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Racial/ethnic disparities in sleep health and health care: importance of the sociocultural context

Natasha J. Williams, EdD, MPH, MSW ^{a,*}, Michael A. Grandner, PhD ^b, Shedra A. Snipes, PhD ^c,
April Rogers, MD ^a, Olajide Williams, MD ^d, Collins Airhihenbuwa, PhD ^c, Girardin Jean-Louis, PhD ^a

^a Center for Healthful Behavior Change, Division of Health and Behavior, Department of Population Health, NYU Medical Center, 227 East 30th St, New York, NY 10016

^b Department of Psychiatry, Behavioral Sleep Medicine Program, University of Pennsylvania, 3535 Market St, Philadelphia, PA 19104

^c Department of Biobehavioral Health, The Penn State University, 219 Biobehavioral Health Building, University Park, PA, 16802

^d Columbia University, Department of Neurology, 710 West 168th St, New York, NY 10032

Introduction

Sleep may play an important role in health disparities. Indeed, several studies have shown that racial/ethnic minorities in the United States are more likely to report short (≤ 6 hours) sleep durations, relative to non-Hispanic whites.^{1,2} Furthermore, several studies have shown that although sleep complaints may be difficult to assess in minority populations,³ minorities tend to be at increased risk for poor sleep quality.^{4,5} This is important because habitual short sleep duration is associated with obesity,⁶ cardiovascular disease,⁷ diabetes,⁸ and mortality.⁹

Several studies have also shown poor health outcomes associated with poor sleep quality.¹⁰ Furthermore, several studies have suggested that the relationship between sleep duration and these health outcomes differs across racial/ethnic groups. For example, data from the National Health and Nutrition Examination Survey and National Health Interview Survey data sets have evidenced that relationships between sleep duration and obesity, diabetes, hypertension, and hyperlipidemia depend on individuals race/ethnicity.^{11,12} It is also likely that race/ethnicity influences relationships between sleep duration and plasma levels of C-reactive protein¹³ as well as relationships between sleep apnea and risk of sleep apnea.¹⁴ Taken together, this literature suggests that short sleep duration and/or poor sleep quality are associated with adverse health outcomes, racial/ethnic minorities are at increased risk for short sleep duration and/or poor sleep quality, and the relationships between sleep and health outcomes may be moderated by race/ethnicity. Thus, the issue of sleep health disparities represents an important area of research.

Nearly 3 decades ago, the Secretary's Task Force on Black and Minority Health concluded that "despite the unprecedented explosion of scientific knowledge and the phenomenal capacity of medicine to diagnose, treat, and cure disease, blacks, Hispanics, Native Americans, and those of Asian/Pacific Islander heritage have not

benefited fully or equitably from the fruits of science or from systems responsible for translating and using health sciences technology."¹⁵ Yet, for many reasons, less is known about racial/ethnic health and health care disparities in sleep medicine. Moreover, potential cultural influences on sleep disorders, sleep practices, and habitual sleep duration have received little attention in the adult sleep literature. The main purpose of this review is to (1) examine potential ramifications of inadequate sleep in a multicultural context; (2) identify cultural variations between patient and provider in the delivery of sleep care, borrowing from the medical and psychosocial literature; and (3) propose potential strategies to address sleep disparities. We conclude with an agenda for advancing health disparities research in sleep medicine.

Origins of health care disparities in the United States: a starting point

The origins of health and health care disparities (working definitions are provided in Table 1) have been long debated. The purpose of this review is not to end the debate, but rather to contextualize it to enable a comprehensive understanding of the complex factors that underlie sleep health disparities. Now more than ever, such a discourse is needed as most minority Americans are younger, have lower educational attainment, and are more concentrated in racially segregated urban areas compared with whites.¹⁶ Thus, they experience significantly less earning potential, often falling in the lowest percentile for wealth and income.¹⁷ By 2040, approximately half of the United States population will identify as a minority, with most identifying as "Hispanic."¹⁸ These changing demographics impact health and health care and require unique approaches for health professionals to identify the sociocultural, economic, and psychosocial factors that impact minority groups.

