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ORIGINAL PAPER

Maternal Harsh Parenting, SES, and Young Children's Sleep

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Abstract

There is a need to better understand the influence of daytime parenting behaviors on children's sleep. We investigated relations between maternal harsh parenting and young children's sleep and consistent with health disparities and cumulative risk perspectives, socioeconomic status was considered as a moderator of these associations. Participants were 172 mothers of children between the ages of 2 and 5 years (mean age of children was 3.30 years) from diverse ethnic (47% of children were White/European American, 24% were Hispanic/Latino, 29% reported other ethnicities) and socioeconomic backgrounds. Mothers reported on children's sleep/wake problems (insufficient sleep duration, night wakings, daytime sleepiness) and their own harsh parenting behaviors. After controlling for several covariates, more maternal harsh parenting was related to greater daytime sleepiness among children. Associations between maternal harsh parenting and insufficient sleep duration and night wakings were significant for children from lower socioeconomic backgrounds. Results add to the growing literature that has considered children's sleep in the family context and highlight the importance of contemporaneous considerations of the parenting and socioeconomic contexts.

Keywords Harsh parenting · Children's sleep · Socioeconomic status · Health disparities · Family stress

Highlights

- Relations between maternal harsh parenting and young children's sleep were examined among families from diverse SES homes.
- Mothers of 2- to 5-year-old children reported on their own harsh parenting and children's sleep.
- Harsher maternal parenting and children's sleep problems were related, especially for those from lower SES backgrounds.
- Attempts to improve children's sleep, especially in low SES contexts, may benefit from considering harsh parenting.
- Results illustrate the importance of considering children's sleep within the family and broader social context.

The prevalence of *sleep/wake problems* (e.g., insufficient sleep duration, night wakings, daytime sleepiness) in early childhood is of concern. About 40% of young children struggle to obtain optimal sleep (Archbold et al., 2002) and sleep/wake problems are common reasons parents seek professional help (Mindell & Owens, 2015). Early identification is important because sleep/wake problems can compromise socioemotional functioning (Conway et al., 2016; Jansen et al., 2011), behavioral adjustment (Quach et al., 2018), physical health (for a review see Chaput et al., 2017), and neural development (for a review see Gómez and Edgin (2015)). Studies of children's sleep in the family context are on the rise (El-Sheikh & Kelly, 2017) and daytime parenting influences children's sleep (Bernier et al., 2014; Tikotzky, 2017). For example, maternal insensitivity (Tetreault et al., 2016), parental permissiveness (Tyler et al., 2019), and inconsistency in parenting practices (Staples et al., 2015) may all confer risk for sleep/wake problems. Despite these advances, other parenting behaviors that may be influential have received limited attention. Few studies have considered harsh parenting in relation to sleep in early

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childhood. Harsh parenting can be distressing for young children (Scaramella et al., 2008) and its consideration holds promise for providing additional understanding of sleep in the family context.

The term "harsh parenting" has been used to reference a broad range of negative behaviors including coercion, over-reactivity, negative emotional expressions, and acts of physical discipline (Chang et al., 2003). Our definition includes acts of hostility and physical control that are common in community samples of young children (Parent & Forehand, 2017). *Hostility* refers to over controlling, parent-centered harshness, and negative coercive processes such as making threats, yelling, and exploding in anger. *Physical control* includes physical punishment both generally and out of anger and frustration (e.g., spanking while extremely angry; Parent & Forehand, 2017). As young children become increasingly active, discipline becomes a particularly salient issue (Windham et al., 2004) and harsh parenting may occur (Kim et al., 2010). Multiple studies have shown that many young children experience some level of harshness from parents (Finkelhor et al., 2019; Kim et al., 2010; Straus & Field, 2003). Frequently occurring harsh parenting may jeopardize children's development (Sege & Siegel, 2018) and is an established correlate of negative outcomes across emotional, behavioral and cognitive domains (Brody et al., 2014; Ferguson, 2013; Mackenbach et al., 2014; McKee et al. (2007); Mills-Koonce et al., 2016). However, other facets of development have received relatively less attention, including sleep, which is associated with family stress (El-Sheikh & Kelly, 2017). Given the prevalence of harsh parenting and the role sleep plays for healthy development, explicating relations could carry important implications for children's well-being.

Conceptual models suggest plausible mechanisms linking harsh parenting and children's sleep/wake problems. According to the opponent-process theory on sleep (Dahl, 1996), sleep and vigilance are opponent processes; high quality sleep is obtained when arousal and vigilance are lowered. Evolutionary perspectives suggest that the broader social environment, including the family context, is influential in creating sleep conditions that promote or compromise a sense of security that can lead to a reduction in arousal (Worthman & Melby, 2002). Thus, as integral aspects of the family context, parenting behaviors may influence children's sleep. Parenting characterized by warmth and sensitivity has been shown to promote children's sleep (Bernier et al., 2014; Tetreault et al., 2016). Conversely, the presence of negative parenting behaviors may confer risk. Harsh parenting may be distressing and interfere with the reduction in vigilance and arousal necessary to achieve optimal sleep (Brooker & Buss, 2014; Kelly & El-Sheikh, 2014; Scaramella et al., 2008).

Much of the research to consider the effects of harsh parenting on children's sleep has focused on clinical samples of children who experience abuse. In those studies, sleep/wake problems, including taking longer to fall asleep and night wakings, were evident (see Glod, 2011 for a review). Surprisingly, little attention has been given to community samples and of existing work, most has focused on middle childhood (e.g., Bell & Belsky, 2008). For example, parenting characterized by blame and physical punishment was associated concurrently with greater parent-reported sleep problems among school-aged children (a general measure of sleep/wake problems was used; Liu et al., 2000). In another study of school-aged children, harsher parenting was associated cross-sectionally with greater self-reported sleep/wake problems and poorer actigraphy-derived sleep quality (El-Sheikh et al., 2012). In a longitudinal study, school-aged children who experienced harsh physical discipline had poorer actigraphy-derived sleep efficiency and more wake episodes, but not shorter sleep duration one year later (Kelly et al., 2014). Of the few studies to consider early childhood, findings are mixed. Greater parental marital conflict at 9 months of age predicted more parent-reported child sleep/wake problems (a general measure of multiple sleep/wake problems) at 4.5 years of age through the indirect effect of fathers' harsh parenting at 2 years of age (Rhoades et al., 2012). However, mothers' harsh parenting was not related to children's sleep (Rhoades et al., 2012). Among 4- to 6-year-old Chilean children, maternal harsh parenting was concurrently related to a general measure of parent-reported child sleep/wake problems (Berthelon et al., 2020).

Individual differences are likely to exist in associations between harsh parenting and children's sleep; however, few studies have investigated risk and resiliency factors. A developmental ecological systems perspective adapted for sleep indicates multiple levels of influence and that relations between family functioning and sleep should be considered in the context of the broader sociocultural milieu (El-Sheikh & Sadeh, 2015). Along this line, socioeconomic status (SES) has been examined as a moderator of relations between family adversity and children's sleep (El-Sheikh & Kelly, 2017). The health disparities (Buckhalt, 2011; Marmot et al., 1997) and cumulative risk perspectives (Evans & Kim, 2013) propose co-occurring phenomena for those facing low SES conditions and have guided much of this work. The health disparities perspective suggests that individuals from low SES backgrounds may be more impacted by adverse conditions due to the excessive burden of multiple stressors and relative lack of economic, social, and cultural capital resources. The cumulative risk perspective contends that human coping abilities are often effective when faced with a single stressor but can become overwhelmed when the stress response system faces multiple stressors, such as through the combination of low SES living conditions and family adversity (Evans, 2003; Evans

& Kim, 2013). Exposure to chronic stress, particularly during childhood, undermines the ongoing development of self-regulation and effective coping mechanisms to deal with life stressors (Evans, 2003; Evans & Kim, 2013).

Investigations have considered SES as a moderator of relations between family adversity and children's sleep with findings supportive of health disparities and cumulative risk perspectives. Relations between frequent exposure to parental marital aggression and disruption in some sleep/wake parameters were only significant for children from lower SES backgrounds (Kelly & El-Sheikh, 2011). Similarly, only for children from lower SES backgrounds was poorer sleep quality an intervening variable of relations between children's emotional insecurity about the marital relationship and their academic performance (El-Sheikh et al., 2007). The examination of relations between parental problem drinking and children's sleep/wake problems have yielded similar SES differences (Kelly and El-Sheikh (2019). In a study to consider the parent-child relationship, several parent functioning variables (perceived social support, parenting stress, marital satisfaction) interacted with SES in relation to parent-reported sleep/wake problems among 2-year-olds (Bernier et al., 2013). The relations between parent functioning and children's sleep/wake problems were in the expected directions and several were only significant for those from lower SES homes. Finally, the effect of maternal spanking at age 5 on externalizing problems at age 9 was only significant for children from lower income homes (Lee et al., 2020). Building on this work, relations between harsh parenting and sleep/wake problems may be particularly evident for children from lower SES backgrounds.

Current Study

To fill a gap in the broader literature, we investigated associations between harsh parenting and sleep/wake problems in early childhood using a non-clinical sample and considered SES as a moderator. The sample included a high representation of economic adversity that allowed for adequate testing of research questions. We examined mothers' harsh parenting. Compared to fathers, some past research has found that mothers' harsh parenting may influence children's emotion regulation more strongly, which has implications for sleep (e.g., Chang et al., 2003); the consideration of mothers is thus important. Maternal harsh parenting was measured along a continuum and in relation to other families in the sample.

Sleep is a complex and multi-faceted construct (Sadeh, 2015). The assessment of various parameters is imperative for elucidating the facets of sleep maternal harsh parenting may impact (El-Sheikh and Buckhalt (2015). Using an established measure, mothers reported on their perceptions of three primary sleep parameters: *insufficient sleep duration* (e.g., child does not receive enough sleep), *night wakings* (e.g., frequency of waking at night), and daytime *sleepiness* (e.g., difficulty staying awake during daytime activities). Sleep was measured along a continuum. SES was assessed using income-to-needs ratio, an established variable that taps into the availability of material resources and takes into account family size (Braveman et al., 2005; Farah, 2017). Past work has demonstrated that maternal stress is a correlate of harsh parenting (Belsky, 1993) and children's sleep (Bernier et al., 2013) and thus, we controlled for it to reduce the possible influence of third variables. We also controlled for children's age, sex, and ethnicity given their known associations with sleep (Archbold et al., 2002; Grandner et al., 2016). We hypothesized that harsher maternal parenting would be related to more child sleep/wake problems and it was expected that these relations would be more evident for those from lower SES backgrounds.

Method

Participants

Participants were 172 mothers from a semi-urban community in the Southwestern United States. All mothers had a child between the ages of 2 and 5 years (*M* age of children = 3.30 years, *SD* = 1.00; 48% were girls). In terms of children's ethnicity, 56% were White/European American, 24% were Hispanic/Latino, 8% were Native American, 4% were Asian, and 2% were Black/African American. In addition, 5% were of multiple ethnicities (e.g., Hispanic/Latino and Native American) and 1% reported other ethnicities (e.g., Pacific Islander). The average age of mothers was 33.42 years (*SD* = 5.64). Further, 73% of the mothers reported being married, 20% had a romantic partner, and 7% reported not having a partner. Average annual family income was $76,973.75 (*SD* = $81,562.35; range: $5,000 to $800,000; *Mdn* = $64,000). Because of the study's focus on sleep/wake problems in the non-clinical range, families were not eligible to participate if the mother reported that the child had been diagnosed with a sleep disorder. Exclusion criteria also included child chronic illness and mothers were required to have resided with their child. These criteria were implemented to reduce potential confounds.

Procedure

Mothers were recruited through flyers posted in local public venues and online resources (Facebook, Craigslist). Those

who were interested were asked to contact our on-campus lab via telephone for screening. Of mothers who qualified, they were given the option of being emailed an electronic link or visiting our lab to complete the online questionnaires. Few mothers visited our lab to participate ($n = 4$). Prior to completing the questionnaires, mothers were presented an online consent form; this included clicking a button labeled "Agree to Participate." Following participation, mothers visited our lab to receive compensation ($25 gift card to a local retailer). Approval from the institution's internal review board was obtained.

Measures

Socioeconomic status

Socioeconomic status was measured using income-to-needs ratio; this is a standard measure of a family's economic circumstances that accounts for family size (U.S. Department of Commerce, 2020; http:www.commerce.gov). It was computed by dividing annual family income by the federal poverty threshold for that family size (e.g., in 2018, a family of four with an annual income at or below $25,465 was considered to be living in poverty). Families who received an income-to-needs ratio <1 were considered to be living in poverty (16% in the current study), 1–2 living near the poverty line (27% of families), 2–3 lower middle class (18% of families), and >3 middle class standing (39% of families). The average income-to-needs ratio was 2.96 ($SD = 2.28$; $Mdn = 2.55$).

Maternal harsh parenting

Mothers reported on their own harsh parenting in the past two months using the Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2017). The MAPS assesses multiple parenting behaviors and practices with young children. The hostility subscale and physical control subscale were included. The *hostility* subscale includes 7 items that assess controlling and harsh behaviors such as yelling, making threats, and exploding in anger. Sample items include "I yell or shout when my child misbehaves" and "I explode in anger toward my child." The *physical control* subscale includes 4 items that assess the use of physical discipline tactics in general or out of frustration. Sample items include, "I use physical punishment as a way of disciplining my child" and "I spank my child when I am extremely angry." A 5-point Likert response system was used ranging from 1 (*never*) to 5 (*always*). For each subscale, items were summed. The hostility and physical control subscales were correlated ($r = 0.48$, $p < .001$) and mean composited to create the maternal harsh parenting variable. The MAPS was adapted from several well-established parenting scales and has demonstrated test-retest reliability and initial longitudinal support for the validity of its subscales (Parent & Forehand, 2017). Confirmatory factor analyses have also yielded support for the hostility and physical control subscales (Parent & Forehand, 2017). In the current study, internal consistency was good (Cronbach's alpha = 0.81 for the hostility subscale and .87 for the physical control subscale). In preliminary analyses, we considered broadband negative parenting, which is composed of the hostility and physical control subscales as well as a third subscale called *lax control*; it was not significantly related to children's sleep (neither directly nor in moderation analyses) and was not retained.

Children's sleep/wake problems

Mothers reported on their perceptions of children's sleep/wake problems in the past week using the Children's Sleep Habits Questionnaire (CSHQ; Owens et al., 2000). Three subscales were relevant: the 3-item *sleep duration* subscale (sample item: "Child sleeps too little"), the 3-item *night wakings* subscale (sample item: "child awakens more than once during the night"), and the 8-item *daytime sleepiness* subscale (sample item: "child has appeared very sleepy or fallen asleep while watching TV"). The CSHQ has demonstrated concurrent validity with early childhood samples (Goodlin-Jones et al., 2008) as well as good internal consistency (Tyler et al., 2019), and test-retest reliability (Owens et al., 2000). In the current study, internal consistency was good (Cronbach's alpha = 0.80 for the sleep duration subscale, 0.75 for the night wakings subscale, and 0.79 for the sleepiness subscale). Higher scores on each subscale reflect greater sleep/wake problems.

Maternal stress

Mothers completed the well-established 10-item Perceived Stress Scale (PSS; Cohen et al., 1983). The PSS assessed how often women felt or thought a certain way in the past month using a 5-point rating scale (sample items: "could not cope with all things you had to do" and "difficulties were piling up so high that you could not overcome them"). The PSS has demonstrated good psychometric properties including convergent and divergent validity (Roberti et al., 2006). Internal consistency was good (Cronbach's alpha = 0.89). Higher scores reflect more perceived stress.

Plan of Analysis

We assessed relations between maternal harsh parenting and children's sleep (insufficient sleep duration, night wakings, daytime sleepiness). Because different sleep/wake problems co-occur (Kelly et al., 2014), we examined each sleep parameter simultaneously to better ascertain the unique

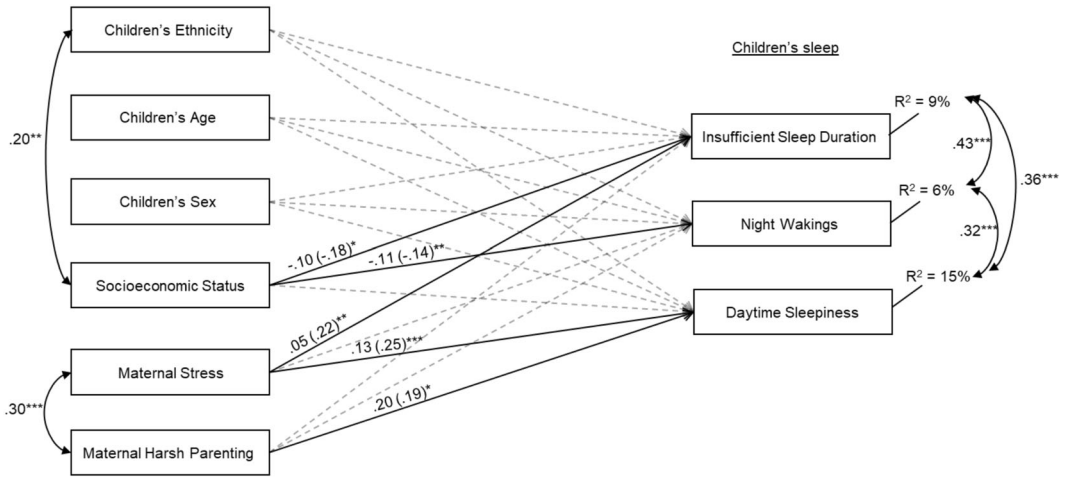

Fig. 1 Examination of relations between maternal harsh parenting and children's sleep/wake problems. Model fit: χ^2 (13) = 15.29, $p = 0.29$; CFI = 0.98; RMSEA = 0.03, $p = 0.65$. Statistically significant lines are solid and non-significant lines are dotted. Unstandardized and standardized coefficients (in parentheses) are provided. Exogenous variables that were significantly related were allowed to covary (standardized coefficients are provided). Children's ethnicity (1 = White, 0 = other) and sex (1 = boys, 0 = girls) were dichotomized. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

