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COMMENTARY

The Complex Contributors to Obesity-Related Health Disparities: Introduction to the Special Issue

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The Obesity Health Disparities Research Center (OHDRC) at the University of Alabama at Birmingham is a National Institute on Minority Health and Health Disparities (NIMHD) center of excellence. Funded in 2017, the OHDRC expanded its focus in 2019 to include the Southeast region of the U.S. and partnered with 3 additional academic institutions: Louisiana State University, The University of Mississippi Medical Center, and Jackson State University. The OHDRC's research focuses on Blacks living in rural and low-income urban communities in the Southeast to positively impact the health disparities associated with obesity and related chronic diseases. The overall goal of the center is to reduce the health disparities in obesity between Blacks and Whites, thereby reducing other related health disparities in chronic diseases such as heart disease, cancer, diabetes, and stroke. To achieve this goal, the center supports transdisciplinary, multilevel, and multidomain research to understand the complex contributors to obesity-related health disparities, how they vary at critical periods across the life course, and how to develop interventions to address them.

Although the high overall prevalence of obesity in the U.S. is well documented, this risk is not evenly distributed across the population. Obesity disparities are evident among individuals of a minority race,[1] with lower income and education levels,[2] in certain geographic regions and rural areas of the U.S.[3] and are associated with specific neighborhood conditions.[4,5] For instance, Black adults have the highest prevalence of obesity among all racial/ethnic groups; 49.6% have obesity compared with their White counterparts, with Black women having the highest rates (56.9%).[1] In addition, geographic disparities are evident such that individuals residing in the southeastern U.S. and those living in rural communities are at increased risk for obesity.[3,6]

The prevalence of obesity and the associated disparities are consistent with similar disparities in various weight-related chronic conditions, including diabetes, hypertension, and cardiovascular disease.[7–11] Unfortunately, these vulnerable populations also experience poorer outcomes and higher mortality related to these chronic conditions.[12] A number of studies have documented attenuated obesity treatment response among certain groups. For example, Black adults may experience less weight loss than White participants in lifestyle interventions for obesity.[13–15] Furthermore, individuals with limited financial resources may have additional barriers to accessing evidence-based interventions for obesity and related chronic conditions. Despite this, many observational and intervention studies focused on obesity have included samples that lack adequate representation of these priority populations. Even fewer studies have specifically or exclusively focused on the prevention and treatment of obesity among these priority populations. Thus, additional work is needed to better meet the needs of these high-risk groups as well as improve the broader impact of obesity-related research and public health efforts on the basis of empirical findings.

A number of research priorities can be identified to address this unmet research and public health need related to obesity and associated health disparities. First, researchers, clinicians, policymakers, and other stakeholders would benefit from strategies to better measure and identify the modifiable and nonmodifiable risk factors for obesity as well as to more clearly understand the influence and interaction of these factors on obesity and related conditions. Certainly, the variables contributing to obesity are complex and multifactorial. These include biological/genetic factors, the social and cultural context, environmental constraints and resources, and

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psychological characteristics; behavioral constructs; and broader policy and regulatory environments.[16–20] Thus, rigorous and comprehensive methods are needed to fully capture these interrelated factors and better understand their influences on obesity, weight management, and the prevention and treatment of obesity-related conditions. In addition, further work is needed to identify effective, sustainable, and scalable prevention and treatment strategies that overcome the potentially unique barriers of priority populations to better meet their treatment needs and achieve more robust initial and long-term outcomes.

Typical biomedical research regarding obesity and its contributors has a physiologic focus rather than broader social, behavioral, and demographic factors. It is important to consider the social context of people's lived experiences when examining the drivers of obesity and developing interventions to address disparities.[21] In addressing the complex contributors of obesity and associated health disparities, the OHDRC supports research in a diverse range of domains of influence interacting with each other across varying levels of influence at crucial periods in the life course. This integrative approach accounts for multiple simultaneous forms of disease causation, including fundamental social, behavioral, and biological factors and recognizes that the interactions of contributing factors may operate differently at critical periods in one's life. The OHDRC builds on the NIMHD research framework[22] (Figure 1) and implements a regional approach to address health disparities in obesity and chronic disease in the Deep South.

Although the OHDRC includes programs and cores that are traditional for NIMHD Centers of Excellence, such as the Administrative Core, Investigator Development Core, and Academic-Community Engagement and Dissemination Core, what sets the center apart is its unique collaborations with institutions across the southeast. With its platform of regional collaboration, the center addresses obesity and chronic disease–related health disparities through the support of innovative resources for research and clinical care, mentored funding opportunities, and partnership with community coalitions. The center supports 2 research projects funded for the full 5-year duration of the center. The 2 projects, guided by the NIMHD research framework[22] and consistent with the life course approach, address obesity as a risk factor for chronic disease during pregnancy and in childhood. Together, the projects elucidate multidomain pathways through which multilevel influences create and perpetuate disparities in individual and family health while also testing novel interventions to reduce disparities.

In addition to the two 5-year projects, pilot studies of a 1-year duration were awarded to early-stage investigators with innovative ideas focusing on obesity and health disparities. The projects follow the OHDRC framework and use a multilevel, multidomain approach and target an area of the life course. Funded projects are listed in Table 1. Secondary Data Analysis concepts are awarded for a 6-month period. Funded concepts are listed in Table 2.

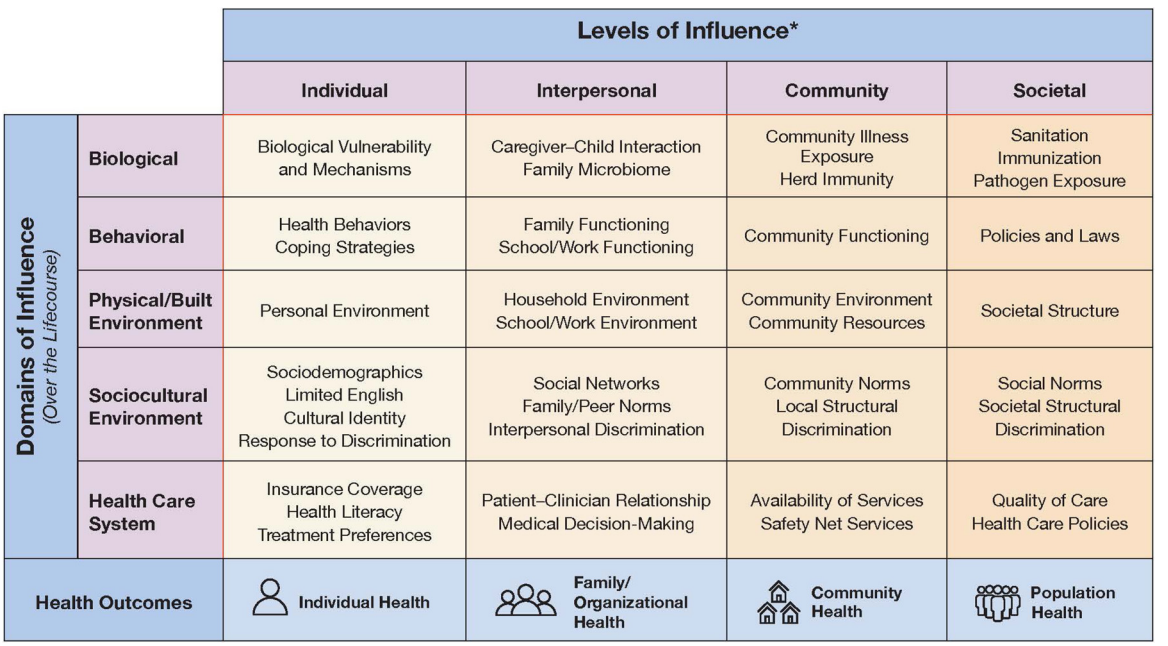

Figure 1. National Institute on Minority Health and Health Disparities research framework.[22]

Table 1. Pilot Projects Funded by the OHDRC.

Project title	Investigator
Serial assessments of body fat accrual in very preterm infants: a pilot randomized trial	Ariel Salas, MD, MSPH
Liver Surface Nodularity Score as a Noninvasive Biomarker for NAFLD	Andrew Dennis Smith, MD, PhD
The genomic landscape of obese cancer patients in minority groups	Zechen Chong, PhD
Modifying Diet and the Gut Microbiota to Reduce Obesity and Health Disparities	Tiffany Carson, PhD
The effects of natriuretic peptide (NP) augmentation on cardiometabolic health in African Americans with obesity	Pankaj Arora, MD, PAHA
Addressing the Obesity Health Hisparity Among Adults with Vision Impairments	Laura E. Dreer, PhD
TOSS Feasibility + Fitbit Community = Reduced Obesity in Older Black Women	Pamela G. Bowen, PhD
Using an Epigenomic Approach to Explore the Obesity-Pain Link among African-Americans	Edwin Aroke, PhD, CRNA
Obesity and Triple Negative Breast Cancer Disparities in Louisiana	Fokhrul Hossain, PhD
Who's Hurt Most by Economic Shocks? Obesity and Health After Major Financial Loss	Joseph D. