
COMMENTARY

Sociology of Sleep Health in the Rio Grande Valley

Jiya Devnani¹, Deepak Srivastava², and Sohail Rao^{3,4}

¹The Village High School, Houston, Texas (Grade 12)

ORCID ID: [0000-0003-0468-7826](https://orcid.org/0000-0003-0468-7826)

²Deepak Srivastava MD, FAASM, FACP, FCCP, RPSGT. Professor of Medicine, Sleep Medicine, and Critical Care, UC Davis,

ORCID ID: [0000-0002-7708-4885](https://orcid.org/0000-0002-7708-4885)

³Sohail Rao, MD, MA, DPhil. Executive Vice President for Research and Leadership Development, DHR Health System and Founding President & CEO, DHR Health Institute for Research & Development

ORCID ID: [0000-0001-5027-9992](https://orcid.org/0000-0001-5027-9992)

⁴Corresponding Author: Sohail Rao, MD, MA, DPhil. DHR Health Institute for Research & Development, 5323 S McColl Road, Edinburg, TX 78539. E-mail: s.rao@dhr-rgv-com

Received 10/10/2022

Accepted for publication: 10/11/2022

Published: 10/11/2022

Abstract

It is estimated that 50 – 70 million Americans have sleep disorders and 1 in 3 (33%) of adults do not regularly get the recommended amount of uninterrupted sleep. Several factors contribute to this burgeoning healthcare crisis which has far-reaching consequences at the individual and societal levels. Residents in the Rio Grande Valley have been identified as the third most vulnerable population for the prevalence of cardiovascular disease in the country, with obesity being a major identifiable contributory factor. Factors that further augment this encumbrance include undiagnosed comorbid sleep disorders. Identifying unique socio-cultural challenges in this growing, vibrant population is vital to improve public health outcomes. Lack of accessible medical resources, high level of uninsured, poverty, and inadequate sleep health education makes this population extremely vulnerable to the sleep debt crisis with its intended negative outcomes.

Keywords: Sleep disorders, sleep apnea, Hispanic, racial disparities

Introduction

Sleep is a natural, reversible condition of rest, and inactivity for the body and mind. Sleep is when our bodies mend, regenerate, and revitalize. A third of our lifetimes is spent in this universally inescapable physiological state, driven by neurochemical phenomena which is significantly influenced by environmental, social, and personal cues. Sleep health is a burgeoning yet neglected health concern; various biological and social variables intertwine to contribute

to this burden, which has far-reaching implications at the individual, social, and societal levels. The importance of sleep deprivation impacting cerebral, cardiovascular, metabolic health, and immunity is well documented in the medical literature. Obstructive sleep apnea is linked to hypertension, heart disease, stroke, atherosclerosis, and poor glycemic control (1). Additionally, sleep interruptions interfere with deep restorative slow-wave sleep, which impacts mental health, memory concentration, and productivity. The amount of sleep one needs changes with age with infants requiring more sleep as compared to the adults

(2, 3). As per the recommendations of the American Academy of Sleep Medicine, infants require 12-16 hours of sleep per day whereas adults aged 18-60 years require over seven hours of sleep per day (Table 1).

Sleep has a bidirectional link between social and environmental influences dictated by interpersonal factors. Recognizing the constraints impacting sleep from an economic and sociocultural landscape is vital. The study of upstream social-environmental forces that weave a complex framework is critical in identifying key influencers that play a role in healthcare delivery. The Rio Grande Valley (RGV) in South Texas is among the fastest growing region in the nation with an estimated population of >1.4 million people. Over 90% of the people living in RGV are of Hispanic ethnicity; 30-40% are uninsured; and >30% live below the poverty line in medically underserved regions. This unique socio-economic and demographic pattern makes it a very vulnerable at-risk population thus requiring strategies with visionary public policy to improve health outcomes.

The Burden of Chronic Disease and Poor Sleep Health in The Rio Grande Valley

Aptly summarizing the urgency of the health crisis, Evelia Castillo, the coordinator of the “Working on Wellness Program,” declared that, “The Valley is ground zero for Texas.” (4). Obesity is significantly more prevalent among Hispanics, who constitute >90% of the population. In the lower RGV, almost 40% population is classified as clinically obese which is greater than the state or national levels. Equally disconcerting is the high percentage of people in the Valley suffering from chronic diseases such as diabetes, liver disorders, cancer, cardiovascular diseases, etc.

Sleep disorders have been linked to an increased risk of heart failure, glucose intolerance, and cognitive impairment. Sleep is a natural, reversible condition of rest, and inactivity for the body and mind. Sleep is when our bodies mend, regenerate, and revitalize. A third of our lifetimes are spent in this universally inescapable physiological state, driven by neurochemical phenomena yet significantly influenced by environmental, social, and personal cues. Sleep health is a burgeoning yet neglected health concern; various biological and social variables intertwine to contribute to this burden, which has far-reaching implications at the individual, social, and societal levels. Sleep has a bidirectional link between social and environmental influences dictated by

interpersonal factors therefore recognizing the constraints impacting sleep from an economic and sociocultural landscape is vital. The study of upstream social-environmental forces that weave a complex framework is critical in identifying key influencers that play a role in healthcare delivery.

Methods

A literature review spanning 2000-2021 utilizing databases that covered social sciences (ASSIA) and clinical medicine (PubMed, Medline) were explored for articles addressing sleep disorders and their adverse health outcomes, disparities, and limitations in access to healthcare with focus on demographically and geographically relevant data. Articles were identified that addressed the influence of factors such as race, language, economic challenges, and sociocultural and environmental conditions.

Results and Discussion

Effects of Sleep Deprivation

It is predicted that 50–70 million Americans suffer from chronic sleep and wakefulness disorders, which impede everyday functioning and negatively affect health and longevity. There are over 90 separate sleep disorders, the International Classification of Sleep Disorders has grouped them into six major categories based on clinical symptoms of sleep-related breathing disorders; excessive daytime drowsiness; trouble starting or sustaining sleep; and abnormal behaviors occurring prior to or during sleep (5). The cumulative long-term impacts of sleep deprivation and sleep disorders have been linked to various negative health outcomes, including an increased risk of hypertension, diabetes, obesity, depression, heart attack, and stroke.

Demographics of Rio Grande Valley

RGV comprises four counties: Cameron, Hidalgo, Starr, and Willacy. Residents of the RGV have been recognized as the third most vulnerable in the country to cardiovascular disease, with obesity being a critical risk factor. Of the estimated 1.4 million people in the RGV approximately 86% of the population is below the age of 65 years. It is estimated that by 2045, the population in RGV will double to approximately 2.4 – 2.8 million people (6).

Limited access to and motivation for education is reflected in one-third of over 25-years’ old not having achieved a ninth-grade education as

opposed to the national average of 5 percent. In addition, half and two-thirds of adults have high school diplomas, and area unemployment rates are high, with 30%–40% living below the federal poverty level. In practically every area of educational attainment, cities in RGV ranked “least educated” (7). Limited health insurance, lack of public transportation, and lack of easily accessible healthy meals are all contributory factors to poor health outcomes (8).

The Burden of Chronic Disease in RGV

Aptly summarizing the urgency of the health crisis, Evelia Castillo, the coordinator of the ‘Working on Wellness Program’ declared “The Valley is ground zero for Texas.” Obesity is significantly more prevalent among Hispanics who constitute >90% of the population in RGV. In the lower RGV, almost 40% population are classified as clinically obese a number far greater than the state or national levels. Estimated prevalence of diabetes is 11.6% of adults in South Texas higher than the rest of Texas [9.3%] (9). South Texas Hispanics have a higher rate of mortality than Hispanics in the remainder of Texas. Hispanics in South Texas experienced a slightly higher rate of mortality from heart disease than non-Hispanics. Hispanic male mortality from strokes is greater than females in South Texas. Sleep disorders have been linked to an increased risk of heart failure, glucose intolerance, and cognitive impairment

Barriers to Sleep Health

“Where we sleep, when we sleep, and with whom we sleep are all important markers or indicators of social status, privilege, and prevailing power relations.” said William Rodriguez Cintron (10). Obesity, diabetes, residing in the inner city, and alcohol use are all risk factors in Hispanics. Acculturation to the American way of life may result in worse sleep patterns, including short sleep duration and poor sleep hygiene.

Is Race a Risk factor?

By 2060, Hispanics/Latinos are expected to constitute 28% of the US population (Figure 1). Hispanics are more likely to be uninsured as compared to whites (11). Two current NIH-sponsored sleep studies on Hispanics in the United States promise to significantly contribute to the literature on various sleep disorders such as obstructive sleep apnea, insufficient sleep syndrome, and restless legs syndrome. Sleep Apnea Global Interdisciplinary

Consortium has given insight into the Hispanic population's different phenotypic subgroups and gender variations (12). Many individuals meeting clinical obstructive sleep apnea criteria could go undiagnosed and subsequently not receive appropriate treatment due to minimum symptoms and presenting complaints.

Disparities and Limitations in access to care:

Language Barriers

Health knowledge deficits may negatively affect outcomes. Spanish is the first language for 79% of the RGV population, and 19% of the population speak English. The inclusion of Spanish-speaking healthcare providers can improve health literacy. Developing trust among new immigrants is vital in developing continuity of care. High social and health risk factors affect children living in low-income areas. These families should be targeted with early-age and culturally appropriate health programs (13).

Sociocultural and environmental factors

Socioeconomically disadvantaged individuals are more likely to sleep in less-than-optimal environments (e.g., too hot, or too cold, noisy, or crowded). Social determinants at individual, societal and social levels impact the framework that influences sleep health. Limited access to healthcare and comprehensive behavioral medicine services and ethno-racial disparities also impacts outcomes (14). Hispanics were less likely to report insufficient sleep than whites; they also have culturally specific sleep patterns, including siestas.

Disparities in Treatment Adherence and Outcomes

Continuous positive airway pressure (CPAP) adherence rates in Hispanic populations are lower than White populations. At a societal level, limited access to sleep medicine specialists, inequitable distribution healthcare resources, limited support from durable medical equipment providers for troubleshooting and support after CPAP initiation as well as language barriers have been identified as contributory factors. At an individual level, there exists mistrust among minorities in the medical system which has been linked to lower medication adherence. Unstable housing conditions, frequent changes in sleeping location can predict lower CPAP use (15).

Clinical Implications and The Path Forward

Proposed Public Policy Reforms

Several grass root movements have been initiated to improve collaborative research and enhance population health outcomes. The Working on Wellness Program, a Texas A&M University's Healthy South Texas initiative, is focused on improving preventive community and clinical health care. The Valley Interprofessional Dedicated Access and Service (VIDAS) program supports the development and implementation of primary care services for residents in the Colonias. The unique role of “promotoras,” who live and work in the communities serving as community advocates and liaisons, educators, mentors, outreach workers, role models, and interpreters is extremely valuable. This emphasis on building relationships within the community is also known as personalismo.

Expanding the mission of the “UniMovil” Mobile Health Clinic to screen for sleep apnea is recommended. UniMovil is a revolutionary concept of a mobile clinic focusing on seven clinical outcomes all of which have impact of sleep health. It includes focus on obesity, diabetes, hypertension, hypertriglyceridemia, low high-density lipoprotein cholesterol (HDL-C) levels, and depression utilizing the Duke Health Profile.

Organizations like LUPE and the Texas A&M AgriLife Extension Service run similar nutrition education programs tackling the obesity epidemic. The National Healthy Sleep Awareness Project launched the pledge to Dejar de Roncar (Stop the Snore) to raise awareness among Hispanics about adverse health outcomes associated with sleep-breathing disorders.

Building on the existing social network and disseminating sleep health information, integrating screening for sleep disorders into primary care frameworks, and embracing telemedicine to widen the footprint are vital strategies. A multidisciplinary approach is required to increase targeted healthcare access in a cost-effective, sustainable model with limited resources in a challenging sociocultural landscape.

Summary

Strategies with visionary public policy are vital to improving health outcome measures. Several grass root movements have been initiated to strengthen collaborative research and enhance population health

outcomes. Generating social awareness, addressing public safety, and implementing change can improve sleep health and associated comorbidities in predominantly Hispanic population in the RGV.

Funding

The project was funded by a Seed Grant from the DHR Health Institute for Research & Development.

Conflict of Interest

The authors have reported no conflict of interest

References

1. Punjabi, N. M. (2004). Sleep-Disordered Breathing, Glucose Intolerance, and Insulin Resistance: The Sleep Heart Health Study. *American Journal of Epidemiology*, 160(6), 521–530. <https://doi.org/10.1093/aje/kwh261>
2. Paruthi S, Brooks LJ, D'Ambrosio C, Hall WA, Kotagal S, Lloyd RM, Malow BA, Maski K, Nichols C, Quan SF, Rosen CL, Troester MM, Wise MS. Recommended Amount of Sleep for Pediatric Populations: A Consensus Statement of the American Academy of Sleep Medicine. *J Clin Sleep Med*. 2016 Jun 15;12(6):785-6. [doi: 10.5664/jcsm.5866](https://doi.org/10.5664/jcsm.5866). PMID: 27250809; PMCID: PMC4877308.
3. Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, Dinges DF, Gangwisch J, Grandner MA, Kushida C, Malhotra RK, Martin JL, Patel SR, Quan SF, Tasali E. Recommended Amount of Sleep for a Healthy Adult: A Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society. *Sleep*. 2015 Jun 1;38(6):843-4. [doi: 10.5665/sleep.4716](https://doi.org/10.5665/sleep.4716). PMID: 26039963; PMCID: PMC4434546.
4. Galvin G. Battle on the Border. *U.S. News & World Report*. 2018 May 16. <https://www.usnews.com/news/healthiest-communities/articles/2018-05-16/a-battle-for-community-health-in-texas-rio-grande-valley>
5. Sateia MJ. International classification of sleep disorders-third edition: highlights and modifications. *Chest*. 2014 Nov;146(5):1387-1394. [doi: 10.1378/chest.1187](https://doi.org/10.1378/chest.1187)

- [10.1378/chest.14-0970](https://doi.org/10.1378/chest.14-0970). PMID: 25367475.
6. Gomez R, Guajardo L, and Ely-Ledesma E. It is time to recognize the Rio Grande Valley as a rising borderland metropolis. Tice University Kinder Institute for Urban Research. 2022 Jun 15. <https://kinder.rice.edu/urbanedge/it-time-recognize-rio-grande-valley-rising-borderland-metropolis#:~:text=The%20population%20in%20the%20RGV%20is%20projected%20to,they%20form%20one%20economic%2C%20social%2C%20and%20ecological%20region.>
 7. McCann A. Most and least educated cities in America. WalletHub. 2022 Jul 18. <https://wallethub.com/edu/e/most-and-least-educated-cities/6656>
 8. Hargraves, J. L., & Hadley, J. (2003). The Contribution of Insurance Coverage and Community Resources to Reducing Racial/Ethnic Disparities in Access to Care. *Health Services Research*, 38(3), 809–829. <https://doi.org/10.1111/1475-6773.00148>
 9. Johnson, E. P., Dunn, M., Cooper, M., & Bhakta, N. (2019). Diabetes Prevention Program Sites Compared with Diabetes Prevalence and Ratio of Primary Care Physicians in Texas. *Preventing Chronic Disease*, 16, 190175. <https://doi.org/10.5888/pcd16.190175>
 10. Cintron WR. When we sleep, where we sleep, and with whom we sleep are all important markers or indicators of social status, privilege, and health. *J Clin Sleep Med*. 2020 Feb 15;16(2):163. doi: [10.5664/jcsm.8262](https://doi.org/10.5664/jcsm.8262). Epub 2020 Jan 13. PMID: 31992431; PMCID: PMC7053039.
 11. Loreda, J. S., Soler, X., Bardwell, W., Ancoli-Israel, S., Dimsdale, J. E., & Palinkas, L. A. (2010). Sleep Health in U.S. Hispanic Population. *Sleep*, 33(7), 962–967. <https://doi.org/10.1093/sleep/33.7.962>
 12. González KA, Tarraf W, Wallace DM, Stickel AM, Schneiderman N, Redline S, Patel SR, Gallo LC, Mossavar-Rahmani Y, Daviglius ML, Zee PC, Talavera GA, Sotres-Alvarez D, González HM, Ramos A. Phenotypes of obstructive sleep apnea in the Hispanic Community Health Study/Study of Latinos. *Sleep*. 2021 Dec 10;44(12):zsab181. doi: [10.1093/sleep/zsab181](https://doi.org/10.1093/sleep/zsab181). PMID: 34272952; PMCID: PMC8664595.
 13. Halbert, C. H., Armstrong, K., Gandy, O. H., & Shaker, L. (2006). Racial Differences in Trust in Health Care Providers. *Archives of Internal Medicine*, 166(8), 896. <https://doi.org/10.1001/archinte.166.8.96>
 14. Gaskin, D. J., Dinwiddie, G. Y., Chan, K. S., & McCleary, R. (2012). Residential Segregation and Disparities in Health Care Services Utilization. *Medical Care Research and Review*, 69(2), 158–175. <https://doi.org/10.1177/1077558711420263>
 15. Borker, P. v, Carmona, E., Essien, U. R., Saeed, G. J., Nouraie, S. M., Bakker, J. P., Stitt, C. J., Aloia, M. S., & Patel, S. R. (2021). Neighborhoods with Greater Prevalence of Minority Residents Have Lower Continuous Positive Airway Pressure Adherence. *American Journal of Respiratory and Critical Care Medicine*, 204(3), 339–346. <https://doi.org/10.1164/rccm.202009-3685OC>