Some have traced disparities to slavery in the United States with a focus on biological differences between blacks and whites.¹⁹ In contrast, W.E.B. Dubois explored the post-Reconstruction era where blacks (ie, African American, African, or individuals of Caribbean descent) in the United States received inferior health care. Blacks were excluded from health and social services organizations including

* Corresponding author at: Center for Healthful Behavior Change, Department of Population Health New York University School of Medicine, 227 East 30th St, 6th Floor, New York, NY 10016. Tel.: +1 646 501 2628; fax: +1 212 263 4201.

E-mail address: natasha.williams2@nyumc.org (N.J. Williams).

orphanages. In the Philadelphia Negro Study, W.E.B. DuBois²⁰ called for a comprehensive examination of the absolute and total social, systemic, and structural conditions that create inequity for blacks rather than focusing only on data that show how they compare with whites. Similarly, in the 1944 study of the role of race in American life, Gunnar Myrdal noted that “area for area, class for class, blacks cannot get the same advantages in the way of prevention and care of disease that whites can.”²¹ Since that time, the mounting evidence of disparities was documented in the Institute of Medicine’s landmark report *Unequal Treatment*,²² where there were differences in receipt of various medical procedures and diagnostic test for cardiovascular disease and cancer and treatment for conditions such as HIV/AIDS, diabetes, and end-stage renal disease. The report concluded with important recommendations including increasing health care providers’ awareness of disparities. From our perspective, in the field of sleep medicine, issues of disparities have not been adequately described. Moreover, the health care workforce in sleep medicine has an ethical responsibility not only to raise awareness but also to articulate clearly a research agenda for addressing these issues in the future, as the field is undergoing significant changes. Indeed, there has been an exponential increase in the number of studies examining racial/ethnic differences in sleep over the past decade.²³ We contend that insight into the sociocultural influences of sleep could enrich the discourse on sleep health disparities. This perspective is built on the foundation of the work that our group has done for nearly a decade with blacks with regard to culture and sleep and how a deeper exploration may help our overall understanding of disparities among non-Hispanic and foreign-born blacks living in the United States.

Race, ethnicity, and culture: key concepts

Sleep behaviors and practices are not random occurrences but are shaped by cultural and societal norms. Generally, an accepted definition of culture is a “highly variable system of meanings”, which are “learned” and “shared by a people or an identifiable segment of a population.”²⁴ Others have defined culture as “the learned and shared beliefs, values, and life ways of designated or particular groups which are generally transmitted intergenerationally and influence one’s thinking and action modes.”²⁵ Within the context of health behavior, culture has been defined as “unique shared values, beliefs, and practices that are directly associated with a behavior, or influence acceptance and adoption of the health education message.”²⁶ However, these views are limited and can often lead to connecting health with learned patterns and practices that are often negative, static, and homogenous.²⁷ Culture plays a major role in norms and goals for

sleep as well as sleep practices and behaviors including when to sleep, where to sleep, and with whom one should sleep. Thus, examining the cultural meanings of sleep to individuals is crucial in the continued efforts in reducing the persistent gap in disparities in sleep health.

In the United States, relations of identity to health are typically framed in the discourse on “race” and “ethnicity.” We recognize that these terms are not synonymous and the combined use, “race/ethnicity,” as is used in this review, results from their broad utilization without being well defined. What follows is a brief historical context for these constructs and a comprehensive definition.

According to Egede,²⁸ race should be understood as a complex identity that includes socially constructed meanings and values rather than framed only in genetic models that limit race to biology. Because social constructions also explain much of the racial variation that we observe in health, race is a social construct that has important health ramifications, although the significance of biological explanations has yet to be fully determined. The history of race as a measured construct in health is long and controversial. We acknowledge that many definitions exist and there appears to be no established agreement on any scientific definition of race. However, it is believed that the concept of race dates back to the 18th century when Johann Blumenbach²⁹ devised the 5-category classification scheme that is most commonly associated with race to refer to those populations brought together in colonial America: the English and other European settlers, the conquered Indian/Native American peoples, and people of Africa brought in to provide slave labor. This also holds with the American Association of Physical Anthropology Statement on Biological Aspects of Race that describes race as “being derived from 19th and early 20th century scientific formulations” where the American system of categorization was largely influenced by English-descended settlements, and serves to distinguish “whites” and “nonwhites.”³⁰ The historical context of race has permeated the health literature, indicating that social consequences of “othering” nonwhites induce stress among minority groups and thus negatively impact their health.

