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Demographic and Parenting Correlates of Adolescent Sleep Functioning

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Abstract

Despite the importance of parenting practices for adolescent adjustment, parenting correlates of adolescent sleep functioning remain understudied. This study delineated patterns of sleep functioning in a sample of ethnically diverse, low-income, adolescents and examined associations among three types of parenting practices (parental involvement, parent-child conflict, and parental control) and adolescent sleep functioning (difficulties initiating sleep and maintaining sleep, and sleep duration). Adolescents ($N = 91$, 11-19 years old) self-reported on sleep functioning and parenting practices. Results showed that in the preceding month, 60.5% of adolescents had difficulties initiating sleep and 73.6% had difficulties maintaining sleep. Most adolescents slept 8 or more hours per night, but 30.7% slept less than 8 hours. Latino adolescents slept longer and had fewer difficulties maintaining sleep than non-Latino. High school students had fewer difficulties maintaining sleep than their middle school counterparts; conversely, older adolescents experienced shorter sleep duration than younger ones. Adolescents whose parents had post-secondary education had shorter sleep duration than those whose parents had not graduated from high school. Parental control was correlated with fewer difficulties initiating sleep, whereas parent-child conflict was correlated with more difficulties maintaining sleep. There were no parenting correlates of sleep duration. Latino adolescents had better sleep profiles than non-Latino ones. Regression analyses showed that parental control and parent-child conflict were associated with adolescent sleep functioning across ethnicities. Results suggest that parenting practices, as well as demographic characteristics, are associated with adolescent sleep functioning and should be taken into account in interventions aimed at improving sleep functioning among adolescents.

Keywords

Latinos; African American; adolescents; sleep functioning; parenting; family functioning

Introduction

A growing body of literature indicates that poor sleep functioning has important implications for adjustment and adolescent health. Poor sleep functioning is linked to daytime dysfunction (Wolfson & Carskadon, 1998), impaired executive function (Anderson, Storfer-Isser, Taylor, Rosen, & Redline, 2009), reduced learning ability (Curcio, Ferrara, &

De Gennaro, 2006), and poor school performance (Dewald, Meijer, Oort, Kerkhof, & Bögels, 2010). It has also been implicated in an array of poor health behaviors (Chen, Wang, & Jeng, 2006) and negative health outcomes (Javaheri, Storfer-Isser, Rosen, & Redline, 2008; Snell, Adam, & Duncan, 2007). Yet, there have been relatively few studies examining both demographic and parenting correlates of adolescent sleep functioning. Studies examining associations between ethnicity (Roberts, Roberts, & Chan, 2006), parenting (Dahl & El-Sheikh, 2007; Meltzer & Montgomery-Downs, 2011), and sleep functioning are particularly lacking. A better understanding of factors associated with sleep functioning could aid in identifying types of youth at risk for sleep dysfunction and inform the development of interventions aimed at promoting positive sleep behaviors.

Difficulties initiating and maintaining sleep and sleep duration are some of the most salient indicators of adolescent sleep functioning (Roberts et al., 2006). Difficulties initiating sleep generally refer to difficulties falling asleep within 30 minutes of going to bed, whereas difficulties maintaining sleep encompass sleep disturbances such as waking after sleep onset and early awakening. Difficulties initiating and maintaining sleep are considered part of the diagnosis of insomnia (Johnson, Roth, Schultz, & Breslau, 2006). They often co-occur with psychiatric difficulties such as depression and anxiety (Buysse et al., 2008), and have been associated with diminished adolescent psychosocial functioning and health (Roberts, Ramsay Roberts, & Ger Chen, 2002). Studies suggest that between 25% and 41% of adolescents report difficulties initiating and maintaining sleep (Archbold, Pituch, Panahi, & Chervin, 2002; Ohayon, Roberts, Zulley, Smirne, & Priest, 2000; Roberts et al., 2006). Short sleep duration during adolescence has also been an area of concern for scholars and practitioners. Several studies (Eaton et al., 2010; Roberts, Roberts, & Duong, 2009) have shown that adolescents in the United States report sleeping less than the 8.5-9.5 hours per night recommended for 10 to 17 year olds (National Sleep Foundation, 2013). However, at least one study based on parental reports found that adolescents 14-18 years of age were sleeping an average of 9 hours per night (Williams, Zimmerman, & Bell, 2013).

