



MONTCLAIR STATE
UNIVERSITY

Montclair State University
**Montclair State University Digital
Commons**

Department of Sociology Faculty Scholarship
and Creative Works

Department of Sociology

10-1-2018

Sleep It Off: Bullying and Sleep Disturbances in Adolescents

Christopher Donoghue

Montclair State University, donoghuec@mail.montclair.edu

Lisa J. Meltzer

University of Colorado Denver

Follow this and additional works at: <https://digitalcommons.montclair.edu/sociology-facpubs>



Part of the [Sociology Commons](#)

MSU Digital Commons Citation

Donoghue, Christopher and Meltzer, Lisa J., "Sleep It Off: Bullying and Sleep Disturbances in Adolescents" (2018). *Department of Sociology Faculty Scholarship and Creative Works*. 42.

<https://digitalcommons.montclair.edu/sociology-facpubs/42>

This Article is brought to you for free and open access by the Department of Sociology at Montclair State University Digital Commons. It has been accepted for inclusion in Department of Sociology Faculty Scholarship and Creative Works by an authorized administrator of Montclair State University Digital Commons. For more information, please contact digitalcommons@montclair.edu.



Contents lists available at ScienceDirect

Journal of Adolescence

journal homepage: www.elsevier.com/locate/adolescence

Sleep it off: Bullying and sleep disturbances in adolescents

Christopher Donoghue^{a,*}, Lisa J. Meltzer^b

^a Montclair State University, USA

^b National Jewish Health, USA



ARTICLE INFO

Keywords:

Bullying
Aggression
Victimization
Sleep disturbances
Adolescents

ABSTRACT

Introduction: Involvement in bullying is associated with negative health outcomes for adolescents. Recent studies suggest that bullying is related to sleep disturbances. The purpose of this study was to examine differences in sleep disturbances (bedtime fears, insomnia, parasomnias) between victims, bullies, and youth not involved in bullying, as well as to explore differences across various types of bullying behavior (verbal, physical, social, cyber).

Methods: High school students ages 14–17 years (mean = 16.0) in the United States (n = 885; 57.3% female; 87.5% White) completed The Children's Report of Sleep Patterns and questions about involvement in verbal, physical, social and cyberbullying.

Results: Differences in all three sleep disturbances were found across groups, with victims and bully-victims reporting more sleep disturbances than bullies and youth not involved. A similar pattern was found across all bullying types, with more sleep disturbances for victims and bully-victims.

Conclusions: The results of this cross-sectional study highlight the importance of screening youth for sleep disturbances that may indicate daytime issues with bullying or victimization, as well as the need for longitudinal studies to elucidate potential pathways between sleep and bullying/victimization.

Aggressive behavior among adolescents is a persistent problem that can lead to physical and psychological harm for those involved. Across the United States, 20.8% of children ages 12–18 years reported being bullied at school during the 2014–15 academic year (Lessne & Yanez, 2016). The most commonly reported form of bullying was verbal (being made fun of, called names, or insulted), followed by social (subject of rumors), but students also report being victims of physical bullying, threats, cyber bullying and having damage done to their property. Involvement in bullying can lead to internalizing and externalizing behaviors, as well as many associated health consequences. Sleep disturbances have recently been explored as a potential factor that may contribute to, or be a consequence of, involvement in bullying. The objective of this study was to compare the frequency of specific sleep disturbances (bedtime fears, insomnia, and parasomnias) between bullies and victims.

According to the classical definition by Olweus (1978), bullying is an intentional aggressive act that is repeatedly carried out on a victim in a situation in which there is an imbalance of power. Victims of bullying have been found to suffer from anxiety, post-traumatic stress, depression, and suicide ideation (Klomek et al., 2009; Matthiesen & Einarsen, 2004; Nielsen, Tangen, Idsoe, Matthiesen, & Magerøy, 2015) as well as somatic conditions such as headaches and stomach aches (APA, 2000; Gini, Pozzoli, Lenzi, & Vieno, 2014; Løhre, Lydersen, Paulsen, Mæhle, & Vatten, 2011). Bullies also suffer from anxiety, depression and suicidal ideation, and those who are involved both as aggressors and victims appear to suffer most severely (Hymel & Swearer, 2015; Kowalski & Limber, 2013; Smokowski, Evans, & Cotter, 2014; Turner, Exum, Brame, & Holt, 2013).

* Corresponding author.

E-mail address: donoghuec@montclair.edu (C. Donoghue).

<https://doi.org/10.1016/j.adolescence.2018.07.012>

Received 11 January 2018; Received in revised form 21 July 2018; Accepted 23 July 2018

Available online 29 July 2018

0140-1971/© 2018 The Foundation for Professionals in Services for Adolescents. Published by Elsevier Ltd. All rights reserved.

