differentially associated with their children's obesity risk depending on external factors such as household structure. Household structure (single-parent vs. two-parent) has been independently associated with both women's mental health and child obesity risk (Chen and Escarce 2010; Gibson et al. 2007), however these may also be interactive factors that synergistically increase child obesity risk. As single parents often face more challenges and fewer resources than parents with partners, they may be more

susceptible to the effects of poor mental health on obesogenic parenting practices. Previous research indicates that single mothers have higher levels of parenting stress (Cooper et al. 2009), which has been associated with lower life satisfaction and higher distress (Crnic and Greenberg 1990). Compromised parenting practices may explain interactions between mothers' mental health and household structure on child obesity risk. Children in single compared to dual parent households watch more TV, consume foods higher in fat and added sugar, and consume fewer fruits and vegetables (Byrne et al. 2011). Various mental health and well-being indicators in mothers such as self-esteem, life satisfaction, anxiety, and stress may be differentially associated with their children's obesity risk, depending on household structure.

The objective of this study was to address a gap in the literature for the moderating role of household structure with mothers' mental health and their children's weight status (normal vs. overweight/obese). We investigated the following hypotheses:

Hypothesis 1. Perceived stress, depression, and anxiety in mothers would be positively associated with odds of their children's overweight/obesity, whereas life satisfaction and self-esteem in mothers would be negatively associated with odds of their children's overweight/obesity.

Hypothesis 2. Household structure (single-parent vs. dual parent/multigenerational) would moderate these associations such that the relationship between maternal mental health dimensions and children's odds of being overweight/obese would be stronger for women in single-parent households.

Methods

Overview

The data came from the baseline assessment of mother–child dyads enrolled in the Mothers' and Their Children's Health (MATCH) study. Details of the study procedures and protocols have been reported elsewhere (Dunton et al. 2015). MATCH is a longitudinal observational study investigating the effects of parenting factors on children's obesity risk spanning 2014–2018.

Participants

Figure 1 presents the recruitment diagram for the study. Study participants were mother–child dyads from the greater Los Angeles area. Participants were recruited between 2014 and 2015 via flyers and research staff presentations at local public elementary schools, after-school programs, and community events. Extra efforts were made to recruit employed women, however low-income or low-education women were not specifically targeted. The study inclusion criteria were: (a) child in the 3rd–6th grade; (b) mother has at least 50% custody; and (c) both woman and child can read English or Spanish. Exclusion criteria were: (a) current use of thyroid or psychological medications by either the woman or child; (b) health issues in the woman or child that limit physical activity; (c) child enrolled in special education programs; (d) pregnancy; (e) either the woman or child currently taking oral or inhalant corticosteroids for asthma; and (f)