During adolescence, sleep patterns vary by age and sex due to maturational and societal factors (Dahl & Lewin, 2002). It has been established that older adolescents, high school seniors, and girls following puberty are all at a higher risk for difficulties initiating and maintaining sleep and for shorter sleep duration (Noland, Price, Dake, & Telljohann, 2009; Roberts, Roberts, & Chen, 2000). Several studies have found a higher prevalence of difficulties initiating and maintaining sleep among Latino adolescents (Roberts et al., 2006; Roberts et al., 2000). Studies examining sleep duration among different ethnic groups have been inconclusive. A couple of studies have reported shorter sleep duration among middle school (Fredriksen, Rhodes, Reddy, & Way, 2004) and high school Hispanic adolescents (Eaton et al., 2010); however, one other study reported longer sleep duration among Hispanic youth 9 years and older, compared to European American youth (Williams et al., 2013). Low family income and parental level of education also have been associated with poor sleep functioning in youth (Johnson, Cohen, Kasen, First, & Brook, 2004; Kahn et al., 1989).

The association between family factors such as parenting and sleep functioning among adolescents has been largely neglected in the research literature (Dahl & El-Sheikh, 2007;

Meltzer & Montgomery-Downs, 2011). Yet, the emotional climate of the family (Morris, Silk, Steinberg, Myers, & Robinson, 2007) constitutes an important context for adolescent sleep behaviors, as humans evolved to obtain sleep only in environments in which they feel safe, and to associate the social belonging and social connectedness provided by the family with such feelings of safety (Dahl & Lewin, 2002; McKenna, Ball, & Gettler, 2007). Parenting significantly contributes to adolescents' experience of the family environment (Morris et al., 2007) and likely affects their sleep behaviors. Three dimensions of parenting (i.e., parental involvement, parent-child conflict, and parental control) may be particularly relevant for the emotional climate of the family that constitutes the contexts of adolescent sleep behaviors.

During adolescence, puberty, modifications in brain structure, and maturation of neurobiological processes contribute to changes in cognitive functioning and socio-emotional behavior (Choudhury, Blakemore, & Charman, 2006; Dahl, 2004; Paus, 2005; Yurgelun-Todd, 2007). Physical, cognitive, and socioemotional maturation, in turn, spawn shifts in the parent-child relationship (Collins & Steinberg, 2006; Laursen & Collins, 2009; Steinberg, 2001). Adolescent maturation and shifts in the parent-child relationship may decrease parental involvement, augment parent-child conflict, and reduce parental control (Steinberg & Morris, 2001; Smetana, Campione-Barr, & Metzger, 2006; Steinberg & Silk, 2002).

Parental involvement generates closeness between parents and children; that is, a sense of behavioral and emotional connection (Laursen & Collins, 2009). Both parental involvement and parent-child closeness decrease during adolescence, but still constitute a vital source of support and comfort for adolescents, and are predictors of psychosocial adjustment (Helsen, Vollebergh, & Meeus, 2000; Rueger, Malecki, & Demaray, 2010). For example, lower parental involvement is correlated with higher risk behavior among adolescents (Crouter, Bumpus, Davis, & McHale, 2005; Fletcher, Steinberg, & Williams-Wheeler, 2004). Parental involvement might contribute to better sleep functioning by enhancing adolescents' sense of emotional security (Dahl & Lewin, 2002).

In Western societies, adolescence is characterized by an increasing push for individuation and autonomy, leading to a shift in power within the parent-child relationship (Zimmer-Gembeck & Collins, 2003). These changes might result in emotional strain, which can manifest as interpersonal conflict (Laursen & Collins, 2009). Although a measure of parent-child conflict during adolescence is normative (Laursen, Coy, & Collins, 1998; Montemayor, 1983), high levels of parent-child conflict are detrimental for adolescent adjustment (Klahr, McGue, Iacono, & Burt, 2011), and might negatively affect adolescent sleep functioning as well. A study conducted with pre-adolescents found more sleep problems among children with conflictive parent-child relationships (Bell & Belsky, 2008). High levels of parent-child conflict might diminish perceptions of physical and emotional safety and increase arousal and hyper vigilance, which are detrimental to sleep functioning (Charuvastra & Cloitre, 2009; Dahl & Lewin, 2002).