Unlike race, ethnicity is generally accepted as having a social definition. Commonly, ethnicity is defined as customs, language, behaviors, music, literature, heroes, values, and worldview that a group with a common ethnic heritage shares.²⁶ It is indeed in the definition of ethnicity that culture is often used. For example, Edles introduces culture into the framework of ethnicity, indicating culture as overlapping interests within ethnic groups in artifacts of language and customs.³¹ Thus, a full awareness of the social construction of these terms and a comprehensive examination of their intersectionality

Table 1
Working definition of key concepts.

Concept	Definition	Reference
Health disparity	A population where there is a significant disparity in the overall rate of disease incidence, prevalence, morbidity, mortality, or survival rates in the population as compared to the health status of the general population	Agency for Healthcare Research and Quality (AHRQ). 2012 <i>National Healthcare Disparities Report</i> . Rockville MD: U.S. Department of Health and Human Services (HHS), AHRQ Publication No. 13–003, May 2013, http://www.ahrq.gov/research/findings/nhqrd/nhdr12/nhdr12_prov.pdf .
Health care disparity	Racial or ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention	Agency for Healthcare Research and Quality (AHRQ). 2012 <i>National Healthcare Disparities Report</i> . Rockville MD: U.S. Department of Health and Human Services (HHS), AHRQ Publication No. 13–003, May 2013, http://www.ahrq.gov/research/findings/nhqrd/nhdr12/nhdr12_prov.pdf .
Ethnicity	Customs, language, behaviors, music, literature, heroes, values, and worldview that a group with a common ethnic heritage shares	Pasick et al, 1994
Culture	Highly variable systems of meanings, which are learned and shared by a people or an identifiable segment of a population	Rohner, 1984
Cultural competence	The capacity of individuals to exercise interpersonal cultural sensitivity	Resnicow et al, 2000

give meaning to illness beliefs, including sleep, and have important ramifications in addressing sleep health.

Culture and sleep: a new perspective

Sleep is socially scheduled and culturally institutionalized as well as practiced with different meaning across racial, ethnic, cultural, and religious groups.³² For example, the Hopi Indigenous American believes that optimal sleep and dreaming are brought on by the butterfly.³³ In other cultures, associations of sleep are made with cosmologic, religious, or spiritual events in observance of culturally significant phenomena. The Balinese, for example, view refraining from sleep during observance of important spiritual performances as a necessity. Likened to fasting or refraining from eating in Christian practices, staying awake at night in the Balinese culture, for instance, continues until daybreak or beyond during the course of spiritual events.³⁴ It should be expected, then, that sleep practices in the United States may be shaped by religious practices and spiritual beliefs, demographic characteristics, and cultural trends that take shape over time, as sleep and culture are inextricably linked. However, the cultural context within which sleep disturbance, sleep quality, and other sleep-related behaviors occur receives little attention.

Activities of daily living including sleep are grounded within a cultural orientation that is rarely understood in health care and medicine. It is plausible that without this basic understanding of how culture gives meaning to illness, in general, and sleep health, in particular, could lead to a view that culture is a detriment rather than an asset leading to adverse health outcomes. For example, blacks who rely on internal sources of coping including spirituality and religion may be less likely to discuss their sleep problems with their health care providers, which, in turn, could lead to the underdiagnosis and undertreatment of sleep disorders.³⁵

Cross-culturally, there are at least 3 ways of conceptualizing and organizing sleep: monophasic, biphasic, and polyphasic. In cultures endorsing the monophasic sleep modality, which is most common in American and European countries, sleep is concentrated into 1 period. This may reflect the circadian balance of sleeping at night, as with other forms of sleep. However, historical and ethnographic evidence may suggest that pressures from the culture geared to daytime activity and nocturnal rest or a combination of the 2 force sleepers into 1 long nocturnal sleep that maximizes daytime work.³²

In cultures endorsing the biphasic sleep modality, which is common in Latin and Caribbean communities (otherwise referred to as in siesta cultures), the sleep period is subdivided into 2 bouts. Accordingly, a short rest is practiced during the hottest part of the day with longer sleep duration at night. The word *siesta* is Spanish, from the Latin *sexta* or “the sixth hour,” indicating midday rest after awakening. The *siesta* sleep may also derive from combined biological and cultural influences, as in monophasic sleep.³²

In cultures endorsing the polyphasic sleep modality, which is common in “napping” cultures of Asia and Africa, groups anchor their sleep at night but take several daytime naps as needed when under a social condition that allows sleep to take place. For example, in Japan *inemuri*, “to be asleep while present,” refers to sleep that occurs when someone is exhausted from working too hard and needs a nap and may also indicate that one is sacrificing sleep at night to get work done. Because working is an integral component of Japanese culture, especially hard work, *inemuri* is socially acceptable.³²

Cross-cultural lessons in sleep duration, disturbance, and practices

Although the focus of this review is on blacks, in this section, we include a brief overview of cross-cultural examples found in the literature, as a recent review provided a more expansive discussion of

cross-cultural differences in sleep.³⁶ Hollan³⁷ compared the cultural ideas about sleep among rural Indonesian societies and urban middle class Americans and found that cultural differences affected sleep patterns and nighttime behaviors. In Indonesian societies, encounters with deceased relatives or spirits through dreams were very common as well as cosleeping, which causes “fragmented sleep.” Hollan also concluded that cultural expectations of sleep might lead to anxiety as individuals grapple with achieving uninterrupted sleep in the United States. Similarly, in some African societies, night is a sacred time, where encounters with spirits at night while asleep are common.³⁸ Hence, nighttime practices, sleep, and health and well-being are interrelated. Young et al³⁹ examined the cultural sleep profiles of the Hmong immigrants in the United States and noted a significant amount of cultural stressors that interfered with sleep, including cultural beliefs of the *dab tsog*, described as the crushing spirit on the chest. The Hmong immigrants were considered to be at high risk for sleep apnea based on polysomnography and reported more symptoms of sleep paralysis, sleepiness, cataplexy, nightmares, and more REM-related sleep abnormalities when compared with those in the Wisconsin Sleep Cohort study.³⁹

The stresses of adjusting to a new culture have also been found to affect the sleep quality of recent immigrants.⁴⁰ In the United States, acculturation—or the process in which one cultural group adapts to the norms of another cultural group⁴¹—is linked to sleep insufficiencies among black and Latino and Asian immigrants in the form of short sleep duration,⁴² obstructive sleep apnea and psychosomatic disorders,⁴³ and rapid eye movement (REM) sleep abnormalities.⁴⁴ Globally, examples of sleep disparities among immigrants are reported, for example, in the 1996 Swedish National Survey of Immigrants, where Kurdish men living in Sweden had poor self-reported health and sleeping difficulties. These problems were 3.5 times greater than those occurring among Swedish men generally, a finding that was attributed to yearning for the home country and perceived discrimination and unemployment in the host country.⁴⁰ Similarly, compared with Swedish women, self-reported anxiety and disturbed sleep of women of Turkish descent living in Sweden were significantly greater, even after adjusting for age, education, marital status, and employment.⁴⁵

In a survey of sleep quality in children in the United States, socio-cultural factors associated with ethnicity and respiratory illnesses were considered relevant variables. Compared with British children, those of Indian subcontinent had significantly more sleep disturbance associated with persistent wheezing.⁴⁶ Cultural factors and societal norms may drive these ethnic differences. For example, in a survey of parents from the United States and China, it was found that Chinese children went to bed later and woke up earlier and that their sleep duration was 1 hour shorter than that of US children. Compared with their US counterparts, the Chinese children had also more sleep problems. Sleep practices and the school schedules of Chinese children may have accounted for the measured differences.⁴⁷

Black-white disparities in sleep in the United States

As stated previously, several cohort and epidemiological studies conducted in the United States suggest that there are racial and ethnic differences in sleep quality and duration, with blacks reporting shorter or longer sleep duration and poor sleep quality.^{1,48,49} These studies have used subjective and objective reports. For instance, in the Coronary Artery Risk Development in Young Adults study, using wrist actigraphy, an objective measure of sleep duration and quality, Lauderdale et al⁵⁰ found that after adjustment for important sociodemographic characteristics, black men reported the shortest sleep duration followed by black women, white men, and white women, respectively. Other disparities in race-gender interactions