women who work > 2 weekday evenings (e.g. between 5 and 9 pm) per week, or 8 + h on any weekend day.
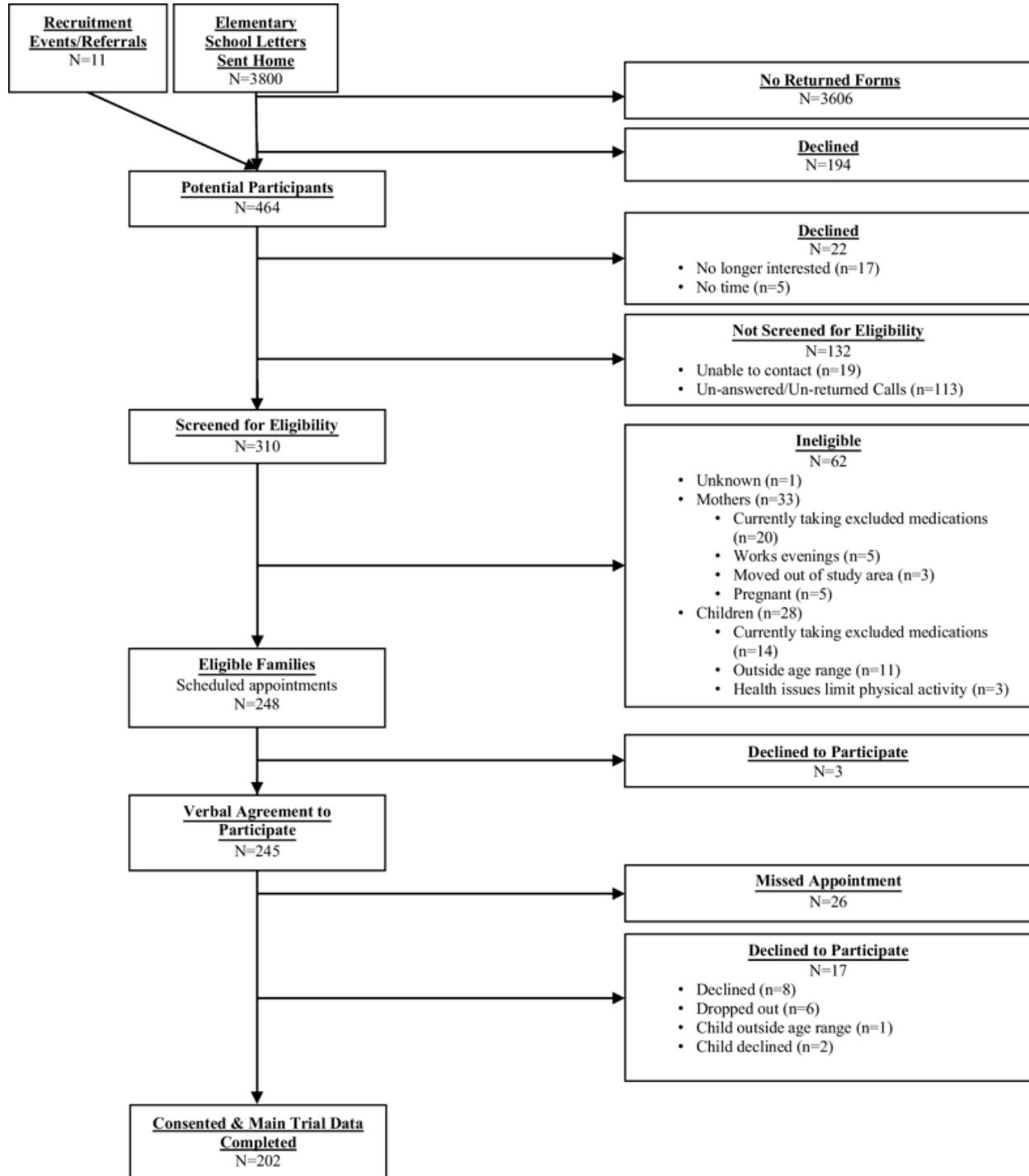

Figure 1. Recruitment CONSORT diagram

Procedures

Women provided informed consent and parental permission, and children provided assent. All procedures were approved by the Institutional Review Boards at the University of Southern California (USC) and Northeastern University. Data collection sessions took place at USC, local schools, or community centers. The measures were delivered in English for children, and English or Spanish for women. Spanish-speaking study staff translated measures from English to Spanish. All disagreements on translations used were resolved through group discussion.

Measures

Perceived Stress. Perceived stress was measured with the Cohen's Perceived Stress Scale (Cohen 1988), a 10-item measure of core dimensions of stress and the perception that demands are greater than available coping resources. For example, the questions asked "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt nervous and "stressed"?". Women rated their answers on a 4-point scale from 1 (never) to 5 (very often). Four items were reverse scored and summed across the remaining items to create the score ($\alpha = 0.84$).

Depression. The 20-item Centers for Epidemiology Scale for Depression (CESD) questionnaire was used to assess depressive symptoms (Knight et al. 1997). For example, the questions asked "I was bothered by things that usually don't bother me" and "I felt that I was not as good as other people". Women rated how often they had felt this way over the past week on a 4-point scale ranging from 1 [rarely or none of the time (< 1 day)] to 4 [most or all of the time (5–7 days)]. Items were summed to create the final score ($\alpha = 0.86$), and 16 indicating the presence of clinically-significant depressive symptoms.

Trait Anxiety. The 20-item Spielberger State-Trait Anxiety Inventory (STAI) was used to assess anxiety (Marteau and Bekker 1992). For example, statements were "I felt pleasant" and "I lacked self-confidence". Women rated how often they had felt this way on over the past week on a 4-point scale ranging from 1 (almost never) to 4 (almost always). Nine items were reverse coded and summed across the remaining items to create the final score ($\alpha = 0.92$).

Life Satisfaction. The 5-item Satisfaction with Life Scale (SWLS) was used to measure women's satisfaction in general (Diener et al. 1985). For example, items were "In most ways my life is close to ideal" and "I am satisfied with life". Women rated how much they agreed/disagreed with each statement on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree), with scores summed to create the final score, and 20 indicating a neutral score on SWLS ($\alpha = 0.90$).

Self-Esteem. The 10-item Rosenberg Self-Esteem Scale (RSES) was used to measure self-esteem (Rosenberg 1965). For example, items were "On the whole, I am satisfied with myself" and "I am able to do things as well as most other people". Women rated how much they agreed/disagreed with each statement on a 4-point scale with ranging from 1 (strongly agree) to 4 (strongly disagree). Five items were reverse coded and the responses were summed to create a final score ($\alpha = 0.88$).

Weight Status. Women's and children's height (cm) and weight (kg) were collected in duplicate and averaged. BMI (kg/m^2) was computed from the height and weight measurements. Weight status category was determined for children using the CDC age- and sex-adjusted BMI percentiles (Kuczmarski et al. 2000). Healthy weight was defined as a BMI between the 5th and < 85th percentiles, and overweight/obese was defined as a BMI ≥ 85th percentile.

Demographics. Women completed questionnaires on child age and race/ethnicity, and reported on their own age, annual income for the prior 12 months, employment status, education level, and household structure. A subset of women (N = 63) reported annual income from 2 years ago; however removing them did not change the final results, and therefore they were included in the analytical sample. Annual household income quartiles ($0–$35,000; $35,001–$75,000; $75,001–$105,000, and $105,000 +) were calculated from the total sample and used in regression analyses. For the purposes of these analyses, women's age and BMI were centered, and education (college or higher, no college), employment status (employed fulltime vs. not) and household structure (single-parent household, dual-parent/multigenerational household) were dichotomized.

Statistical Analyses

Statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC). Bivariate correlations between all maternal mental health dimensions and child BMI z score were assessed. Potential covariates (women's age, income quartile, education, household size, and child age and sex) were screened to determine if there were any significant associations with child BMI z-scores. Women's BMI and employment status, and child age were also included as covariates because prior research indicates they are associated with child overweight/obesity (Anderson et al. 2003; Gibson et al. 2007). Annual household income quartile ($r = -0.20$, $p = 0.007$) and women's educational level ($r = -0.26$, $p = 0.0006$) were significantly associated with child BMI z-score. Women's age was significantly associated with employment ($r = -0.20$, $p = 0.0090085$), education ($r = 0.28$, $p = 0.0002$), and income ($r = 0.25$, $p = 0.0007$) and therefore was included in final models.

To better compare findings across the different maternal mental health scales, the scores were standardized. Separate logistic regression analyses examined cross-sectional associations between each maternal mental health dimension and the odds of child overweight/obesity, adjusting for covariates. The following covariates were grand mean centered: women's BMI and age, and child age, and women's employment status, income quartile, education level, and household structure. Two-way interaction terms between recoded binary household structure (i.e., single parent vs. dual/multigenerational household) and each maternal mental health dimension were entered into separate models to determine whether the relationship between maternal mental health and the odds of child overweight/obese differed by household structure. If the p-value for the interaction term was ≤ 0.10, then the results were stratified by household structure. All models controlled for the main effect of each moderator and included relevant covariates. Because we conducted several regression analyses, we examined the false discovery rate (FDR) using the Benjamini-Hochberg method (Benjamini and Hochberg 1995) to assess type 1 error.

Results

Data Availability and Participant Characteristics

Figure 1 presents the CONSORT diagram for the study. At baseline, 202 mother–child dyads enrolled in the study, and 27 had missing data. Of these, 24 were missing a single variable of interest, and three were missing multiple variables. The analytical sample consisted of 175 dyads with complete data. Excluded participants did not differ from those with complete data on maternal age or BMI, child BMI percentile, or single parent or working status. Table 1presents the characteristics of women and children included in the final analytical sample. Women's mean age was 40.77 (SD = 6.33) years, 60.00% were employed full-time, and 77.71% were in a dual-parent or multigenerational household. Children were between 8 and 12 years old with a mean age of 9.57 (SD = 0.92) years, 49.71% were boys, and 36.57% were overweight or obese.

Table 1. Maternal baseline sample characteristics (N = 175)

Mother variable	Mean (SD)
Age (years)	40.77 (6.33)
BMI (kg/m^2)	28.23 (6.31)
Household size[a]	4.49 (1.47)
Number of children in house	2.30 (0.99)
Perceived Stress Scale (PSS)	14.73 (5.51)
Depression (CESD)	7.46 (7.28)
State Trait Anxiety Inventory (STAI)	36.98 (9.21)
Satisfaction with Life Scale (SWLS)	24.75 (6.73)
Self-Esteem Scale (RSES)	33.10 (4.88)
	N (%)
Ethnicity	
Hispanic	85 (48.57)
Non-Hispanic Black	23 (13.14)
Non-Hispanic White	50 (28.57)
Other	17 (9.72)
Race	
Black	28 (16.00)
White	78 (44.57)
Other	69 (39.43)
Weight category	
Underweight	3 (1.71)
Normal	57 (32.57)
Overweight	59 (33.71)
Obese	56 (32.00)
College graduate	107 (61.14)
Work full-time	105 (60.00)
Single parent household	39 (22.29)
Income quartiles	
$0–$35,000	41 (23.43)
$35,001–$75,000	53 (30.29)
$75,001–$105,000	36 (20.57)
$105,001 +	45 (25.71)
Child variable	**Mean (SD)**
Age (years)	9.57 (0.92)
BMI percentile	62.93 (29.32)

	N (%)
Ethnicity	
Hispanic	96 (54.86)
Non-Hispanic Black	25 (14.29)
Non-Hispanic White	45 (25.71)
Other	9 (5.14)
Race	
Black	34 (19.43)
White	83 (47.43)
Other	58 (33.14)
Sex (boys)	87 (49.71)
Weight category	
Underweight	3 (1.71)
Normal	108 (61.71)
Overweight	36 (20.57)
Obese	28 (16.00)

There were 202 dyads enrolled at baseline. Of these, 24 were missing a single variable of interest: child BMI percentile (N = 1), maternal education (N = 6), income (N = 1), maternal employment status (N = 3), maternal perceived stress (N = 3), maternal anxiety (N = 7), and maternal self-esteem (N = 3). In addition, 3 were missing multiple variables: both maternal anxiety and self-esteem scores (N = 1); maternal employment status, anxiety, life satisfaction, and self-esteem (N = 1); and both maternal anxiety and life satisfaction scores (N = 1). The analytical sample consisted of 175 dyads with complete data

[a]N = 173; [c]N = 172 (N = 64 reported income past 2 years and N = 111 reported income in the past year)

Table 2. Logistic regression results of maternal mental health and well-being characteristics predicting odds of child overweight/obesity (N = 175)

Maternal variables	Covariate-adjusted model[a]		Heterogeneity by household structure				
	OR (95% CI)	Main effects P value	Interaction term P value	FDR adjusted P value	OR (95% CI)	P value	FDR adjusted P value
Perceived stress	1.02 (0.71–1.48)	0.8882	0.1909				
Depression	1.20 (0.82–1.74)	0.3535	0.2720				
Anxiety	1.29 (0.89–1.88)	0.1825	**0.0269**	0.1345	**Single parent: 3.67 (1.27–10.62)**	**0.0163**	**0.0652**
					Non-single parent: 1.01 (0.66–1.55)	0.9656	
Life satisfaction	0.85 (0.58–1.25)	0.3993	**0.0677**	0.1693	**Single parent: 0.44 (0.19–1.01)**	**0.0522**	0.1044
					Non-single parent: 1.04 (0.67–1.62)	0.8687	
Self-esteem	0.76 (0.52–1.11)	0.1500	0.2167				

$P < 0.05$ are given in bold

FDR False Discovery Rate

[a]Models adjusted for grand mean centered child age, grand mean centered maternal age and BMI, income quartile ($0–35,000; $35,001–$75,000; $75,001–$105,000; and $105,001 +), college education (0 = no, 1 = yes), and employment status (0 = not fulltime, 1 = fulltime), household structure (0 = dual-parent/multigenerational, 1 = single-parent)

Descriptive Statistics

Nineteen women (10.86%) screened positive for possible clinically-significant depressive symptoms (M = 7.46; SD = 7.28). Thirty-four women (19.43%) scored below 20 on the Satisfaction with Life Scale, indicating low levels of life satisfaction (M = 24.75; SD = 6.73). The mean anxiety score was 36.98 (SD = 9.21) out of 80, indicating that women had low trait anxiety levels. The mean perceived stress score was 14.73 (SD = 5.51) out of 30, indicating moderate levels of stress. The mean self-esteem score was 33.10 (SD = 4.88) out of 40, indicating that in

general, women had high levels of self-esteem. All mental health and well-being characteristics demonstrated a fair degree of inter-individual variability.

Bivariate correlations between women's mental health characteristics, child BMI z-score, and demographic characteristics are presented in Supplemental Table 1. Child BMI z-score was negatively correlated with women's life satisfaction (r = − 0.23, p = 0.002), women's education (r = − 0.26, p < 0.001), and income quartile (r = − 0.20, p = 0.007); and positively correlated with women's depression (r = 0.16, p = 0.032), women's BMI (r = 0.31, p < 0.001), and living in a single parent household (r = 0.30, p < 0.001).

Associations Between Maternal Mental Health and Well-Being with Risk of Child Overweight/Obesity. Table 2 presents the results of logistic regressions to test the association between maternal mental health variables with odds of their children being overweight/obese. In adjusted analyses, there were no statistically significant associations between maternal mental health dimensions and odds of child overweight/obesity.