A body of literature has linked both moderate levels and positive forms of parental control (e.g., behavioral monitoring) to optimal child and adolescent development (Barber & Xia,

2013). A positive form of parental control, monitoring, has shown to protect adolescents from behaviors that may affect their health (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003; DiClemente et al., 2001; Jacobson & Crockett, 2000; Li, Stanton, & Feigelman, 2000). Parental control of children's behavior diminishes during adolescence (Laursen et al., 1998); however, it has been shown to protect adolescents from health risk behaviors (Li et al., 2000). For example, parent-set bedtimes, a manifestation of parental control, have been associated with longer sleep duration among adolescents (Adam, Snell, & Pendry, 2007; Short et al., 2011). However, parental control encompasses practices that extend beyond bedtime schedules, such as monitoring of adolescents' whereabouts, which are likely to have an indirect impact on their sleep behaviors. Further, the efficacy of parental control practices might be largely determined by adolescents' perceptions of parental involvement and parent-child conflict, as the latter two affect the quality of the parent-child relationship and the willingness of youth to comply with parental control practices. Yet, a broader conceptualization of parental control remains understudied in adolescent sleep research.

In the present study, we examined demographic characteristics (sex, age, grade in school, family income, and ethnicity) and dimensions of parenting (parental involvement, parent-child conflict, and parental control) associated with sleep functioning (difficulties initiating and maintaining sleep, and sleep duration) in a sample of ethnically diverse adolescents from low-income families. We hypothesized that older adolescents, students in high school, girls, and adolescents living in the most impoverished households would report more sleep dysfunction. We did not have a hypothesis regarding an association between Latino ethnicity and adolescent sleep functioning, as previous studies have shown mixed results. Moreover, we expected parental involvement and parent-child conflict to be associated with better and worse sleep functioning, respectively. We did not have a particular expectation regarding parental control, as either very low or very high parental control may be detrimental to adolescent adjustment.

Method

Participants

The data for this study are from a multi-faceted study of households in impoverished neighborhoods of Tulsa, Oklahoma ($N = 91$ parent-youth dyads), designed to delineate the individual, familial, and environmental factors relevant to impoverished adolescents' restorative sleep, physical activity, and dietary quality. The goal was to recruit and collect data from parent-adolescent dyads. Inclusion criteria for participating parents included: 1) being the parent or legal guardian of an age-eligible adolescent; 2) being the primary caregiver (i.e. primarily responsible for the care) of an age-eligible adolescent; 3) willingness to participate; and, 4) willingness to provide authorization for the minor child to participate in the study. Stepparents and grandparents were eligible to participate as long as they were primary caregivers of the focal adolescent. Eligibility criteria for participating adolescents included: 1) being a middle or high school student enrolled in Tulsa Public Schools; and 2) willingness to participate in the study. Adolescents were excluded from the study if they had a known medical or developmental problem that precluded regular physical activity, if they had a doctor-prescribed diet or food allergy, or if they had a doctor

diagnosed sleep disorder. Participating adolescents (54.9% male) identified themselves mostly as Latino (78.9%) and African American (12.1%). Almost half of all adolescents were 14 to 16 years old (47.3%), and over half (60.5%) were high school students. Most often, the participating parents were female (91.2%) and reported being the biological mother or the biological father of the focal adolescent (94.3%). Most parents identified themselves as Latino (79.7%) and White (85.7%). The mean age among parents was 39 years ($SD = 5.7$; range 26-51). Over half of them had not finished high school (54.9%). Most parents were married or living as married (76.9%). Almost two-thirds of the families (65.2%) earned less than \$30,000 per year (Table 1).

Procedure

Participating dyads were recruited using non-probability methods, largely through social networks of trained community-based interviewers, and subsequent snowball techniques wherein participants (either parents or adolescents) would provide names and contact information of friends and peers. Parents gave informed consent for themselves and signed permission for their child to participate in the study; adolescents gave signed assent. All data were collected by community-based interviewers who underwent extensive training, including completion of CITI protection of human subjects in research, an 8-hour training to obtain mastery of study objectives and procedures, at least 2 practice interviews, and a formal “check out” interview with a standardized participant that was observed through a two-way mirror by the lead investigator. Data were collected at the participants’ homes and in their language of choice (English or Spanish). Parent data were collected through interviewer-administered survey questionnaires, while adolescent data were collected using a self-administered questionnaire completed on a laptop computer and supported by the Qualtrics system. The Oklahoma State University Institutional Review Board approved all recruitment and data collection procedures. For this study, we used data from the parent and adolescent questionnaires.

Measures

Difficulties initiating sleep—The 2-item sleep latency component of the Pittsburgh Sleep Quality Index, PSQI (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to measure difficulties initiating sleep. One item was “During the past month, how often have you had trouble falling asleep because you cannot get to sleep within 30 minutes?” Answers ranged from 0 (not during the past month) to 3 (three or more times a week). The other item was “During the past month, how long (in minutes) has it usually taken you to fall asleep each night?” Minutes reported by participants were transformed into the same scale as the first item (15 minutes = 0, 16-30 minutes = 1; 31-60 minutes = 2; > 60 minutes = 3). The two items were added, and higher scores indicated more difficulties initiating sleep.

Difficulties maintaining sleep—The 9-item (Cronbach’s $\alpha = .58$) sleep disturbances component of the PQSI (Buysse et al., 1989) was employed to assess difficulties maintaining sleep. A sample question was, “During the past month, how often have you had trouble sleeping because you wake up in the middle of the night or early morning?” Answers ranged from 0 (not during the past month) to 3 (three or more times a week). The scores for the nine items were averaged, and higher scores denoted more difficulties maintaining sleep.

Sleep duration was measured with one item from the PQSI (Buysse et al., 1989), “During the past month, how many hours of actual sleep did you get at night?”

Parental involvement—Seven items (Cronbach’s $\alpha = .83$) from Criss et al. (2013) were used to assess how often the focal youth and his or her caregiver spent time together. A sample item was, “During the past year, how often did you and your parent eat a meal together?” Possible answers ranged from 1 (never) to 5 (very often). Scores for each participant were averaged to create a scale whereby higher scores suggested higher parental involvement.

Parent-adolescent conflict—The 20-item (Cronbach’s $\alpha = .92$) Parent-Child Difficulties Checklist (Rueter, Scaramella, Wallace, & Conger, 1999) was used to assess the frequency of parent-child difficulties in the preceding year over matters such as household chores, choice of friends, use of money and free time, etc. Answers ranged from 0 (never) to 4 (always). The scores for the items were averaged to create a scale, and higher scores indicated more conflict.

Parental control—Six items (Cronbach’s $\alpha = .80$) from Stattin and Kerr (2000) were employed to measure parental monitoring of the focal adolescent’s behavior. A sample item was, “How often in the past year did your parent/caregiver... require that you explain what you did and who you were with?” Answers ranged from 1 (yes, always) to 5 (no, never). Scores for the items were reverse-coded and averaged to create a scale, and higher scores indicated higher parental control.

Depressive symptoms—The 33-item (Cronbach’s $\alpha = .92$) Mood and Feelings Questionnaire, Child version (MFQ-C; Costello & Angold, 1988) was used to assess depressive symptoms. A sample item was, “How often during the past two weeks has each of these statements been true of you? ...I thought that life wasn’t worth living.” Answers were 0 (not true), 1 (sometimes true), and 2 (always true). The scores for the items were summed. Higher scores suggested higher levels of depressive symptoms.