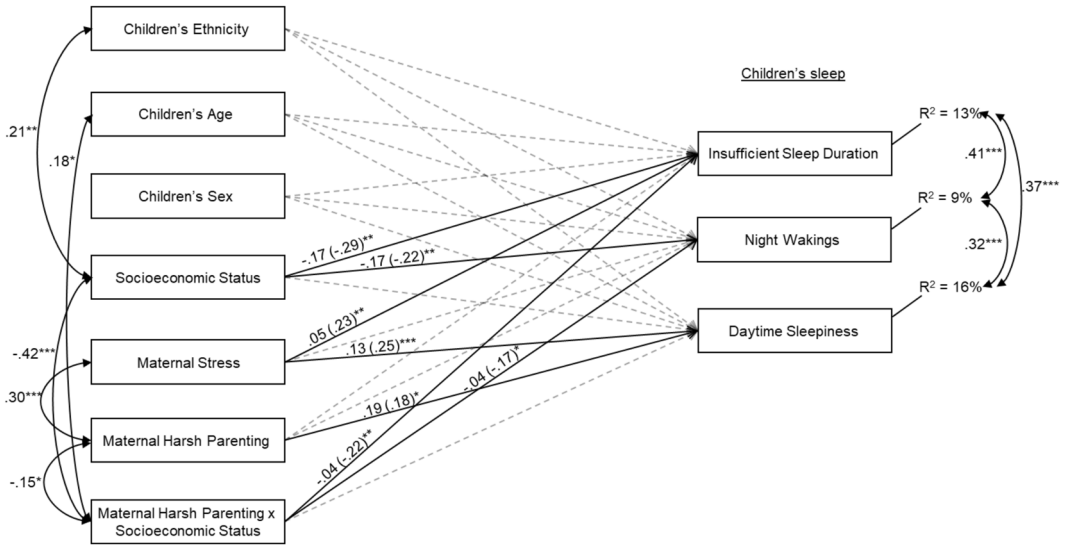

Fig. 2 Examination of socioeconomic status as a moderator of relations between maternal harsh parenting and children's sleep/wake problems. Model fit: χ^2 (15) = 15.20, $p = 0.51$; CFI = 1.00; RMSEA = 0.00, $p = 0.84$. Statistically significant lines are solid and non-significant lines are dotted. Unstandardized and standardized coefficients (in parentheses) are provided. Exogenous variables that were significantly related were allowed to covary (standardized coefficients are provided). Children's ethnicity (1 = White, 0 = other) and sex (1 = boys, 0 = girls) were dichotomized. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

association between maternal harsh parenting and each sleep variable. We fit path models instead of using multiple linear regression, given their capability to simultaneously assess multiple outcomes (see Fig. 1). We used $\Delta\chi^2$ tests to determine whether the estimated paths between maternal harsh parenting and children's sleep improved model fit. A change in model fit lends additional support for the inclusion of the estimated path. Children's age, sex, ethnicity, SES, and maternal stress were controlled given their known associations with children's sleep. Children's age, maternal stress, harsh parenting, and the sleep parameters were treated as continuous variables whereas sex (1 = boy, 0 = girl) and ethnicity (1 = White, 0 = other) were dichotomized. To elucidate whether the nature of relations between maternal harsh parenting and children's sleep were best characterized as linear, we assessed for curvilinear associations in preliminary analyses; none were detected.

Next, an interaction term was added to assess whether SES (indexed by income-to-needs ratio) moderated relations between maternal harsh parenting and children's sleep (see Fig. 2). Significant interactions were plotted using Preacher et al.'s (2006) online interaction tool; this tool has

Table 1 Mean, Standard Deviations, and Correlations among Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Children's ethnicity	–								
2. Children's age	0.07	–							
3. Children's sex	−0.07	−0.06	–						
4. Socioeconomic status	0.20**	−0.07	−0.14	–					
5. Maternal stress	0.06	0.10	-0.09	−0.08	–				
6. Maternal harsh parenting	0.09	0.11	−0.07	−0.10	0.30***	–			
7. Children's insufficient sleep duration	-0.05	0.03	0.02	-0.20**	0.24**	0.13	–		
8. Children's night wakings	0.00	−0.12	0.15	−0.15*	0.07	0.09	0.44***	–	
9. Children' daytime sleepiness	0.00	0.13	0.08	−0.17*	0.31***	0.27***	0.42***	0.35***	–
M	–	3.30	–	2.96	15.46	11.12	3.64	4.45	9.24
SD	–	1.00	–	2.28	6.18	2.94	1.31	1.80	3.19

Children's ethnicity (1 = White, 0 = other) and sex (1 = boys, 0 = girls) were dichotomized

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

been commonly used to plot interactions from path models (e.g., Perry & Ostrov, 2019). SES was treated as a continuous variable. Following recommendations, the interactions were plotted at high (+1 *SD*) and low (−1 *SD*) levels of harsh parenting and SES (Preacher et al., 2006). For significant interactions, the "regions of significance" was calculated; this represents the range of the moderator (i.e., SES) where the simple slopes are significantly different from zero (Preacher et al., 2006). Further, $\Delta\chi^2$ tests were used to determine whether the inclusion of the interaction term improved model fit. As part of exploratory analyses, children's age and sex were investigated as moderators (analyses were not reported on for brevity); no significant interaction effects involving these variables emerged.

Amos 24 was used to fit the path models (Arbuckle, 2016). The control variables were treated as exogenous variables. Those that were significantly associated were allowed to covary. Residual variances among the sleep variables were allowed to correlate. To reduce outlier effects, high-leverage values that were more than 4 *SD*s from the sample mean were replaced with the next highest observed value below 4 *SD*s (Barnett & Lewis, 1994). In total, 2 cases were recoded for income-to-needs ratio. Based on skewness (+2) and kurtosis (−2) statistics and visual inspection, insufficient sleep duration and income-to-needs ratio were skewed and natural logged transformed. However, models were initially fit prior to transforming the variables and no major differences were detected before or after the variables were transformed. For ease of interpreting the findings, final analyses included the untransformed variables. There were minimal missing data for harsh parenting (3%; $n = 5$ mothers), income-to-needs ratio (no missing data), maternal stress (2%; $n = 3$ mothers), children's sleep duration (2%; $n = 3$ mothers), night wakings (2%; $n = 4$ mothers), and sleepiness (2%; $n = 3$ mothers). Full-information maximum likelihood was used to handle missing data (Acock, 2005). The following model fit indices were included: χ^2, comparative fit index (CFI), and root mean square error of approximation (RMSEA) (Browne & Cudeck, 1993). A nonsignificant χ^2 indicates adequate model fit and that there may be no difference between the model-implied variance-covariance matrix and the data-implied variance-covariance matrix (Barrett, 2007). In addition, values above 0.90 for the CFI and those less 0.05 for the RMSEA indicate good model fit (Bentler, 1990; Browne & Cudeck, 1993).

