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The influence of psychosocial stressors and socioeconomic status on sleep among caregivers of teenagers with asthma, the Puff City study[☆]

Dayna A. Johnson, PhD, MPH, MS, MSW^{a,*}, Lisa J. Meltzer, PhD^b, Talan Zhang, MS^c, Mei Lu, PhD^c, Andrea E. Cassidy-Bushrow, PhD, MPH^c, Stephanie Stokes-Buzzelli, MD^d, Elizabeth Duffy, MA^e, Brittany McKinnon, BA^c, Prashant Mahajan, MD, MPH, MBA^e, Susan Redline, MD, MPH^a, Christine LM Joseph, PhD, MPH^c

^a Division of Sleep and Circadian Disorders, Harvard Medical School and Brigham and Women's Hospital, 221 Longwood Ave, Boston, MA 02115

^b Department of Pediatrics, National Jewish Health, 1400 Jackson St, Denver, CO 80206

^c Public Health Sciences, Henry Ford Health System, 1 Ford Pl, Detroit, MI 48202

^d Department of Emergency Medicine, Henry Ford Health System, 2799 Grand Blvd, Detroit, MI 48202

^e Department of Emergency Medicine, University of Michigan 1540 East Hospital Drive, Ann Arbor MI 48109

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ABSTRACT

Objective: Insufficient sleep is common among caregivers and is associated with worse health outcomes; however, the contributors to poor sleep among caregivers are unknown. We investigated the cross-sectional association between socioeconomic status (SES), psychosocial stressors, and sleep among caregivers.

Methods: Caregivers (n = 98) of teenagers with asthma self-reported sleep duration (hours), sleep quality (very good to very bad), education (<high school to college graduate), income (\$15,000 to \$50,000), and psychosocial stressors (stress, worry, social support, depressive symptoms, nightly awakenings due to caregiving). Logistic and linear regression models were performed to study the association of between SES, psychosocial stressors, and sleep, adjusting for possible confounders.

Results: Caregivers on average were 45.5 years, female (89%), and African American (90%). Average sleep duration was 5.9 hours (standard deviation: 1.5), 72% reported short sleep (<7 hours), and 65% reported “fairly bad or very bad” sleep quality. After adjustment for covariates, caregivers with greater social support had a 44% (95% confidence interval: 0.32, 0.98) lower odds of short sleep duration and slept 20.0 minutes (3.09, 37) longer on average. Greater depressive symptoms were associated with a 26% (1.11, 1.44) higher odds of short sleep and sleeping on average 6.08 minutes (−8.67, −3.49) less at night. SES and other psychosocial stressors were not associated with sleep.

Conclusions: Caregivers had a high prevalence of short and poor quality sleep. Depressive symptoms were associated with shorter sleep, whereas social support was associated with longer sleep. Identifying factors that mitigate the effect of psychosocial stressors on sleep is warranted.

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Introduction

The American Academy of Sleep Medicine recommends that adults sleep 7 to 8 hours for optimal health and performance¹; however, only 65% of adults in the United States adhere to this recommendation, with an even lower prevalence of 54% among African Americans.² Caregivers tend to have shorter sleep duration, poorer sleep quality, and a higher prevalence of sleep disturbances

compared with noncaregivers.^{3–7} Short sleep duration and disturbed sleep are associated with mood, accidents, and negative health outcomes including obesity, hypertension, diabetes, cardiovascular disease, and all-cause mortality.^{8,9} It is important to identify the factors contributing to poor sleep among caregivers to improve their quality of life.

Caring for a child with asthma or a chronic illness is associated with a higher exposure to psychosocial stressors (depression) and poor health,^{10,11} which is associated with poor sleep.^{12–14} To our knowledge, few studies have specifically focused on the sleep of caregivers of children with asthma.^{6,15,16} Caregivers of children with chronic illnesses such as asthma may have disturbed sleep due to nocturnal caregiving or stress due to the challenges of caregiving,^{6,15,16} which may be influenced by stressors that are due to socioeconomic

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* Corresponding author: Division of Sleep and Circadian Disorders, Brigham and Women's Hospital, 221 Longwood BLI 225, Boston, MA, 02115. Tel.: +1 857 307 0341.

E-mail address: djohnson@research.bwh.harvard.edu (D.A. Johnson).

status (SES).^{17,18} However, these factors are understudied. Another limitation of this literature is that the vast majority of the prior studies were conducted among non-Hispanic White populations.^{6,15} Associations may be different in African Americans given the high prevalence of poor sleep,¹⁹ the greater exposure to psychosocial stressors, and the likelihood of living in low-socioeconomic environments.^{12,19–23}

Prior studies have shown that psychosocial stressors and neighborhood factors contribute to poor sleep, particularly among African Americans.^{12,22,24} For example, in a study of African American adults, participants with higher stress slept on average 33 minutes less than those reporting less stress.¹² The prior study focused on general stressors, as opposed to understanding the influence of specific stressors such as anxiety, worry, or depressive symptoms. Additionally, asthma is a highly prevalent condition among African American children, with striking racial disparities in morbidity and mortality.²⁵ As a result of the higher prevalence of asthma among African American children,²⁶ psychosocial factors may be particularly pertinent to African American caregivers and may help to identify a population that may be at increased risk for poor sleep.