Associations Between Maternal Mental Health and Well-Being with Risk of Child Overweight/Obesity by Household Structure
After adjusting for covariates, being a single parent was associated with marginally greater odds of the child being overweight/obese [OR (95% CI) = 2.07 (0.82–5.20), p = 0.1227] and moderated the associations of anxiety and life satisfaction with odds of a child being overweight/obese (Table 2). For mothers in single-parent households, higher levels of anxiety were associated with increased odds of overweight/obesity in their child [OR (95% CI) = 3.67 (1.27–10.62), p = 0.0163; Fig. 2a], but this association was not significant for mothers in dual/multigenerational households. Additionally, for mothers in single-parent households, greater life satisfaction was associated with lower odds of child overweight/obesity [OR (95% CI) = 0.44 (0.19–1.01), p = 0.522; Fig. 2b] but not for mothers in dual/multigenerational households. After FDR adjustment, only maternal anxiety was marginally associated with increased odds of child overweight/obesity.
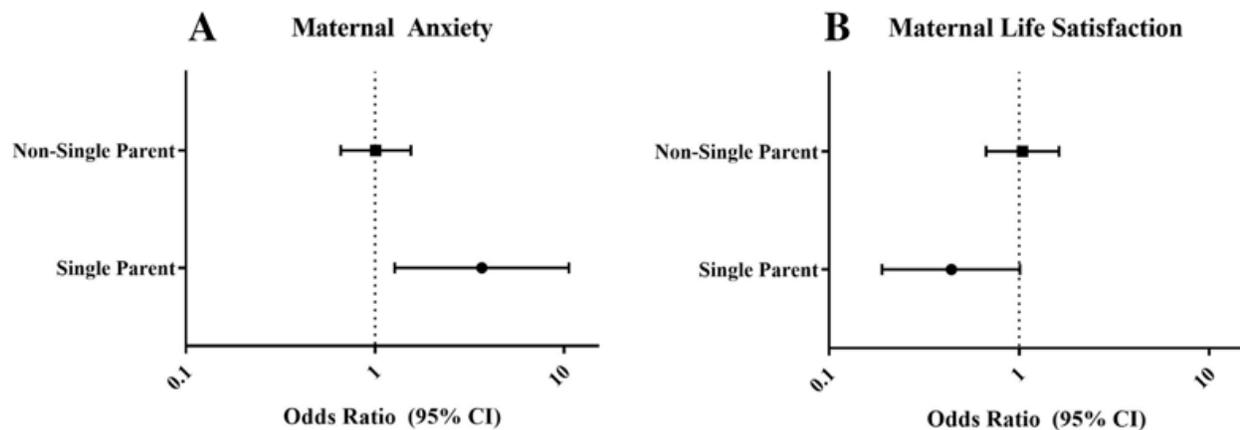

Figure 2. Odds of child overweight/obesity by household structure

Additional post-hoc analyses were performed to investigate the relationships between maternal mental health characteristics and child obesity odds in normal weight vs. obese children

(N = 139). Results from the reduced sample did not differ from those of the full sample, and these results are presented in Supplemental Tables 2 and 3.

Discussion

We investigated the role of multiple maternal mental health dimensions and risk of child overweight/obesity in this cross-sectional analysis of 175 mother–child dyads. Hypothesis 1 was not supported, as none of the maternal mental health dimensions were significantly associated with odds of child overweight/obesity. Hypothesis 2 was partially supported, as women in single-parent households had stronger associations between anxiety and life satisfaction and odds of child overweight/obesity.

Single-parents with higher anxiety had a higher risk for child overweight/obesity compared to dual/multigenerational households; albeit this relationship was only marginally significant after the FDR adjustment. Gibson et al. reported that being a single parent increased risk for child's classification as overweight/obese even when multiple aspects of maternal mental health had no association with child's weight (Gibson et al. 2007). Being a single mother may present more vulnerability to the potential effects of anxiety on children's risk of obesity (Gustafson and Rhodes 2006). Children in single-parent households typically consume more prepared foods, consume more total and saturated fat, have less access to fruits and vegetables, and are permitted to watch more TV than children from dual-parent households (Huffman et al. 2010), all behaviors which may increase the risk of obesity. In addition, maternal anxiety may also have a greater impact on children's risk of obesity among single mothers because they may experience less of a support system to buffer these negative effects on health risk. Indeed, single parents tend to report less social support (Cairney et al. 2003) and more parenting stress (Cooper et al. 2009). These factors have all been associated with poor energy balance behaviors in children of single-parent households (Gundersen et al. 2008). Alternatively, maternal mental health may influence the mental health of their child, which may increase risk of becoming overweight and obese. Mothers of overweight/obese children report higher parenting stress and maternal distress (Moens et al. 2009), and their children report greater anxiety and depression themselves, and have more behavioral problems (BeLue et al. 2009) compared to their normal weight counterparts. These patterns suggest that mothers may experience higher anxiety from parenting an overweight/obese child, which may be exacerbated in single-parent households where there is less support for the mother. Thus, aspects of maternal mental health and household type may work synergistically, leading to increased child obesity risk.