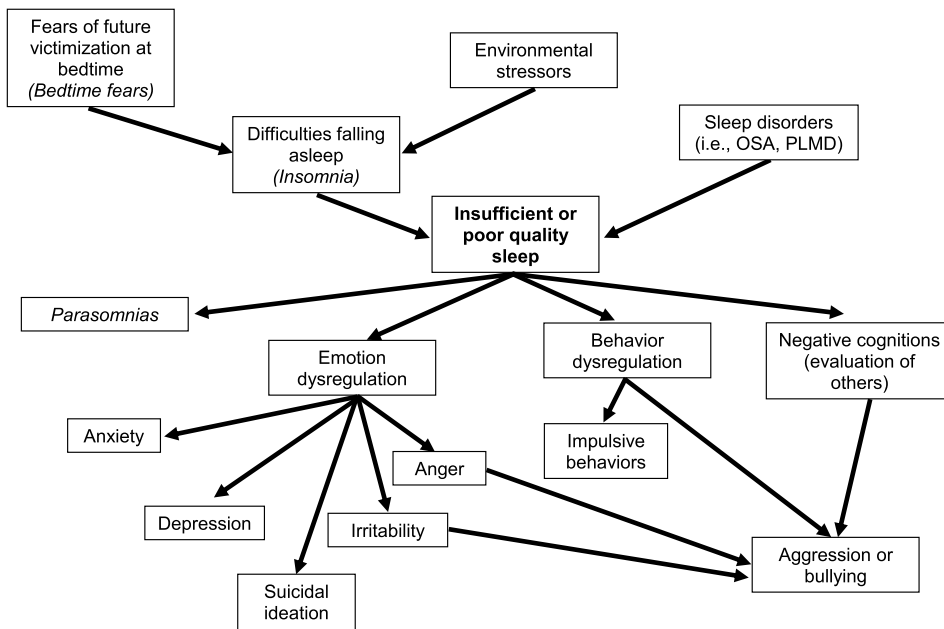


Fig. 1. Potential pathways between sleep, negative outcomes of being a victim of bullying, and aggression or bullying.

Sleep has been associated with negative psychosocial outcomes commonly seen among both bullies and victims. Both objective sleep duration and subjectively reported sleep problems (e.g., trouble sleeping, bedtime worries) have been linked to stress, anxiety, depression and greater risk for attempted suicide in adolescents (Alfano, Zakem, Costa, Taylor, & Weems, 2009; Doane & Thurston, 2014; Greenfield, Lee, Friedman, & Springer, 2011; Liu, 2004). There is not a clear, direct pathway between sleep and negative outcomes for either bullies or victims, however a review of the literature highlights the associations, as well as indirect pathways, as seen in Fig. 1. This model is centered around insufficient or poor quality sleep, which may be a result of being a victim or a bully, and/or a causal factor for bullying behaviors.

Specifically, for victims, the fear of future victimization can interfere with sleep onset if they are thinking about victimization or its effects at bedtime (Astor, Benbenishty, Zeira, & Vinokur, 2002; Randa, Reynolds, & Nobles, 2016). These negative thoughts and feelings result in arousal and vigilance that are not conducive to sleep, resulting in bedtime fears and insomnia (Dahl, 1996). Delayed sleep onset can result in insomnia, as well as insufficient sleep duration, which contributes to both non-REM parasomnias and negative daytime functioning (i.e., sleep walking, sleep talking, sleep terrors) (American Academy of Sleep Medicine, 2014; Wolke & Lereya, 2014).

Studies have also shown different aspects of sleep to mediate the relationship between being a victim and psychosocial outcomes. For example, Tu, Erath, and El-Sheikh (2015) found that teens who were less frequent victims of peer aggression were less likely to internalize or externalize, if they also reported better sleep quality (Tu et al., 2015). In another study of students in an alternative high school, daytime sleepiness was found to mediate the relationship between teacher reported bullying and learning and attention problems (Rubens, Miller, Zeringue, & Laird, 2018). Conversely, youth who have been victims also reported more general sleep problems, insufficient sleep, excess sleep, insomnia, and parasomnias (Biebl, DiLalla, Davis, Lynch, & Shinn, 2011; Herge, LaGreca, & Chan, 2015; Wolke & Lereya, 2014; van Geel, Goemans, & Vedder, 2016).

For bullies, insufficient or poor quality sleep may be a result of environmental stressors such as being in a poor school climate or being victimized themselves, causing bullies to feel the need to remain vigilant at all times, which can contribute to insomnia (Lepore & Kliever, 2013). In addition, sleep disorders such as sleep disordered breathing, restless legs syndrome, and periodic limb movements have also been associated with increased conduct problems, bullying, and other aggressive behaviors in children (Chervin, Dillon, Archbold, & Ruzicka, 2003; O'Brien et al., 2011). In addition, short sleep duration (both reported by diary and actigraphy) has been associated with aggression (Aronen, Paavonen, Fjällberg, Soininen, & Törrönen, 2000; Kamphuis, Meerlo, Koolhaas, & Lancel, 2012; Krizan & Herlache, 2016), and poor sleep quality has been associated with self-reported involvement in bullying (Tu, Spencer, El-Sheikh, & Erath, 2017; Zhou et al., 2015).