Analytic Plan

Bivariate correlations between demographic and parenting variables and sleep functioning (difficulties initiating sleep, maintaining sleep, and sleep duration) were computed. Furthermore, *t*-tests were calculated to examine differences in the three outcomes of interest by sex and ethnicity (Latino and non-Latino). Three analyses of variance (ANOVA) procedures were conducted to determine differences in sleep functioning by age (11-13, 14-16, and 17-19 years old), grade in school (5-6, 7-8, and 9-12), and parental level of education (less than high school, high school, and post-secondary school). A series of regression models were built to establish associations between demographic characteristics and sleep outcomes. The first three regression models examined associations between demographic characteristics (sex, age, grade in school, ethnicity, grade-point average, and family income) and the three outcomes of interest. Three other regression models examined associations between both demographic and parenting characteristics and sleep outcomes. In this second set of models, we entered age, ethnicity, and depressive symptoms in step one

and parenting characteristics (parental involvement, control, and parent-child conflict) in step two to determine the contribution of parenting characteristics to sleep functioning, above and beyond the variables entered in step one. Age and ethnicity were included in these models because the first set of regression models indicated that those were the only variables associated with sleep outcomes. Depressive symptoms were added to the last set of regression models, due to their reported association with poor sleep functioning in adolescents.

Results

Most adolescents (60.5%) reported having difficulties initiating sleep in the preceding month. Almost a third (30.8%) had difficulties initiating sleep one to three times per week. Almost three-quarters of adolescents (73.6%) reported having difficulties maintaining sleep in the preceding month. Over two-thirds of adolescents (69.3%) reported sleeping an average of 8 hours or more per night, while a quarter (25.3%) reported sleeping 7 hours or less (Table 2). Overall, adolescents reported sleeping $M = 8.55$ ($SD = 2.31$) hours per night (Table 3).

A series of *t*-tests showed no differences between boys and girls regarding difficulties initiating and maintaining sleep or sleep duration. Similarly, there were no differences in sleep functioning between adolescents in families living below or above the federal poverty threshold. On the other hand, differences were found in difficulties maintaining sleep and sleep duration by ethnicity. Latino adolescents reported fewer difficulties maintaining sleep ($M = 4.35$, $SD = 3.41$) than non-Latino adolescents ($M = 7.21$, $SD = 3.98$), $t(88) = 3.13$, $p = .010$. Latino adolescents reported sleeping more hours per night ($M = 9.04$, $SD = 2.06$) than non-Latino adolescents ($M = 6.83$, $SD = 2.40$), $t(88) = -4.02$, $p = .001$.

Furthermore, several differences were found by age and grade in school. Adolescents aged 17 to 19 reported more difficulties initiating sleep ($M = 2.33$, $SD = 1.85$) than adolescents 11 to 13 years old ($M = 1.07$, $SD = 1.53$), $F(2, 88) = 3.34$, $p = .050$. Adolescents 17 to 19 years old also slept fewer hours ($M = 7.45$, $SD = 2.31$) than those 11 to 13 years old ($M = 9.56$, $SD = 2.21$), $F(2, 88) = 5.66$, $p = .010$. There were no age differences in regards to difficulties maintaining sleep. Mirroring results in sleep duration, adolescents in grades 9 through 12 reported sleeping fewer hours ($M = 8.59$, $SD = 2.29$) than those in grades 5 to 6 ($M = 10.70$, $SD = 2.11$), $F(2, 87) = 5.93$, $p = .010$. Interestingly, adolescents in grades 9 through 12 reported a drop in difficulties maintaining sleep ($M = 4.38$, $SD = 3.57$) compared to adolescents in grades 7 to 8 ($M = 6.56$, $SD = 3.60$), $F(2, 87) = 4.03$, $p = .050$. Finally, adolescents whose parents had post-secondary education slept fewer hours ($M = 7.69$, $SD = 2.74$) than those whose parents had not graduated from high school ($M = 9.22$, $SD = 2.06$), $F(2, 88) = 4.95$, $p = .010$. Regression models examining demographic characteristics and sleep function indicated that Latino ethnicity was associated with less difficulty maintaining sleep ($\beta = -0.33$, $p = .010$) and longer sleep duration ($\beta = 0.35$, $p = .001$). No other demographic characteristic was associated with sleep functioning.