Among single parents, those with higher life satisfaction were less likely to have an overweight/obese child than those with lower life satisfaction (before FDR adjustment). Although being a single-parent may be a risk factor for pediatric obesity due to the reasons described above (e.g., consume more prepared foods, consume more total and saturated fat, have less access to fruits and vegetables, and are permitted to watch more TV than children), these effects appear to be buffered in women with higher levels of life satisfaction. Having higher life satisfaction due to reasons such as working a meaningful job (Judge and Watanabe 1993), having work-life balance (Haar et al. 2014), financial security, or having close friends and family members (Wan et al. 1996) may attenuate the difficulties associated with single-parenting,

providing the motivation and support needed to engage in healthful weight-related parenting practices to reduce obesity risk in children.

There are several mechanisms that could explain the relationship between women's mental health dimensions and childhood overweight/obesity risk. Parent stress and the continuum of mental health functioning (from minimal to low-moderate) may compromise energy balance-related parenting practices (e.g. modeling physical activity, meeting dietary guidelines for fruit and vegetable intake) and increase children's overweight/obesity risk (Lampard et al. 2014). Also, maternal mental health may affect children's mental health and subsequent obesity risk. Maternal depression has been associated with increased risk of depressive symptoms in children (Slykerman et al. 2015), which in turn has been associated with increased risk for poor energy balance behaviors and obesity risk later in life (Stunkard et al. 2003).

Taken together, these findings have implications for future intervention strategies. For example, primary care clinics could screen women for poor mental health and provide recommendations for parenting practices that can decrease risk for child overweight/obesity. Prevention intervention strategies, such as quality of life therapy, parenting programs (Barlow et al. 2002), and strengthening social networks to increase perceived social support (Kawachi and Berkman 2001), could also boost women's life satisfaction, resilience, and buffer anxiety, which could reduce pediatric obesity risk. If future studies extend this result and suggest a causal link between women's mental health dimensions, single-parent household type, and their interaction with child obesity risk, then intervention strategies may also need to focus on improving and supporting maternal mental health, particularly in single parents, as a strategy for reducing child overweight/obesity risk.

Strengths and Limitations

Among the study strengths are the multiple measures of women's mental health, child weight status measured by trained research assistants, and well-characterized demographic factors for both women and children. Another limitation is that the sample size did not permit us to make a distinction between dual parent and multigenerational households. However, this should be considered in future studies as children living in multigenerational households may be at increased risk for obesity (McKinney 2015). Additional study limitations include cross-sectional analyses, a self-report assessment of women's mental health dimensions (versus a psychiatric interview), a relatively small sample size that may influence our ability to detect significant associations, and investigating several statistical models which could increase the type 1 error rate. The lack of significant findings after FDR adjustment may indicate a lack of power to detect observed relationships. Post-hoc power calculations showed that the power to detect significant associations ranged from 0.06 for perceived stress to 0.49 for self-esteem. Thus, our null findings should be interpreted with caution and replicated in a larger sample. The number of significant findings may also be inflated due to the high correlations among several of the predictor variables. However, the results differed between positive (e.g. life satisfaction) and negative (e.g. anxiety) dimensions of women's self-reported mental health, suggesting that while highly correlated, these dimensions have different relationships with child adiposity. Furthermore, study findings may not be generalizable to all women in Los Angeles County, because compared to all women in Los Angeles County, our sample had higher rates of being single parents, having a

household income > 200% Federal Poverty Level, being employed (fulltime or part time), and having a college or post-graduate degree.

Conclusions and Future Directions

Childhood obesity is not caused by a single factor, but most likely results from the interplay of several factors. Our results expand previous knowledge about parental mental health and risk of child obesity by examining multiple dimensions of women's mental health and by investigating the interaction with household structure. Future research should assess whether these cross-sectional relationships remain stable over time, or if cumulative effects are observed. Future work should also assess whether parenting practices mediate associations between maternal mental health child obesity risk.

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Conflict of interest

The authors declare no conflict of interest.

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