Results

Correlations and descriptive statistics among study variables are presented in Table 1. Observed averages for sleep duration, night wakings, and daytime sleepiness were similar to those reported in other studies of young children (Goodlin-Jones et al., 2008; Sneddon et al., 2013). Several correlations were significant. White/European American status was related to higher SES. Lower SES was related to insufficient sleep duration, more night wakings, and greater daytime sleepiness among children. More maternal stress was associated with harsher maternal parenting. Harsher maternal parenting was related to higher levels of children's daytime sleepiness.

Maternal Harsh Parenting and Children's Sleep

A model was fit to assess direct associations between maternal harsh parenting and children's sleep. The model is

shown in Fig. 1; χ^2 (13) = 15.29, $p = 0.29$; CFI = 0.98; RMSEA = 0.03, $p = 0.65$. Of the covariates, lower SES was associated with insufficient sleep duration and more night wakings. Further, higher levels of maternal stress was associated with insufficient sleep duration and more sleepiness. In addition, more maternal harsh parenting was related to greater daytime sleepiness among children; the estimation of this path improved model fit ($\Delta\chi^2$ (*df*) = 5.86 (1), $p = 0.01$).

The Moderating Role of SES

Next, a model was fit to assess SES as a moderator of relations between maternal harsh parenting and children's sleep. The model is depicted in Fig. 2; χ^2 (15) = 15.20, $p = 0.51$; CFI = 1.00; RMSEA = 0.00, $p = 0.84$. The direct effects between study variables are similar in nature to those reported from the model above and thus are not reiterated here.

The interaction between maternal harsh parenting and SES was associated with children's insufficient sleep duration and the estimation of this path improved model fit ($\Delta\chi^2$ (*df*) = 6.19 (1), $p = 0.01$). The plotted interaction is depicted in Fig. 3a. Based on simple slope testing, the association between harsher maternal parenting and insufficient sleep duration was significant for children from lower SES homes. The simple slope was not significant for their higher SES counterparts, who tended to have more sufficient sleep regardless of whether harsh parenting was low or high. The children who appeared to be most at risk for insufficient sleep duration were those from lower SES backgrounds who experienced higher levels of harsh parenting. Based on the regions of significance, the association between harsher parenting and insufficient sleep duration was significant for those with an SES < 1.33 ($n = 40$ families).

SES also moderated relations between maternal harsh parenting and children's night wakings (Fig. 2) ($\Delta\chi^2$ (*df*) = 4.08 (1), $p = 0.04$). As shown in Fig. 3b, harsher maternal parenting was related to more night wakings for children from lower SES backgrounds. This association was significant for those with an SES < 1.25 ($n = 37$ families). For children from higher SES homes, the association between maternal harsh parenting and night wakings was not significant. Children from lower SES homes who were the recipients of higher levels of harsh parenting appeared to be most at risk for night wakings.

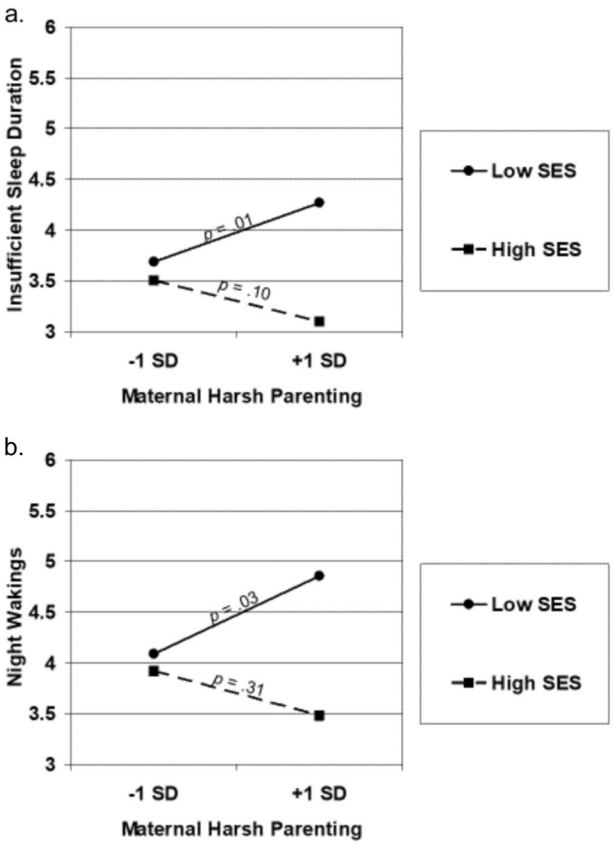

Fig. 3 Socioeconomic status (SES) as a moderator of relations between maternal harsh parenting and children's sleep/wake problems. The *p* value is presented next to the slope.