Correlational analyses showed that parental control was associated with fewer difficulties initiating sleep; parent-child conflict was linked to more difficulties maintaining sleep; and,

parental involvement was associated with fewer difficulties maintaining sleep. Among the non-parenting variables, older age was associated with more difficulties initiating sleep and shorter sleep duration, while higher depressive symptoms were linked to more difficulties maintaining sleep (Table 3).

Regression models showed that age was associated with difficulties initiating sleep in the first step, but after entering the parenting variables in the model, only parental control was a significant variable in difficulties initiating sleep. Conversely, Latino ethnicity and depressive symptoms, which were associated with difficulties maintaining sleep in the first step, remained significant predictors of difficulties maintaining sleep after the parenting variables were taken into account; among the latter set of variables, only parent-child conflict was significantly associated with difficulties maintaining sleep. Latino ethnicity and age were associated with sleep duration in the first step, and they remained the only predictors of sleep duration after the parenting variables were entered into the model (Table 4).

Discussion

In the present study, we examined demographic characteristics (sex, age, grade in school, income, and ethnicity) and dimensions of parenting (parental involvement, parent-child conflict, and parental control) associated with sleep functioning (difficulties initiating and maintaining sleep, and sleep duration) in a sample of ethnically diverse adolescents from low-income families. As expected, age was positively associated with shorter sleep duration (Carskadon, Acebo, & Jenni, 2004; Ohayon, Carskadon, Guilleminault, & Vitiello, 2004). Likewise, higher levels of depressive symptoms were linked to more difficulties maintaining sleep. This finding is consistent with an emergent body of literature asserting a significant association between depressive symptoms and disrupted sleep functioning among adolescents (Alfano, Zakem, Costa, Taylor, & Weems, 2009; Gregory & Sadeh, 2012) and sleep disturbances as a risk factor for depressive disorders and other psychopathology (e.g., anxiety) during adolescence (see review by Alfano & Gamble, 2009). The association between depressive symptoms and difficulties maintaining sleep underscores the importance of screening and treating adolescents for both depressive disorders and sleep disturbances to optimize emotional and behavioral health.

High school students had less difficulty maintaining sleep than middle school students. The middle school years correspond with puberty, a maturational stage associated with dramatic changes in sleep functioning (Dahl & Lewin, 2002). Alternatively, it could be that high school environments offer more opportunities to fulfill adolescents' growing desire for autonomy and individuation than middle school environments. Changes in sleep functioning between middle and high school should be explored in future studies. Unlike previous studies (Noland et al., 2009; Roberts et al., 2000), we did not identify gender differences in any of the measures of sleep functioning. We did not find differences in adolescent sleep functioning according to family income or poverty level. However, we established that adolescents whose parents had not graduated from high school slept longer on average than those whose parents had post-secondary education. This result was contrary to previous findings linking low parental education to youth's poor sleep functioning (Johnson et al.,

2004; Kahn et al., 1989). It could be that households led by parents with post-secondary education were characterized by environments that favored delayed bedtimes. For example, adolescents in these households might have had greater access to smartphones, tablets, computers, and videogames that kept them from going to bed early (Zickuhr & Smith, 2012). Future studies need to examine the contribution of parental education to adolescent sleep functioning, as it might differ from that of income.

We found differences in sleep functioning according to Latino ethnicity. Latino adolescents perceived fewer difficulties maintaining sleep and longer sleep duration than their non-Latino counterparts (Eaton et al., 2010; Williams et al., 2013), which differed from studies reporting that Mexican-origin adolescents were at higher risk for difficulties maintaining sleep and shorter sleep (Fredriksen et al., 2004; Roberts et al., 2006; Roberts et al., 2000). It is unclear why Latino adolescents reported better sleep functioning than non-Latinos. We speculate that it might be related to Latino adolescents in the sample enjoying a more-stable family environment due to the higher prevalence of two-parent structures. Of the participant caregivers, 74 percent identifying themselves as Latino reported being married or living as married, compared to 36 percent of non-Latino caregivers. A recent study seemed to support our family stability hypothesis, as it showed that adolescents in single-parent households had poorer sleep functioning than their counterparts in two-parent households (Troxel, Lee, Hall, & Matthews, 2014). Other family variables could also be contributing to better sleep functioning among Latino adolescents. For example, the cultural value of familism (Calzada, Tamis-LeMonda, & Yoshikawa, 2012) and close relationships among siblings, who often take on caregiver roles in Latino households (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005), might evoke in adolescents feelings of physical and emotional safety that contribute to positive sleep functioning (Dahl & Lewin, 2002). These hypotheses need to be explored in future studies.