on sleep efficiency and latency were also noted. A similar observation was made in a study conducted by one of the authors (GJL) in San Diego where blacks reported nearly 1 hour less of nocturnal sleep than whites.⁵¹ A meta-analysis of 14 studies conducted in the United States with >4000 participants included a wide range of studies including those that used polysomnography to assess sleep architecture. The findings revealed that objective total sleep time and sleep efficiency effect sizes were -0.48 and -0.54 , respectively.⁵² The findings suggest that sleep quality in blacks is poor compared with whites and blacks sleep significantly less. When looking at subjective sleep duration, a similar effect was found with blacks exhibiting a greater proportion of stage 2 sleep. One of the major strengths of the meta-analysis was the inclusion of studies of individuals in their natural environment, which raises the question of environmental factors that potentially contribute to these differences.^{53–55}

On balance, there is evidence suggesting that the influence of racial or ethnic identity on sleep quality may be mediated by other coexisting factors. For example, Roberts et al⁵⁶ investigated the prevalence of symptoms of disturbed sleep, in ethnically diverse sample of 4175 youths and their caregivers, which consisted of European Americans (35.4% of the sample), African Americans (20.5%), Mexican Americans (20.5%), and other Americans (8.7%), to ascertain whether any differences in sleep experience were attributable to their culture or ethnic status. The overall prevalence of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, insomnia-like syndrome in the month before the interview was 4.7%. Females were more likely to report this syndrome, as were lower income youths. Prevalence for European American youths was 5.3%, 5.2% for African American, and 3.5% Mexican American youths ($P < .05$). Multivariate analyses indicated no significant ethnic differences, supporting the hypothesis that observed differences were due primarily to the effects of status differences, including age, gender, and socioeconomic status.

Another study revealed that when blacks and whites reside within the same urban environments, the black-white differences in sleep duration are minimized.⁵⁷ In that study, the authors reported no observed black-white differences in short sleep duration. The authors surmise that neighborhood characteristics could explain these discrepant findings.

The mechanisms for the black-white sleep disparities remain unclear. However, possible hypotheses include the prevalence of comorbid conditions among blacks⁵⁸; genetic differences^{59,60}; psychosocial and environmental factors including perceived discrimination,^{61,62} socioeconomic status, and disadvantaged neighborhoods.⁶³ In addition, blacks have a higher prevalence and more severe sleep-disordered breathing^{64,65} leading to poor sleep. Future work using samples of blacks with normal sleep (7–8 hours) compared with blacks with insufficient sleep duration, poor sleep quality, or the presence of a sleep disorder would also be important to understand better the underlying mechanisms.

A few studies have observed within-group differences among blacks and sleep complaints.⁶⁶ For instance, Jackson et al⁶⁷ report that, among blacks, the greatest prevalence of short sleep duration increases with professional responsibility and that the largest sleep disparities between blacks and whites exist among professional occupation groups. Black-white disparities also include immigrant blacks, who experience short sleep at a rate 50% above US-born laboring whites but not US-born blacks.⁴² Examining the sleep duration of African/Caribbean immigrants in the health care workforce, Ertel et al⁶⁸ found that African/Caribbean immigrants had shorter sleep duration compared to non-Hispanic whites and that these differences were moderated by socioeconomic status. In addition, previously, we reported ethnic differences in sleep complaints using community-based sleep data among ($n = 1118$) men and women (mean age,

75 ± 6 years). Results revealed that sleep complaints among blacks and whites were 71% and 47%, respectively.⁶⁹ In another investigation of obstructive sleep apnea, we used data from blacks ($n = 554$) recruited from primary care clinics in Brooklyn, NY. The rate of obstructive sleep apnea (OSA) symptoms was high with nearly half reporting snoring (45%) and about one-third reporting other symptoms of sleep apnea including excessive daytime sleepiness (33%) and difficulty maintaining sleep (34%). In addition, we used data from the Counseling African Americans to Control Hypertension trial to examine ethnic differences in risk of daytime sleepiness. Analysis showed that US-born participants had nearly 2-fold greater odds of reporting daytime sleepiness compared with foreign-born participants.⁷⁰ Together, these studies indicate important ethnic differences in sleep parameters, cautioning researchers against the practice of aggregating “non-Hispanic blacks” in assessing racial and ethnic differences, as there may be important within-group differences that are not always recognized. Moreover, future studies should explore mechanistic factors of intraethnic differences in sleep duration, quality, or disturbance.