Aggression and behavior problems may result from insufficient or poor quality sleep via three pathways: affective (e.g., anger and irritability); behavior (e.g., reduced ability to inhibit negative impulses, aggressive behaviors); and cognition (e.g., negative evaluation of others contributes to risk of hostile/aggressive responses) (Dahl & Lewin, 2002; Krizan & Herlache, 2016). Insufficient sleep, irregular sleep schedules, and insomnia have also been shown to mediate the relationship between peer aggression and externalizing behaviors among bullies ages 10–18 years in France (Kubiszewski, Fontaine, Potard, & Gimenes, 2014). Together these studies suggest that multiple aspects of sleep play a role in the relationship between aggression, violence and negative outcomes.

In summary, the current literature suggests that victims of bullying experience increased symptoms of bedtime fears and insomnia

at bedtime that may result in insufficient sleep, which in turn increases the risk of parasomnias and negative daytime functioning. Bullies may also experience difficulties falling asleep that results in insufficient sleep, and in turn increased parasomnias and negative psychosocial outcomes or increased bullying behaviors.

For the current study, students were asked about their experiences with bedtime fears, insomnia, and parasomnias. As the data were cross-sectional it was not possible to test the pathways highlighted in Fig. 1. However, based on the existing literature and theorized pathways we hypothesized that: (1) victims of bullying would experience more bedtime fears, insomnia, and parasomnias than bullies or students not involved with bullying; and (2) bullies would experience more insomnia and parasomnias compared to students not involved with bullying. Finally, we explored differences in sleep outcomes for different types of bullying behaviors (i.e., verbal, physical, social, and cyber).

1. Methods

1.1. Sample

Data for this study come from the School Climate Understanding and Building Aspirations (SCUBA) project, a cross-sectional survey of school climate and bullying among middle school and high school students in the Northeastern region of the United States. Due to low response rates at the middle school level, the current study includes students from one high school. All of the 1749 students in the school were sent home with a parental consent form and a total of 933 (or 53.3%) returned it with permission to participate. The students with permission were then asked to give their assent if they were under the age of 18 or their consent if they were 18 or older. Some chose not to participate and others were not in school on the day of the survey. We also excluded 6 students that were over the age of 18 from the analysis. The resulting sample size for the study is 885 students, or 50.6% of the population of the school. The surveys were completed in computer labs under the supervision of the research staff.

Demographic variables can be found in Table 1. The mean age of the sample was 16 years (range 14–18 years) and the respondents were mainly White (87.46%). The average number of difficulties with basic needs was 0.24 on a scale of 0–5, with 15.4% reporting at least 1 difficulty with basic needs.

1.2. Measures

Using measures from the School Climate Understanding and Building Aspirations study (Donoghue & Raia-Hawrylak, 2015), bullying status in the last month was defined as being a bully only, a victim only, a bully-victim, and not involved in bullying. Bullying behaviors included verbal aggression, physical aggression, social aggression and cyber aggression. Verbal bullying was defined as being “teased, called mean names, or insulted on purpose by other kids.” Physical bullying included being “pinched, slapped, hit, kicked, shoved or punched by another kid.” Social bullying included having someone tell “lies or spread rumors about me” or trying to “get people not to like me.” Cyberbullying was defined as occurring when “another person wrote mean things about you, called you mean names, posted something to embarrass you on purpose, or threatened you using the internet, with a cell phone, in a computer game, or with other technology.” Participants were asked how frequently they did each of these behaviors to others (never, once or twice, about once per week, several times per week) as well as how often these events happened to them in the last month. Respondents who did any of these things to others at least once or twice in the last month without having them done to them in the same time period were defined as “bullies only.” Those who had any of these things done to them at least once or twice in the last month without doing them to others in the same time period were defined as “victims only.” Respondents who did at least one of these things and had them done to them at least once or twice in the last month were defined as “bully-victims.” Finally, students reporting that they had done none of these things and had not had them done to them in the last month were labeled “not involved.” In addition to these four groups, we also measured bullying status for each of the individual types of aggression (verbal, physical, social and cyberbullying).

1.3. The children's report of sleep patterns

The Children's Report of Sleep Patterns (CRSP) is a self-report measure of sleep patterns, sleep hygiene, and sleep disturbances in adolescents (Meltzer et al., 2014). The CRSP has been shown to be reliable, and has demonstrated construct validity, convergent and

Table 1
Demographic Characteristics, School Climate and Sleep Disturbances (N = 885).

	Mean (SD)	Range	%
Age (years)	16.00 (1.19)	14–18	
Female			56.16
White			87.46
Difficulties with Basic Needs	0.24 (0.63)	0–5	
Bedtime Fears	5.98 (2.60)	3–15	
Parasomnia	2.85 (1.03)	1–6	
Insomnia	8.90 (3.83)	1–19	

divergent validity, and criterion validity (Meltzer et al., 2014). Adolescents are asked to recall the past week (or most recent typical week) when considering questions about sleep behaviors and symptoms of sleep disorders. The measure was designed to allow clinicians and researchers flexibility in assessment of different domains. While there are three main modules, there is not a total score for the entire measure or the individual modules. Rather scores are calculated for each of the scales or indices. Due to limitations in the number of items that could be included in this study, we focused on three sleep disturbance scales that may potentially contribute to or result from aggressive behaviors: bedtime fears (fears and worries that occur when trying to fall asleep), parasomnias (sleep walking and sleep talking), and insomnia (difficulties with sleep initiation and maintenance). Cronbach's Alpha in this study was 0.69 for bedtime fears, 0.82 for insomnia and 0.63 for parasomnia, values that are comparable to the validation sample (Meltzer et al., 2014).

Finally, we measured demographic characteristics and difficulty with meeting basic needs, a proxy for socioeconomic status. Difficulty with meeting basic needs was calculated using a modified 5-item scale from the 1996 Census Bureau's Survey of Income and Program Participation (U.S. Census Bureau, 1996). The questions on the scale asked whether the student or their parents had been unable to pay their rent or mortgage, had been forced to leave their home because they were unable to pay their rent or mortgage, had the gas, electric, television, or phone service turned off because they were unable to pay the bill, had someone in their home in need of a doctor or a hospital but did not go, or had someone in their home in need of a dentist but did not go. Respondents were assigned a point for each of the items to which they said yes to, and a score of zero for each item to which they responded "no" or "I don't know."

1.4. Analysis strategy

Data were tested for violation of normality. Descriptive statistics (means, frequencies) were used to describe the sample, including the prevalence of bullying status groups. Next, analysis of covariance (ANCOVA) was used to examine differences in sleep disturbances for the four bullying status groups and age. Because previous studies have found that bullying activity peaks in middle school and the beginning of high school and then declines as adolescents get older (Vaillancourt et al., 2010), age was also examined as a main effect, with an interaction term (age * bullying status) created to examine whether age moderated the relationship between bully status and sleep. All models controlled for gender, race and socioeconomic status. These covariates were selected because females are more likely to report being a victim of bullying (Hymel & Swearer, 2015); African American children have been found to be more likely to be classified as victims and bully-victims than Whites and others, even after controlling for urbanicity (Goldweber, Waasdorp, & Bradshaw, 2013); and children of lower socioeconomic status have been found to be slightly more likely to be victimized (Tippett & Wolke, 2014). Finally, additional ANCOVAs were conducted to examine differences in sleep disturbances for each of the four bullying types (verbal, physical, social and cyber).

2. Results

As seen in Table 2, almost half (45.20%) of all students reported being both a bully and a victim of any type of bullying at least once or twice in the last month, with an additional 21.13% reporting being a victim only. Cyber bullying had the greatest proportion of respondents reporting not being involved (76.05%), followed closely by physical bullying (75.93%). The greatest level of involvement was found for verbal bullying, as only 37.06% were found to be not involved. Bully only status was most common for those involved in verbal bullying (11.41%) and bully-victim status was most common for those involved in verbal bullying (33.33%). Victim only status was most common for those involved in social bullying (26.10%).

There was no interaction between bullying status and age for bedtime fears, $F(12, 816) = 0.86$, n.s., parasomnias, $F(12, 808) = 1.12$, n.s., or insomnia, $F(12, 817) = 0.94$, n.s. However, a main effect for bullying status was found for all three sleep variables (Table 3). Thus the models show the mean value for sleep disturbances for each bullying status with age, gender, race, and socioeconomic status as covariates. Differences between groups were found for bedtime fears, with post-hoc analyses indicating that bully-victims had more bedtime fears than bully-only or not involved youth. Students who were identified as victim-only also reported more bedtime fears than those not involved. For parasomnias, between group differences were also found, with post-hoc analyses finding that bully-victims experienced more parasomnias than all three other groups. Finally, differences between groups were found for insomnia, with post-hoc analyses indicating more insomnia for bully-victims and victims only than not involved youth.

Table 2
Bullying Status in the Last Month.

	Bully Only		Victim Only		Bully-Victim		Not Involved	
	N	%	N	%	N	%	N	%
Any Type of Bullying	67	7.57	187	21.13	400	45.20	214	24.18
Verbal Bullying	101	11.41	187	17.40	295	33.33	328	37.06
Physical Bullying	33	3.73	73	8.25	93	10.51	672	75.93
Social Bullying	41	4.63	231	26.10	109	12.32	486	54.92
Cyber Bullying	17	1.92	113	12.77	69	7.80	673	76.05

Table 3
Sleep Disturbances by Bullying Status with Covariates and Post-hoc Bonferroni Tests.

	Bully Only		Victim Only		Bully-Victim		Not Involved		ANCOVA		Effect Size
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F	p	
Bedtime Fears	5.13	1.87	6.19 ^b	2.61	6.37 ^{ab}	2.79	5.37	2.16	7.52	< .001	.03
Parasomnia	2.57	0.76	2.77	1.01	3.04 ^{abc}	1.10	2.67	0.90	5.78	.001	.02
Insomnia	8.84	3.70	9.11	3.71	9.33 ^b	3.95	8.00	3.38	4.70	.003	.02

Note. Covariates: female, White, difficulties with basic needs, age; Reported effect size is Partial Eta Squared (small effect = 0.01; medium effect = 0.06; large effect = 0.14);^a significantly higher than bully only ($p < .05$)^b significantly higher than not involved ($p < .05$),^c significantly higher than victim only ($p < .05$).

Table 4 provides the means and test statistics for the four types of bullying by bullying type for all three sleep outcomes. Significant differences were found between bully status groups for all three sleep outcomes across all four bullying types, with small effect sizes. Post-hoc analyses found that more bedtime fears were reported across bullying type by both victim-only youth and bully-victims than not involved youth. In addition, both victim-only and bully-victims involved in verbal bullying also had more bedtime fears than bully-only youth, while bully-victims involved in physical bullying reported more bedtime fears than bully-only youth. Parasomnias were also higher across bullying type for bully-victims compared to not involved youth, while bully-victims involved in verbal bullying also reported more parasomnias compared to bully only and victim-only youth. Finally, insomnia was higher in bully-victims involved in either verbal bullying or cyber bullying compared to not involved youth, while insomnia was higher for victim-only youth involved in social bullying or cyberbullying compared to not involved youth.

3. Discussion

In this study of a large sample of adolescent youth, we found differences in three specific sleep disturbances (bedtime fears, parasomnias, insomnia) depending on one's status as a bully, a victim, or a bully-victim at school for four types of bullying behaviors. Across bullying types we found that either bully-victims or victims reported more sleep disturbances than either bully-only or those not involved in bullying. Sleep disturbances were most common among bully-victims, as they were found to suffer from more fears and parasomnias than those not involved in bullying for all types of bullying behaviors. Victims were also found to experience more bedtime fears than those not involved. Notably, none of the effects were moderated by age, but this may be a result of the sample only including high school students. Together the findings highlight the importance of understanding more about the complex and dynamic relationship between aggressive behavior and sleep in students.

The results of this study are consistent with a growing body of evidence linking sleep to involvement in bullying (Biebl et al., 2011; Herge et al., 2015; van Geel et al., 2016). This study provides evidence that the relationship may be consistent across different kinds of bullying behavior as well as different forms of sleep disturbances. Although much has been learned about the health implications of bullying and victimization, there is a need for more studies that compare the relative impacts of verbal, physical, social and cyber forms of aggression. The findings of this study suggest that different forms of bullying are related to different kinds of

Table 4
Sleep Disturbances by Bullying Type and Bullying Status with Covariates and Post-hoc Bonferroni Tests.

	Bully Only		Victim Only		Bully-Victim		Not Involved		ANCOVA		Effect Size
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F	p	
Verbal Bullying											
Bedtime Fears	5.36	2.18	6.62 ^{ab}	2.84	6.43 ^{ab}	2.87	5.48	2.13	11.11	< .001	.04
Parasomnia	2.66	0.82	2.79	1.01	3.08 ^{abc}	1.14	2.72	0.94	6.53	< .000	.02
Insomnia	8.88	3.88	9.38	3.77	9.41 ^b	4.00	8.24	3.49	4.45	.004	.02
Physical Bullying											
Bedtime Fears	5.13	2.64	6.49 ^b	3.03	6.66 ^{ab}	3.13	5.86	2.43	7.78	< .001	.03
Parasomnia	2.70	0.75	2.79	1.02	3.19 ^b	1.21	2.81	1.00	3.72	.011	.01
Insomnia	8.83	3.37	9.07	3.46	9.70	4.28	8.72	3.73	2.63	.049	.01
Social Bullying											
Bedtime Fears	6.10	2.46	6.56 ^b	2.90	6.90 ^b	3.05	5.47	2.19	9.18	< .001	.03
Parasomnia	2.93	1.14	2.87	0.99	3.14 ^b	1.19	2.76	0.97	2.93	.033	.01
Insomnia	8.68	3.44	9.73 ^b	4.02	9.63	4.16	8.34	3.49	4.92	.002	.02
Cyberbullying											
Bedtime Fears	5.82	3.03	7.25 ^b	3.08	7.17 ^b	3.19	5.65	2.29	15.97	< .001	.05
Parasomnia	2.94	1.14	2.95	0.93	3.28 ^b	1.31	2.78	0.99	4.63	.003	.02
Insomnia	8.06	2.44	10.24 ^b	4.17	10.06 ^b	3.74	8.57	3.69	6.74	< .001	.02

Note. Covariates: age, female, White, difficulties with basic needs; Reported effect size is Partial Eta Squared (small effect = 0.01; medium effect = 0.06; large effect = 0.14); ^a significantly higher than bully only ($p < .05$) ^b significantly higher than not involved ($p < .05$), ^c significantly higher than victim only ($p < .05$).

sleep disturbances, and this may be indicative of broader differences in health outcomes related to different kinds of bullying that may be found in future research.