Results showed that parent-child conflict was positively associated with difficulties maintaining sleep. It could be that emotional difficulties derived from conflict increased arousal and hypervigilance among adolescents, which interfered with sleep physiology (Dahl & Lewin, 2002). Conversely, there was a negative association between parental monitoring of adolescent behavior and difficulties initiating sleep. It could be that parents inclined to monitor their children's behavior were more likely to support sleep hygiene by, for example, upholding time limits for the use of electronic devices, setting bedtime routines, and controlling the physical environment of the home. Furthermore, findings did not support those reported in previous studies (Adam et al., 2007; Short et al., 2011) regarding positive associations between parental control, in the form of parent-set bedtimes, and longer sleep duration among adolescents. It could be that in regard to adolescent sleep duration, factors such as maturation and school schedules take precedence over parenting practices. Results highlight the importance of the family context for adolescent sleep and suggest that parenting practices significantly contribute to adolescent health behaviors. Moderate levels of parental control and low parent-child conflict might promote adolescents' positive sleep functioning. Thus, interventions aimed at modifying adolescent sleep behaviors should take into account the quality of the parent-child relationship and parental ability to exercise control over adolescents' sleep environments.

There was a high prevalence of perceived difficulties initiating sleep and maintaining sleep during the preceding month: 60.5% and 86.8%, respectively. Most studies of adolescent sleep functioning have reported difficulties initiating and maintaining sleep together, making a direct comparison difficult. Rates of difficulties initiating sleep and maintaining sleep in those studies have ranged from 25% (Ohayon et al., 2000; Roberts et al., 2000) to 41% (Archbold et al., 2002). Moreover, the 8.55 average number of hours adolescents slept per night was in the low range of the recommended 8.5 to 9.5 hours for adolescents 10 through 17 years old (National Sleep Foundation, 2013), and less than the 9 hours average reported in a recent study of US adolescents 14 through 18 years old (Williams et al., 2013). Similar to another study conducted with a sample of diverse adolescents (Roberts et al., 2009), we found that a quarter of adolescents slept 7 hours or fewer per night. The high rates of perceived sleep dysfunction in our study could be related to the general low socioeconomic status of the families, which might expose adolescents to stressors that interfere with sleep functioning (Johnson et al., 2004).

This study had several limitations. Cross-sectional data precluded the inference of causal relationships between predictor and outcome variables. The study did not use a representative sample of adolescents, thereby limiting the generalizability of the results. Analyses were based on self-reported data. Although studies have largely supported the validity of self-reported data to assess sleep patterns among adolescents (Smith & Trinder, 2001; Wolfson et al., 2003), actigraphy also provides valuable data, particularly in aspects of sleep that are challenging to assess subjectively, such as nocturnal waking events (Werner, Molinari, Guyer, & Jenni, 2008). Further, our question about sleep duration did not differentiate between weeknights and weekends, and between the school year and off school months; thus, we were unable to provide detailed results regarding temporal variations in sleep duration.

Results suggest that non-Latino minority adolescents may be more at risk for sleep dysfunction than Latino adolescents. Likewise, middle school students may be at higher risk for sleep disturbances than high school students. Future studies should examine difficulties initiating and maintaining sleep in tandem with measures of sleep duration to provide a broader picture of adolescent sleep functioning. Findings indicate that parental behavioral control and a low-conflict parent-child relationship might promote positive sleep functioning among adolescents. Thus, modification of sleep behaviors in this age group should take into account parental ability to exercise control over adolescents' sleep environments and the quality of the parent-child relationship. Future studies should examine broader aspects of parenting and the family environment as contexts for adolescent sleep functioning.

