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Poor sleep and reactive aggression: Results from a national sample of African American adults

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ABSTRACT

Background: We know that poor sleep can have important implications for a variety of health outcomes and some evidence suggests a link between sleep and aggressive behavior. However, few studies have looked at this relationship among African-Americans in the United States.
Methods: Data from the National Survey of American Life (NSAL) and the NSAL Adult Re-Interview were used to examine associations between sleep duration and self-reported quality of sleep on reactive aggression among African American and Caribbean Black respondents between the ages of 18 and 65 ($n = 2499$).
Results: Controlling for an array of sociodemographic and psychiatric factors, sleep was found to be significantly associated with reactive aggression. Specifically, individuals who reported sleeping on average less than 5 h per night were nearly three times more likely to report losing their temper and engaging in a physical fight (AOR = 3.13, 95% CI = 1.22–8.02). Moreover, individuals who reported being "very dissatisfied" with their sleep were more than two times more likely to report losing their temper and engaging in physical fights (AOR = 3.32, 95% CI = 1.50–7.33). Persons reporting everyday discrimination and problems managing stress were more likely to sleep poorly.
Conclusions: The present study is among the first to document an association between poor sleep and reactive violence among African-Americans. Findings suggest that reducing discrimination may lead to improved sleep and subsequently reduce forms of reactive violence.

Sleep is critical to health and well-being. The U.S. Department of Health and Human Services (2011) recommends adults sleep 7–8 h each night. The average adult, however, is not meeting this recommendation. Poor sleep can have important implications on a variety of health and cognitive outcomes. In particular, von Ruesten et al. (2012) found individuals sleeping less than 6 h of sleep per night to be at greater risk for stroke, cancer, and overall chronic diseases, while additional research has found increased risk of obesity (Cappuccio et al., 2008) and diabetes (Cappuccio et al., 2010) for short sleepers. Research also suggests a link between inadequate sleep and a number of problem behaviors in both children and adults. In children and adolescents, correlations have been found between inadequate sleep and ADHD symptoms (Paavonen et al., 2009), aggression (O'Brien, 2009; Reid et al., 2009; Coulombe et al., 2011), behavioral problems (Gregory et al., 2004), aggressive thoughts and actions (Haynes et al., 2006), violence (Clinkinbeard et al., 2011), and conduct problems (Chervin et al., 2003).

Furthermore, sleep has been shown to impact behavior of adults. A review by Kamphuis et al. (2012) suggests that individual variation in neurobiological systems may cause some individuals to become aggressive as a result of sleep loss. For example, in a sample of 26 healthy adults were found to display reduced emotional control following 55 h of sleep deprivation (Kahn-Greene et al., 2006). Specifically, participants had reduced capacity to tolerate frustrating situations: participants were more likely to blame others for problems and had a decreased willingness to resolve conflict by accepting blame. Additionally, in a group of 10 healthy male college students who chronically slept for either 7–8 h or 9.5–10.5 h per night, Taub (1977) found the shorter sleepers to have

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higher rates of negative affect, including anger/hostility and depression, on a mood-checklist measured three times daily. Kamphuis et al. (2014) also found psychiatric patients with poor sleep quality to be at a higher risk for hostility. Furthermore, in a sample of males diagnosed with antisocial personality disorder, Semiz et al. (2008) found poor sleepers to have higher rates of physical aggression, verbal aggression, anger, and hostility than efficient sleepers.

The impact of sleep on behavior may have a disproportionate effect on African Americans, who have been shown to have reduced sleep quality compared to Caucasians (Durrence and Lichstein, 2006; Grandner et al., 2013; Mezick et al., 2008; National Sleep Foundation, 2010; Redline et al., 1997). While many factors impact the reduced sleep quality experienced by African Americans, African Americans have been consistently shown to have higher chronic and acute stress levels than Caucasians (Turner and Lloyd, 2004; Turner and Avison, 2003; Lu and Chen, 2004; Franko et al., 2004; Williams et al., 1997). Stress has been found to significantly impair sleep quality and duration (Hall et al., 1997, 2000; Kalimo et al., 2000; Kim and Dimsdale, 2007). Physiologically, exposure to stress activates the sympathetic nervous system, which in turn causes one to experience hyper-arousal. The body responds to stress with a "fight or flight" reaction that engages the Hypothalamic-Pituitary-Adrenal (HPA) to increase circulating adrenaline and quicken heart rate, which can impair sleep. For African Americans, in particular, stress exposure may result from residing in disadvantaged neighborhoods. In comparison to other racial/ethnic groups, African Americans are more likely to reside in adverse social environments (Stewart and Simons, 2010), putting them at greater risk for crime and both witnessing and experiencing violence (Brenner et al., 2013; Brooks-Gunn et al., 1997; Massey, 2001). African-Americans are also more likely than other groups to experience financial strain through higher housing-cost burdens (Owens & Tegeler, n.d.), unemployment rates (U.S. Department of Labor (2014)), and uninsured rates (U.S. Department of Health and Human Services (2012)). Additional research by Turner and Avison (2003) found African Americans to have higher estimated stress than Caucasians as a result of increased stressful life events, such as divorce, serious injuries, crime, death of loved ones, school failure, and frequent "bad news." Discrimination has also been found to be a source of increased stress for African Americans relative to Caucasians (Turner and Avison, 2003). Particularly, perceived discrimination has been associated with altered cortisol levels (Fuller-Rowell et al., 2012). The release of cortisol allows the body to cope with stressful experiences, and cortisol level is frequently measured as a biomarker for chronic stress and arousal. In fact, research has found cortisol levels to be higher in the evening for African Americans relative to Caucasians (Cohen et al., 2006; DeSantis et al., 2007), offering further support that stress and discrimination can result in sleep difficulties. Research by Beatty et al. (2011), in particular, found perceived unfair treatment to be associated with sleep disturbances in African Americans.

1. Current study aim

We know that poor sleep can have important implications for a variety of health outcomes, and some evidence suggests a link between sleep and aggressive behavior. However, few studies have looked at this relationship among African-American groups in the United States, especially using nationally representative epidemiologic samples. Given the heightened stressors confronted by African Americans, including their extensive experiences of discrimination and greater involvement in violence in the aggregate, we hypothesize that poor sleep quality and shorter sleep duration will be associated with increased likelihood of reactive aggression.

2. Method

2.1. Sample and procedures

Study findings are based on data from the National Survey of American Life (NSAL) and the NSAL Adult Re-Interview (RIW; Jackson et al., 2004). The NSAL/RIW is a nationally representative sample of non-institutionalized African-American, Caribbean Black, and non-Hispanic white adults ages 18 and older in the United States. The survey gathered background data and extensive information about mental disorders from individuals living in households across the United States. The current study restricted analyses to African American and Caribbean Black respondents between the ages of 18 and 65 included in both the NSAL and RIW data files ($n = 2499$). Sample and procedures are presented here in a summarized form; however, a more detailed description of the NSAL study design, sample, and procedures is available elsewhere (Jackson et al., 2004).

2.2. Measures

2.2.1. Reactive aggression

Reactive aggression (0 = no, 1 = yes) was measured on the basis of respondent self-report: "I lose my temper and get into physical fights".

2.2.2. Sleep

Participants were asked the following question: "During the past month, excluding naps, how many hours of actual sleep did you get at night on average?" We examined sleep as a continuous variable and using hourly cut-points (e.g., less than 5 h, 5–6 h) in contrast with the recommended 7–9 h per night (National Sleep Foundation, 2014). The use of cut-points for sleep is consistent with prior research examining sleep and behavioral outcomes (Clinkinbeard et al., 2011). We also examined self-report sleep problems on the basis of three dichotomous items relating to difficulty initiating sleep, paralysis, and dissatisfaction.

2.2.3. Stress-related factors

We also examined two variables related to stress: perceived discrimination and difficulty reducing stress. *Perceived discrimination* ($\alpha = .88$) was based on 9 items from the Everyday Discrimination Scale (Williams et al., 1997). Sample items include: "How often do you receive poorer service than others at restaurants or stores?" and "How often are you threatened or harassed?" Response options ranged from (1) "never" to (6) "almost every day". *Difficulty reducing stress* (0 = no, 1 = yes) was based on a single item measure which asked respondents the following statement was true: "I can't cut down on stress in my life".

2.2.4. Control variables

The following sociodemographic variables were included as controls: age, gender, race/ethnicity (i.e., Caribbean Black, African American), household income, education level, and marital status. We also controlled for psychiatric morbidity using a modified version of the World Mental Health Composite International Diagnostic Interview (Kessler and Üstün, 2004).

2.3. Analysis

Logistic regression analyses were conducted to examine the relationship between sleep and reactive aggression. We also conducted bivariate (i.e., t-test, Chi-square test of association) and multivariate (i.e., logistic regression) analyses were also conducted to examine the relationship between stress-related factors