The direction of causality between sleep and involvement in bullying, which was not examined in this study, remains an area that requires more research attention since both directional possibilities are plausible. For some victims, depression and sleep problems may be bidirectional as depression can lead to sleep disturbances and vice versa (Roberts & Duong, 2014). For bullies, aggressive behaviors may occur as a result of being sleep deprived or they may suffer from sleep disturbances because of anxiety that stems from their aggressive behaviors (Krizan & Herlache, 2016). Although the findings of this study do not disentangle the cause and effect relationship between bullying status and sleep, the results do suggest that adolescents who are both bullies and victims suffer more sleep disturbances than those not involved in bullying at all.

Bully-victims may be in a recurring pattern of bullying some students and getting victimized by others, or they may be undergoing shifts in their bullying behavior. As both bullies and victims they may undergo multiple pathways to anxiety, depression and other negative health outcomes, and this may explain why they reported more sleep disturbances in this study than those not involved. This finding is consistent with prior research which indicates that bully-victims suffer the most severe health consequences from bullying involvement (Hymel & Swearer, 2015; Kowalski & Limber, 2013; Smokowski et al., 2014; Turner et al., 2013).

The findings of this study also have implications for research on bullying and sleep disturbances. The association between specific sleep disruptions, such as parasomnias, have only been considered in a small number of studies (Kubiszewski et al., 2014; Wolke & Lereya, 2014). Differences between bullying groups for insomnia found in this study were similar to a previous study, which also found more symptoms of insomnia in youth who were bully-victims or victims only (Kubiszewski et al., 2014). With increased bedtime fears also reported by these two groups, it is possible that increased cognitive arousal and worries at bedtime contribute to insomnia (Dohnt, Gradisar, & Short, 2012; de Zambotti, Goldstone, Colrain, & Baker, 2018). For victims of aggression, there may be increased feelings of worry and fears at bedtime, in particular about bullying that has already occurred, or fears of bullying that may occur, resulting in difficulties with sleep initiation and maintenance. Identifying bedtime fears separate from insomnia remains important however, as treatment for insomnia may or may not include cognitive approaches (Meltzer & Crabtree, 2015).

More symptoms of parasomnias were also found among bully-victims compared to all three other groups. Notably, both increased bedtime fears and insomnia can result in deficient or poor quality sleep, the two triggers for parasomnias. It is also possible that bully-victim youth are experiencing more irregular sleep schedules, as reported in one previous study (Kubiszewski et al., 2014). Further, as previously suggested, the increased stress related to involvement with bullying may contribute to difficulties falling asleep, which in turn increases the frequency and severity of parasomnias (Wolke & Lereya, 2014). Together, the results of the current study and previous studies that have examined sleep disturbances highlight the critical need for clinicians and others working with youth to be cognizant that sleep disturbances, including parasomnias and insomnia, may indicate daytime issues with bullying or victimization.

The strengths of this study include its large sample size, inclusion of multiple kinds of sleep disturbances as well as an examination of different ways adolescents are bullied or victimized. Study limitations include the use of self-report measures for both sleep and bullying, the potential lack of generalizability of results, and the cross-sectional methodology. Due to limited response rates, this study did not include middle school students, which may further limit generalizability of results as bullying occurs more frequently during the middle school years (Wang, Iannotti, & Nansel, 2009). This sample may also be over representative of bully-victims since we used a broad definition of the term bullying. Future studies should include multiple reporters (i.e., teachers, parents), objective measures of sleep duration and quality (i.e., actigraphy), middle school youth, and schools from different regions of the country. In addition, because of the significant link between sleep and social media use, measures of nighttime technology use should be included in future studies (Woods & Scott, 2016). This is important in light of the higher rates of insomnia among both victims and bully-victims involved in cyberbullying. Finally, in order to disentangle the complex relationship between sleep and bullying, longitudinal studies are needed to monitor the development of or changes in sleep disturbances and bullying behaviors.

In summary, this study found more symptoms of bedtime fears, parasomnias, and insomnia among youth who had been victims or bully-victims, compared to youth who were identified as bully-only or not involved in bullying. These findings were consistent across the three sleep disturbances, as well as across different types of bullying (verbal, physical, social, and cyber). As attention to the problem of bullying in schools has become more widespread, and the consequences of bullying can be severe, it is essential to understand all of the factors that may contribute to or result from bullying. Sleep disturbance is one factor that should be considered in future studies, as well as addressed in bullying intervention programs.