Discussion

Building on the literature that has considered parenting and children's sleep, we examined relations between maternal harsh parenting and sleep/wake problems (insufficient sleep duration, night wakings, daytime sleepiness) among 2- to 5-year-old children and considered SES as a moderator of these associations. Findings build on a small literature and indicate that more maternal harsh parenting is associated with greater daytime sleepiness among children regardless of SES. Highlighting the importance of contemporaneous considerations of the parenting and socioeconomic contexts, maternal harsh parenting was related to insufficient sleep duration and more night wakings for children from lower SES homes. The results provide additional understanding of relations between early caregiving and young children's sleep and illustrate the influential role of the broader social context.

Identification of factors that influence children's sleep is critical, as sufficient and good-quality sleep is fundamental for psychological (Conway et al., 2016) and physical health (Chaput et al., 2017). Children's sleep often occurs in a family context and parenting behaviors may shape sleep (Bernier et al., 2014; Tikotzky, 2017). Central domains of parenting have been considered including maternal insensitivity (Tetreault et al., 2016), parental permissiveness (Tyler et al., 2019), and inconsistency in parenting practices

(Staples et al., 2015). Despite these advances, additional work is needed and some parenting behaviors that may impact children's sleep have received little attention, including harsh parenting (Berthelon et al., 2020; Rhoades et al., 2012). Our results indicate that young children more frequently exposed to maternal harsh parenting are at greater risk for daytime sleepiness. We controlled for several covariates known to relate to children's sleep, which helped isolate the role of harsh parenting.

Plausible reasons exist regarding why maternal harsh parenting may relate to children's sleep/wake problems. According to the opponent-process theory on sleep, vigilance is the antithesis of sleep and being the recipient of frequent acts of hostility may interfere with the suspension in arousal needed for optimal sleep (Dahl, 1996; Worthman & Melby, 2002). Based on mothers' reports on the MAPS (Parent & Forehand, 2017), several children in our sample may have experienced some level of harshness in the previous two months. Specifically, 95% of mothers yelled/shouted, 58% threatened punishment despite little or no justification, 46% used physical punishment, and 28% spanked while being extremely angry. In addition, 83% of mothers reported losing their temper when their child did not do something they asked him/her to do, and 65% reported exploding in anger toward their child. Repeated exposure to these occurrences, along with others that may co-occur with harsh parenting including parents' negative emotionality and impulsivity (Holden et al., 2014), may serve as forms of distress that interfere with children's abilities to relax and obtain restful sleep. Further, harsh parenting leads to children's increased adjustment problems (Mackenbach et al., 2014), which may compromise sleep (Kelly & El-Sheikh, 2014). Moreover, harsh parenting may lead to heightened stress insensitivity and low physiological regulation, reflected in sympathetic nervous system (Barry et al., 2017) and hypothalamic pituitary system activity (Hastings et al., 2011), which in turn may disrupt sleep (Bagley & El-Sheikh, 2014; El-Sheikh et al., 2008). Overall, we offer these explanations as tentative and assessments of mediating processes are likely to move the field forward.

We investigated SES as it relates to maternal harsh parenting and children's sleep. In contrast to other work (Mills-Koonce et al., 2016), the direct association between SES and maternal harsh parenting was not significant. Low SES was directly related to insufficient sleep duration and more night wakings, which parallels past research (Grandner et al., 2016; Sheehan et al., 2018). In addition, the interaction between harsh parenting and SES yielded significance. Consistent with hypotheses, harsher maternal parenting was related to insufficient sleep duration and more frequent night wakings for children from lower SES backgrounds. Their higher SES counterparts tended to have lower levels of sleep/wake problems regardless of how frequent harsh parenting occurred. The results mirror findings from other studies that considered SES differences related to the effects of parental problem drinking and marital conflict on children's sleep (Kelly & El-Sheikh, 2011, 2019). One unexpected finding emerged. Although only at the trend level ($p = 0.10$), lower levels of harsh parenting was marginally related to less insufficient sleep duration for those from higher SES homes. We are not sure why this trend emerged, and any possible explanation would be overly speculative.

The examination of SES as a moderator is in line with a developmental ecological systems perspective suggesting the importance of considering relations between family functioning and sleep in the broader sociocultural milieu (El-Sheikh & Sadeh, 2015). The interaction effects are consistent with health disparities (Buckhalt, 2011) and cumulative risk perspectives (Evans & Kim, 2013). Children from lower SES backgrounds often face multiple stressors including suboptimal living conditions (e.g., overcrowding) and financial challenges (Evans & Kim, 2013). The wear and tear that commonly occurs from prolonged stress exposure to such low SES conditions may compromise coping systems that help effectively respond to additional risk, including negative family relationships (Evans, 2003; Evans & Kim, 2013). In contrast, children from higher SES homes may maintain an ability to cope with familial adversity and be less prone to its negative effects, including sleep/wake problems.