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Table 1

Demographic Information

Variables	Adolescents		Parents	
	<i>n</i>	%	<i>n</i>	%
Sex	91		91	
Female	41	45.1	83	91.2
Male	50	54.9	8	8.8
Ethnicity	90		89	
Latino	71	78.9	70	79.7
Non-Latino	19	21.1	19	21.3
Race	91		91	
White	74	81.3	78	85.7
Black/African American	11	12.1	11	12.1
Other	6	6.6	2	2.2
Age	91			
11 - 13	30	33.0		
14 - 16	43	47.3		
17 - 19	18	19.8		
Grade in school	90			
5 th and 6 th	10	11.0		
7 th and 8 th	25	27.5		
9-12 th	55	60.5		
Education			91	
Less than high school			50	54.9
High School			19	20.9
Vocational Training			7	7.7
Some College			7	7.7
College Degree (Associate's and above)			8	8.8
Marital Status			91	
Married			49	53.8
Living as Married			21	23.1
Divorced or Separated			12	13.2
Never Married			9	9.9
Family Income			89	
Less than \$29,000			59	66.3
\$30,000 - \$44,999			16	18.0
\$45,000 - \$59,999			8	9.0
\$60,000 and more			6	6.7

Table 2

Adolescent Self-Reported Sleep Functioning

Variables	<i>n</i>	%
Past Month Difficulties Falling Asleep within 30 Minutes	91	
No difficulties during the past month	36	39.6
Less than once a week	27	29.7
Once or twice a week	20	22.0
Three or more times a week	8	8.8
Past Month Difficulties Maintaining Sleep	91	
No difficulties during the past month	12	13.2
Less than once a week	67	73.6
Once or twice a week	12	13.2
Three or more times a week	0	0.0
Average Sleep Duration During the Previous Month	86	
7 hours or less	23	25.3
8 – 9 hours	33	36.3
10 hours or more	30	33.0

Table 3
Bivariate Correlations and Descriptives for the Continuous Variables Included in the Regression Models

Variables	1	2	3	4	5	6	7	M	SD	Min - Max
1. Age	1							14.17	2.02	11 - 19
2. Depressive Symptoms	.05	1						44.52	9.25	32 - 78
3. Parental Involvement	-.13	-.26*	1					3.25	.75	1 - 5
4. Parent-Child Conflict	.10	.28**	-.02	1				1.92	.62	1 - 4
5. Parental Control	-.31**	-.01	.22*	-.01	1			1.66	.75	1 - 4
6. Difficulties Initiating Sleep	.28**	.12	-.16	.12	-.43**	1		1.60	1.71	0 - 6
7. Difficulties Maintaining Sleep	.01	.36**	-.23*	.37**	.02	.27**	1	4.92	3.70	0 - 14
8. Sleep Duration	-.37**	-.04	-.04	-.13	.15	-.18	-.13	8.55	2.31	1 - 15

Note:

p .001

**
p .01

*
p .05

Table 4

Ordinary Least Squares Regression Models Examining Associations between Demographic Characteristics, Parenting, and Adolescent Sleep Functioning

Variables	Difficulties Initiating Sleep		Difficulties Maintaining Sleep		Sleep Duration	
	<u>Model 2 β</u>		<u>Model 2 β</u>		<u>Model 2 β</u>	
	Model 1 β		Model 1 β		Model 1 β	
Step 1						
Latino Ethnicity	-0.02	0.03	-0.30**	-0.30**	0.34***	0.37***
Age	0.27*	0.15	-0.05	-0.07	-0.30**	-0.30**
Depressive Symptoms	0.11	0.08	0.34***	0.22*	-0.01	-0.02
Step 2						
Parental Involvement		-0.05		-0.14		-0.17
Parent-Child Conflict		0.08		0.31**		-0.10
Parental Control		-0.38***		0.09		0.03
R ²	0.09*	0.17***	0.22***	0.32**	0.24***	0.28
R ²		0.14		0.10		0.03

Note:

β are standardized regression coefficients

Latino ethnicity coded 0 = No, 1 = Yes

p .001

**
p .01

*
p .05