References

- Alfano, C. A., Zakem, A. H., Costa, N. M., Taylor, L. K., & Weems, C. F. (2009). Sleep problems and their relation to cognitive factors, anxiety, and depressive symptoms in children and adolescents. *Depression and Anxiety, 26*(6), 503–512.
- American Academy of Sleep Medicine (2014). *International classification of sleep disorders, 3rd ed.: Diagnostic and coding manual*. Westchester, IL: American Academy of Sleep Medicine.
- APA (2000). *Diagnostic and statistical manual of mental disorders (Text revision)* (4th ed.). Washington, DC: American Psychiatric Association.
- Aronen, E. T., Paavonen, E. J., Fjällberg, M., Soininen, M., & Törrönen, J. (2000). Sleep and psychiatric symptoms in school-age children. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(4), 502–508.
- Astor, R. A., Benbenishty, R., Zeira, A., & Vinokur, A. (2002). School climate, observed risky behaviors, and victimization as predictors of high school students' fear and judgments of school violence as a problem. *Health Education & Behavior, 29*(6), 716–736.
- Biebl, S. J., DiLalla, L. F., Davis, E. K., Lynch, K. A., & Shinn, S. O. (2011). Longitudinal associations among peer victimization and physical and mental health problems. *Journal of Pediatric Psychology, 36*(8), 868–877.
- Chervin, R. D., Dillon, J. E., Archbold, K. H., & Ruzicka, D. L. (2003). Conduct problems and symptoms of sleep disorders in children. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(2), 201–208.
- Dahl, R. E. (1996). The regulation of sleep and arousal: Development and psychopathology. *Development and Psychopathology, 8*(1), 3–27.

- Dahl, R. E., & Lewin, D. S. (2002). Pathways to adolescent health sleep regulation and behavior. *Journal of Adolescent Health, 31*(6), 175–184.
- Doane, L. D., & Thurston, E. C. (2014). Associations among sleep, daily experiences, and loneliness in adolescence: Evidence of moderating and bidirectional pathways. *Journal of Adolescence, 37*(2), 145–154.
- Dohnt, H., Gradisar, M., & Short, M. A. (2012). Insomnia and its symptoms in adolescents: Comparing DSM-IV and ICSD-II diagnostic criteria. *Journal of Clinical Sleep Medicine, 8*(3), 295–299.
- Donoghue, C., & Raia-Hawrylak, A. (2015). Moving beyond the emphasis on bullying: A generalized approach to peer aggression in high school. *Children & Schools, 38*(1), 30–39.
- van Geel, M., Goemans, A., & Vedder, P. H. (2016). The relation between peer victimization and sleeping problems: A meta-analysis. *Sleep Medicine Reviews, 27*, 89–95.
- Gini, G., Pozzoli, T., Lenzi, M., & Vieno, A. (2014). Bullying victimization at school and headache: A meta-analysis of observational studies. *Headache: The Journal of Head and Face Pain, 54*(6), 976–986.
- Goldweber, A., Waasdorp, T. E., & Bradshaw, C. P. (2013). Examining associations between race, urbanicity, and patterns of bullying involvement. *Journal of Youth and Adolescence, 42*(2), 206–219.
- Greenfield, E. A., Lee, C., Friedman, E. L., & Springer, K. W. (2011). Childhood abuse as a risk factor for sleep problems in adulthood: Evidence from a US national study. *Annals of Behavioral Medicine, 42*(2), 245.
- Herge, W. M., La Greca, A. M., & Chan, S. F. (2015). Adolescent peer victimization and physical health problems. *Journal of Pediatric Psychology, 41*(1), 15–27.
- Hymel, S., & Swearer, S. M. (2015). Four decades of research on school bullying: An introduction. *American Psychologist, 70*(4), 293.
- Kamphuis, J., Meerlo, P., Koolhaas, J. M., & Lancel, M. (2012). Poor sleep as a potential causal factor in aggression and violence. *Sleep Medicine, 13*(4), 327–334.
- Klomek, A. B., Sourander, A., Niemelä, S., Kumpulainen, K., Piha, J., Tamminen, T., ... Gould, M. S. (2009). Childhood bullying behaviors as a risk for suicide attempts and completed suicides: A population-based birth cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry, 48*(3), 254–261.
- Kowalski, R. M., & Limber, S. P. (2013). Psychological, physical, and academic correlates of cyberbullying and traditional bullying. *Journal of Adolescent Health, 53*(1), S13–S20.
- Krizan, Z., & Herlache, A. D. (2016). Sleep disruption and aggression: Implications for violence and its prevention. *Psychology of Violence, 6*(4), 542–552.
- Kubiszewski, V., Fontaine, R., Potard, C., & Gimenes, G. (2014). Bullying, sleep/wake patterns and subjective sleep disorders: Findings from a cross-sectional survey. *Chronobiology International, 31*(4), 542–553.
- Lepore, S. J., & Kliever, W. (2013). Violence exposure, sleep disturbance, and poor academic performance in middle school. *Journal of Abnormal Child Psychology, 41*(8), 1179–1189.
- Lessne, D., & Yanez, C. (2016). *Student reports of Bullying: Results from the 2015 school crime supplement to the national crime victimization survey. Web tables. NCES 2017-015*. National Center For Education Statistics.
- Liu, X. (2004). Sleep and adolescent suicidal behavior. *Sleep, 27*(7), 1351–1358.
- Løhre, A., Lydersen, S., Paulsen, B., Mæhle, M., & Vatten, L. J. (2011). Peer victimization as reported by children, teachers, and parents in relation to children's health symptoms. *BMC Public Health, 11*, 278–284.
- Matthiesen, S. B., & Einarsen, S. (2004). Psychiatric distress and symptoms of PTSD among victims of bullying at work. *British Journal of Guidance & Counselling, 32*(3), 335–356.
- Meltzer, L. J., Brimeyer, C., Russell, K., Avis, K. T., Biggs, S., Reynolds, A. C., et al. (2014). The children's report of sleep patterns: Validity and reliability of the sleep hygiene index and sleep disturbance scale in adolescents. *Sleep Medicine, 15*(12), 1500–1507.
- Meltzer, L. J., & Crabtree, V. M. (2015). *Pediatric sleep problems: A clinician's guide to behavioral interventions*. Washington, D.C.: American Psychological Association.
- Nielsen, M. B., Tangen, T., Idsoe, T., Matthiesen, S. B., & Magerøy, N. (2015). Post-traumatic stress disorder as a consequence of bullying at work and at school. A literature review and meta-analysis. *Aggression and Violent Behavior, 21*, 17–24.
- Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. London, UK: Hemisphere.
- O'Brien, L. M., Lucas, N. H., Felt, B. T., Hoban, T. F., Ruzicka, D. L., Jordan, R., ... Chervin, R. D. (2011). Aggressive behavior, bullying, snoring, and sleepiness in schoolchildren. *Sleep Medicine, 12*(7), 652–658.
- Randa, R., Reynolds, B., & Nobles, M. (2016). Measuring the effects of limited and persistent school bullying victimization: Repeat victimization, fear, and adaptive behaviors. *Journal of Interpersonal Violence, 31*(12), 2605–2619.
- Roberts, R. E., & Duong, H. T. (2014). The prospective association between sleep deprivation and depression among adolescents. *Sleep, 37*(2), 239–244.
- Rubens, S. L., Miller, M. A., Zeringue, M. M., & Laird, R. D. (2018). Associations of bullying, victimization, and daytime sleepiness with academic problems in adolescents attending an alternative high school. *American Journal of Orthopsychiatry, 88*(2), 177–184.
- Smokowski, P., Evans, C., & Cotter (2014). The differential impacts of episodic, chronic, and cumulative physical bullying and cyberbullying: The effects of victimization on the school experiences, social support, and mental health of rural adolescents. *Violence and Victims, 29*(6), 1029–1046.
- Tippett, N., & Wolke, D. (2014). Socioeconomic status and bullying: A meta-analysis. *American Journal of Public Health, 104*(6), e48–e59.
- Tu, K. M., Erath, S. A., & El-Sheikh, M. (2015). Peer victimization and adolescent adjustment: The moderating role of sleep. *Journal of Abnormal Child Psychology, 43*(8), 1447–1457.
- Turner, M. G., Exum, M. L., Brame, R., & Holt, T. J. (2013). Bullying victimization and adolescent mental health: General and typological effects across sex. *Journal of Criminal Justice, 41*(1), 53–59.
- Tu, K. M., Spencer, C. W., El-Sheikh, M., & Erath, S. A. (2017). Peer victimization predicts sleep problems in early adolescence. *The Journal of Early Adolescence, 37*(1), 167–181.
- U.S. Census Bureau (1996). *Survey of Income and program participation (SIPP) 1996 panel wave 1 Washington, DC : U.S. Department of commerce, Bureau of the Census. [producer]*. Washington, DC: U.S. Department of Commerce, Bureau of the Census [distributor]. Note: Core, Topical Module, and Health Insurance Reciprocity Module. Data and documentation were replaced in February 2008. Codebook: CPH-038(I).
- Vaillancourt, T., Trinh, V., McDougall, P., Duku, E., Cunningham, L., Cunningham, C., ... Short, K. (2010). Optimizing population screening of bullying in school-aged children. *Journal of School Violence, 9*(3), 233–250.
- Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*, 368–375.
- Wolke, D., & Lereya, S. T. (2014). Bullying and parasomnias: A longitudinal cohort study. *Pediatrics, 134*(4), e1040–e1048.
- Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence, 51*, 41–49.
- de Zambotti, M., Goldstone, A., Colrain, I. M., & Baker, F. C. (2018). Insomnia disorder in adolescence: Diagnosis, impact, and treatment. *Sleep Medicine Reviews, 39*, 12–24.
- Zhou, Y., Guo, L., Lu, C. Y., Deng, J. X., He, Y., Huang, J. H., ... Gao, X. (2015). Bullying as a risk for poor sleep quality among high school students in China. *PLoS One, 10*(3), e0121602.