Using data from a pilot study to evaluate the feasibility of conducting a Web-based asthma management program in the emergency departments at 2 hospitals, we explored the sleep of caregivers of teenagers with asthma and investigated the association of SES and various psychosocial stressors with sleep duration and quality in a predominately African American sample. We hypothesized that lower SES and greater psychosocial stressors will be associated with shorter sleep duration and poorer sleep quality.

Methods

Puff City in the Emergency Department (PC-ED) was a pilot study to test the feasibility of incorporating a Web-based computer-tailored intervention for urban teens (Puff City) in the emergency departments of 2 hospitals in Detroit, MI. Puff City was designed to help urban teenagers manage their asthma. To be eligible for Puff City, potential participants had to be 13–19 years of age, present to an emergency department with a primary diagnosis of asthma, and have a history of recurrent trouble breathing. Teenagers under 18 years of age had to be accompanied by a caregiver. The details of the Puff City intervention have been previously published.^{27,28} The present study focuses on the caregiver of the teenager enrolled in Puff City. The caregiver (legal guardian) accompanying the teenager at the index emergency department visit was recruited to participate in the caregiver baseline survey conducted during the recruitment period of October 2012 to October 2013. The baseline survey was administered to the caregiver during the emergency department visit. The current analyses use data on sleep measures, SES, and psychosocial stressors of the caregivers. Institutional Review Board approval was obtained at each study site, and written informed consent was obtained from all participants.

Sleep measures

Sleep measures were self-reported by the caregivers. For sleep duration, participants were asked, “on average, how much sleep do you usually get a night on weekdays or workdays?” Responses were measured in hours and further categorized to determine short sleep duration (<7 hours).²⁹ To classify sleep quality, participants rated their sleep quality overall during the past month. Responses for sleep quality ranged from 1 = very good to 4 = very bad. As a result of the distribution of sleep quality, we further dichotomized the variable into very good/fairly good and very bad/fairly bad.

Caregivers were also asked whether he/she had sleepless nights because of his/her teenager's asthma and whether he/she was awakened during the night because of the teenager's asthma. Responses to

the prior questions ranged from 1 = none of the time to 7 = all of the time. These self-reported awakenings due to the teenager's asthma may represent underlying stress and be related to sleep duration and quality, and thus were explored as psychosocial factors.

Socioeconomic status

Self-reported education and income were analyzed as measures of SES. Education was selected from 6 categories and further categorized into less than high school, high school or graduate education diploma (GED), some college, and college graduate. Income was reported as the total yearly household income from all sources in the last year based on 11 categories and analyzed continuously as the midpoint of each category and further grouped into <\$15,000, >\$15,000 and <\$30,000, >\$30,000 and <\$50,000, and >\$50,000.

Psychosocial stressors

We analyzed several measures of psychosocial stressors including stress and worry from the Pediatric Asthma Caregiver's Quality of Life questionnaire,³⁰ social support from the Medical Outcomes Study (MOS-SS),³¹ and depressive symptoms based on the Centers for Epidemiologic Studies–Depression (CES-D).³²

To assess stress, caregivers reported his/her feelings in the past week regarding feeling (1) helpless or frightened when teenager experienced asthma symptoms, (2) frustrated or impatient because teenager was irritable due to asthma, and (3) bothered because teenagers asthma interfered with family relationships, angry that teenager has asthma. Responses ranged from 1 = none of the time to 7 = all the time and were analyzed both continuously and dichotomously as ≥ 4 as high and < 4 as low. Cronbach α in this sample for these stress items was .63.

Caregivers reported how worried or concerned he/she was regarding different activities during the past week, including (1) teenager's performance of normal daily activities, (2) teenager's asthma medications and adverse effects, (3) being overprotective of the teenager, and (4) teenager being able to lead a normal life. Responses ranged from 1 = not very worried/concerned to 7 = very, very worried/concerned and were analyzed both continuously and dichotomously as ≥ 4 as high and < 4 as low. Cronbach α for these “worry” indices was .81.

Caregivers responded to a series of questions from the Medical Outcomes Study Social Support instrument³¹ to assess social support including having someone (1) you can count on to listen to you when you need to talk, (2) to give you information to help you understand a situation, (3) to give you good advice about a crisis, (4) to confide in or talk to about yourself or your problems, (5) whose advice you really want, (6) to share your most private worries and fears with, (7) to turn to for suggestions about how to deal with a personal problem, (8) who understands your problems, (9) to help you if you were confined to bed, (10) to take you or your teen to the doctor if you needed it, (11) to prepare you meals if you are unable to do it yourself, and (12) to help with daily chores if you were sick. This was scored as the average of the 12 questions, and we dichotomized the variable at ≥ 4 (most of the time) as indicating high support.³³ For the analyses, social support was analyzed as both a continuous and dichotomous variable. Cronbach α for the social support measure was .94.

Depressive symptoms were measured according to a modified version of the CES-D.³² Given that sleep is the outcome variable of interest, we excluded the question regarding sleep in the scoring for depressive symptoms. A score > 16 was used to determine depression for descriptive purposes. Depressive symptoms were analyzed continuously in regression models.

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