Table 1. Recommended Hours of Sleep for Various Age Groups

AGE	AGE GROUP	RECOMMENDED HOURS OF SLEEP
4-12 months	Infant	12-16 hours per 24 hours
1-2 years	Toddler	11-14 hours per 24 hours
3-5 years	Pre-School	10-13 years per 24 hours
6-12 years	School Age	9-12 hours per 24 hours
13-18 years	Teen	13-18 ours per 24 hours
>18 years	Adults	≥7hours per night

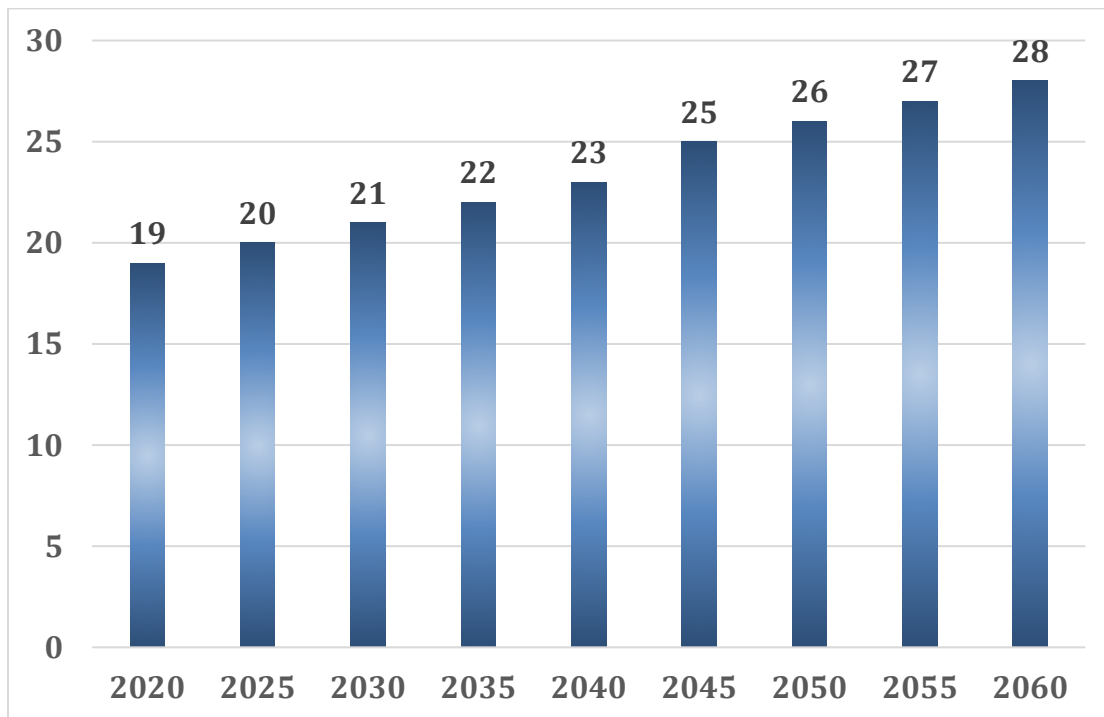


Figure 1. Projected Hispanic Population Growth (in percentage) by Year 2060 in the United States*

*Adapted from United States Census Bureau. (<https://www.census.gov/library/visualizations/2018/comm/hispanic-projected-pop.html>)