Given the evidence, the management of sleep disorders in ethnic minorities should take into consideration the cultural context affecting sleep as well as their perspectives on factors affecting their condition. Awareness of these factors is critical in the treatment of racial and ethnic minorities of sleep disorders. Although not conclusive, we highlight these studies above because they represent an important step in recognizing the role of race and ethnicity in understanding the sleep experience of individuals from varying backgrounds. However, it is important to move beyond assessing differences by racial/ethnic groups and consider the role of cultural factors in epidemiological and clinical studies, as culture can inform attitudes and beliefs about treatment and screening practices. Then, it would seem likely that a logical next step would be to develop culturally and linguistically tailored interventions, which have been effective in promoting behavior change in other health conditions.⁷¹

Developing a disparities agenda in sleep medicine

There is convincing evidence of the racial and ethnic disparities in health and health care and that disparities exist even when insurance status, income, age, and severity of conditions are comparable.²² These disparities contribute to worse health outcomes among minorities. For example, blacks are more likely to be overweight/obese, have higher rates of HIV/AIDS infection, have limited access to affordable and high-quality health care, and experience shorter life expectancy compared with non-Hispanic whites.⁷² These disparities could be attributed to patient-, provider- and health care system-level factors.²² From the perspective of sleep health, we know more about patient-level factors and much less about provider- and health care system-level factors, which we describe below.

Patient-level barriers

Patient-level barriers could include patient preferences, treatment refusal, care-seeking behaviors and attitudes, and decision making as to the clinical appropriateness of care.²² Evidence shows that racial and ethnic factors may increase the risk of medical illness. It is widely reported^{73–75} that certain medical conditions or diseases are more prevalent in particular ethnic communities. For example, minorities and immigrants often have more complicated medical problems, which may not respond easily to standard treatment regimens. Some ethnic minority patients are fatalistic about the cause of a disease and/or nihilistic about its treatment.^{76,77} In addition, ethnic minorities may have biased conceptions about health care institutions due to legacies of unethical practices experienced by

minorities,⁷⁸ which may or may not be obvious to medical practitioners. Thus, ethnicity and culture may significantly influence a patient's experience of his health status or illness and what to do about it. Furthermore, a person's decisions about where to go for care and how to prevent or treat illnesses are influenced by a number of factors including culture. Consequently, minority patients are less likely to adhere to recommended treatments. To suggest that these patients adopt new ways of thinking and behaving for the benefit of their own health must be undertaken with sensitivity to the individual's perspective of his illness. Language barriers likely constitute important barriers. Adults with limited English proficiency have been shown to be less likely to receive preventative services including mammograms, and physician visits.⁷⁹ Without the appropriate linguistic abilities, individuals may feel uncomfortable seeking care for their health and sleep disorders as well. Efforts to reduce language barriers through the establishment of health care facilities with multilingual staff may reduce disparities in care, at least at the patient level.²²

Provider-level barriers

There are numerous provider-level barriers that have been suggested as contributing factors to known health disparities including bias, clinical uncertainty, and beliefs and stereotypes about the behavior or health of minority patients.²² In the provision of mental health services for instance, Whaley⁸⁰ argues that aversive racism⁸¹ contributes to the increased numbers of blacks diagnosed with mental illness (eg, schizophrenia). Whaley further suggests that aversive racism, described as negative stereotypes of blacks, may be related to greater diagnosis of mental illness, increased likelihood of receiving medications, and less likely to be referred for outpatient services compared with whites. We argue that aversive racism could be especially helpful in our work as we try to understand some of the racial and ethnic disparities in sleep. For example, it is plausible that white sleep clinicians are less likely to refer black patients for sleep evaluations because of negative beliefs and stereotypes about blacks including being less likely to follow-up with physician-recommended referrals and being less likely to adhere to sleep apnea treatment. Detailed studies are needed to identify whether this is consistent with the concept of aversive racism.