There are additional explanations for the observed moderation effects. Harsher parenting among those from lower SES backgrounds may be associated with higher rates of community disruption and suboptimal sleeping conditions (e.g., noise, poor ventilation), and this could have contributed to our findings. Further, mothers facing low SES circumstances who parent harshly may also exhibit other characteristics known to impact children's sleep including maternal insensitivity (Tetreault et al., 2016) and elevated stress (Belsky, 1993; Bernier et al., 2013). To this end however, we controlled for mothers' perceived stress to help isolate the unique influence of maternal harsh parenting. Overall, we offer these explanations as tentative. A next step for the field includes investigations of why low SES conditions may exacerbate the effect of family adversity on children's sleep/wake problems.

The moderation analyses revealed another pattern. Although low SES is related to children's sleep/wake problems (Grandner et al., 2016; Sheehan et al., 2018), individual differences exist and there is value in elucidating factors that promote restful sleep in low SES contexts (Grandner et al., 2016). We observed when levels of maternal harsh parenting were lower, sleep/wake problems among children from lower SES homes were reduced and similar to those from higher SES backgrounds. Additional

research is needed in this regard, however the consideration of parenting strategies that exclude harsh behaviors may hold promise for understanding ways to promote sleep in low SES contexts.

Of the few studies to consider relations between harsh parenting and young children's sleep, general measures of sleep/wake problems were used, which precludes conclusions of whether specific parameters may be uniquely impacted (Berthelon et al., 2020; Rhoades et al., 2012). Sleep is a multifaceted construct (Sadeh, 2015) and family adversity does not uniformly disrupt different facets of children's sleep (El-Sheikh and Buckhalt (2015). Our results indicated that relations between maternal harsh parenting and insufficient sleep duration and night wakings were evident only for children from low SES backgrounds, yet daytime sleepiness was impacted regardless of economic standing. Daytime sleepiness taps into vulnerability to sleep loss and harsh parenting may impact other facets of children's sleep not assessed in this study (e.g., trouble falling asleep, disruptions in sleep architecture) that lead to daytime fatigue regardless of SES. Building on the current findings, investigations of multiple sleep parameters are important to gain additional understanding of the facets of sleep impacted by harsh parenting.

Our assessment was based on a cross-sectional design, which precludes conclusions about directionality of effects. Relations between harsh parenting and children's sleep may be transactional, and reciprocal effects are likely. Sleep/wake problems may undermine children's abilities to regulate emotions and exercise executive control over behaviors (Dahl, 1996; Owens et al., 2016) and disruption in these domains could influence parental distress and daytime interactions with children (Meltzer & Westin, 2011). A small but growing literature has examined reciprocal relations between family functioning and children's sleep, and available evidence supports bidirectional associations. Reciprocal effects have been reported between children's sleep/wake problems and parental marital conflict (Kelly & El-Sheikh, 2011), parental problem drinking (Kelly and El-Sheikh (2019), and parents' negative emotionality (Bell & Belsky, 2008). Investigations of bidirectional associations between harsh parenting and children's sleep are likely to provide further understanding about the ways in which children's sleep impacts their family life.

The results suggest several clinical implications and are in line with a general philosophic priority that any individual intervention must be informed with a broader awareness of the social inequalities and stressors that affect families (Lemberger & Lemberger-Truelove, 2016). In addition, our results are based on a community sample and maternal harsh parenting that occurs among otherwise typically functioning families should not be overlooked. Further, attempts to improve children's sleep, especially in low SES contexts, may benefit from considering harsh parenting behaviors. An intervention focused on promoting positive parent-child interactions and decreasing acts of negative parenting was shown to improve infants' sleep (Feinberg et al., 2016). Related work with older children could prove beneficial.

There are study strengths, limitations, and directions for future investigations. We aggregated a broad class of verbal and physical maternal harsh parenting behaviors that occurred generally and out of anger or frustration. Future research should clarify whether the effects of harsh parenting and discipline vary by type, severity, and whether it is done reactively. The cross-sectional design was useful in detecting concurrent relations between children's sleep/wake problems and mothers' harsh parenting. Longitudinal investigations are needed to examine for directionality of effects. We used an established measure to assess mothers' perceptions of children's sleep/wake problems, yet the approach carries limitations. For example, parents may not be fully aware of their children's sleep/wake problems including night wakings (McDowall et al., 2017). Objective measures of sleep (e.g., actigraphy) are needed. Further, the inclusion of fathers or other caregivers in future assessments will help further address research questions. Moreover, although income-to-needs ratio is an established indicator of SES, it may not perfectly capture familial economic circumstances (Braveman et al., 2005; Farah, 2017). In addition, we screened for chronic illness and sleep disorders while also controlling for several covariates, yet other factors not assessed could have influenced the results (e.g., children's temperament; Molfese et al., 2015). Finally, convenience sampling was used and requirements to participate included having access to the internet or an ability to visit our on-campus lab, all of which may impact the generalizability of findings. Acknowledging these limitations, our findings indicate that SES may moderate associations between maternal harsh parenting and children's sleep. The results illustrate the importance of considering children's sleep within the family context and broader sociocultural milieu.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

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