The extant literature provides some evidence to support this assertion. In effect, Tran et al⁸² observed that patients referred for sleep apnea screening were considered to be of high risk, presenting with higher apnea-hypopnea index and were more likely to report comorbid medical conditions including diabetes and depression. The authors suggest that providers may be more likely to refer patients based on perceived severity of sleep apnea, which could represent important physician biases.⁸²

Patient-provider communication is also important, as it is well documented that quality patient-provider communication could lead to better patient outcomes. This is particularly important for blacks, as some literature suggests that patient-provider communication that is perceived as collaborative by blacks could improve adherence to antihypertensive medication.⁸³ One such tool to aid in improving patient-provider communication is cultural competence training that could help to promote cultural humility. There are at least 2 decades of documented medical education training on cultural competence, and it has been proposed as a strategic tool to address racial and ethnic health disparities that could lead to increased quality of care,⁸⁴ but the literature addressing cultural competence in the field of sleep medicine is scant. It is worth considering the evolution of cultural competence training in sleep medicine training programs, given the changing demographics and the number of immigrant populations receiving care in the United States. Although it is not without

limitations and has been highly criticized, when done correctly, it may be an initial first step in the right direction.⁸⁵ In any case, effective communication that is culturally and linguistically appropriate must be considered in efforts to improve the patient-provider relationship.⁸⁶

Health care system-level barriers

It has been estimated that the number of polysomnograms performed each year are far below what is required to meet current needs. For example, 1 study of a public hospital found that despite a highly systematic referral system and the number of patients with risk factors for sleep apnea syndrome, referrals for sleep evaluation averaged only 1 per week over the span of a 2-year period.⁸² Evidently, there are other underlying factors that contribute to referrals for sleep disorders screening. With the passing of the Patient Protection Affordable Care Act in 2010,⁸⁷ it is plausible that there will be increased numbers of referrals for sleep assessment, as more individuals are eligible for such services. However, given the financial disincentives to providers because of the reimbursement for Medicaid services compared with Medicare and private insurance, it is not certain whether increases in patient referrals for sleep evaluations will translate into greater sleep apnea screening in vulnerable patient groups. Lack of geographic distribution of available accredited screening centers poses a problem in screening as well. This has prompted the need to increase the use of portable monitoring systems to screen for sleep apnea. Currently, there are 17 sleep apnea intervention studies that involve portable monitoring systems,⁸⁸ but it is unclear if these solutions will adequately address health care system barriers.

Provider knowledge is another potential barrier to disparities in sleep medicine. Unfortunately, there are a limited number of sleep specialists to treat sleep disorders among the 70 million adults that are estimated to have a sleep disorder in the United States.⁸⁹ Furthermore, provider knowledge of sleep health issues is often limited.⁹⁰ Patients would benefit from increased provider education^{91,92} especially if a cross-cultural curriculum is integrated into sleep medicine.²²

Although understanding these disparities described above is essential, it is also important to note that there are challenges to incorporating culture in to sleep health research. For example, to examine cultural differences in health outcomes would require a large sample size of individuals from various ethnic groups (eg, African American, Caribbean, Caribbean immigrant, etc), which would require significant resources (eg, time and money). Another challenge would involve issues of measurement, as there is conflicting evidence in the literature regarding the optimal way to measure other cultural factors including ethnic identity.⁹³ Thus, in some cases, sleep health researchers would be well served to consider areas that are understudied and not well understood. Nonetheless, these limitations should not deter a sustained effort to address these issues. Rather, they should be viewed as opportunities for collaboration among sleep researchers, anthropologists, and sociologists.

Interventions to reduce or eliminate sleep health disparities

To our knowledge, there are no interventions specifically to address sleep health disparities among blacks. However, given the salient role of culture and health and the racial/ethnic disparities in sleep medicine, we propose that interventions that target blacks should be community oriented and culturally appropriate.²⁷ For example, the PEN-3 model, developed by Airhihenbuwa,⁹⁴ has been used in several health education and health promotion programs including smoking, diabetes, HIV, and other health issues. Briefly, PEN-

3 consists of three primary domains: (a) Relationships and Expectations (RE), focusing on Perceptions, Enablers and Nurturers; (b) Cultural Empowerment (CE), including Positive, Existential and Negative; and (c) Cultural Identity (CI), focusing on the Person, Extended Family or Neighborhood. The model could potentially be used to develop health education and promotion behaviors in sleep medicine including increasing sleep assessment, engagement in healthful sleep practices by minorities, and adherence to sleep disorders treatment. From a sociocultural perspective, health promotion extends beyond the individual because many behaviors, practices, and health-related decision making involve extended kinships including grandparents, aunts, uncles, or individuals who are not biologically related, sometimes referred to as “fictive kin.”⁹⁵ In this way, key family members play a pivotal role in educating about healthful sleep practices and/or adherence to sleep apnea treatment. Similarly, community stakeholders and church leaders could be included in education and targeting at-risk individuals for sleep health. There is a long-established history of successful partnerships with academic centers and community-based organizations to develop interventions to improve health outcomes.⁹⁶ Another point of reference is to ensure that interventions are patient centered and developed. For example, although there is a plethora of adherence research, adherence to recommended sleep care is not patient oriented per se, as there is little autonomous decision making regarding benefits and harms of available treatments. Adherence to physician-recommended laboratory sleep study could become patient centered, if the provider were willing to consider the patient’s context for sleeping and beliefs and barriers to undergoing a sleep study, which could be followed by referrals for home sleep studies. Similarly, a phased-in approach to adherence to positive airway pressure, as used with other chronic conditions including diabetes,⁹⁷ should be considered in the short term. These strategies could be used to develop tailored sleep health education programs to promote sleep assessment, engagement in healthful sleep practices, and adherence to sleep disorders treatments. Such approaches would be successful with adequate buy-in from sleep practitioners, who would have to engage patients in a way that encourages them to become ambassadors for their health care.

Kilbourne et al⁹⁸ suggested a 3-phase model of health disparities research including defining and identifying health disparities and implementing interventions to reduce them. We have provided a robust overview of these disparities and strategies for reducing them. Clearly, it would be important for researchers to test these strategies and offer other lenses through which sleep health disparities can be viewed and embrace a framework of action, as argued by some public health scholars.⁹⁹

Research agenda

Given the patterns of sleep health disparities outlined in this review, we provide recommendations and raise important questions that should be debated in the field.

- As recommended by the Institute of Medicine, integrate cross-cultural education in the training of sleep medicine providers.
- More research should be given to the racial/ethnic disparities in various parameters of sleep as well as in diverse populations (eg, veterans, minority older adults, and children). There should also be an attempt to explore interethnic differences comparing US-born Caribbean blacks, foreign-born Caribbean blacks, and blacks living in urban and rural areas.
- There is a pressing need to conduct an in-depth examination of the views of culture and race by providers in sleep medicine. Questions might include the following: How do providers

view race in their practices of sleep medicine? Is race/ethnicity considered? Are there cultural practices that are believed to influence care and treatment? The utilization of these in-depth discussions could inform future interventions targeting providers as well as intending to inform policy.

- Adherence to treatment for sleep disorders such as obstructive sleep apnea is particularly alarming among blacks. Yet, few studies have examined the patient- and contextual-level factors that might contribute to poor treatment adherence among blacks. This is an important area of inquiry because of the significant benefits associated with evidence-based treatments.
- Although sleep duration is consistently reported to be lower among blacks compared with whites, only a few studies have explored the underlying mechanisms that may contribute to these differences. More research is needed to examine the mediating factors, which might include housing, crowding, noise, temperature, and morbidity.

Conclusion

In this review, we contribute a different perspective on approaches for conceptualizing culture and health when exploring sleep health disparities in racial and ethnic populations. Increases in population diversity and the growing evidence of disparities in sleep highlight the need for a paradigm shift in sleep medicine. Health care disparities continue to persist in the United States and, in many cases, are widening. While the Patient Protection Affordable Care Act has been implemented to address the millions of mostly low-income minority Americans who are uninsured and underinsured, sleep health in this context must be addressed. Although it is an often-overlooked construct, culture is salient to health and may be a particularly influential factor in the sleep experience. We recognize that culture alone cannot be the panacea for addressing observed sleep disparities; it must be reinforced by multilevel, culturally tailored approaches and effective policies. Finally, researchers should consider exploring “race” and “ethnicity” in sleep research, as subpopulations have different experiences.

Disclosure

All coauthors meet the criteria for authorship, including acceptance of responsibility for the scientific content of the manuscript. They have seen and agreed on the contents of the manuscript, and there is no financial conflict or conflicts of interests to report. They certify that the submission is the original work and is not under review at any other publication.

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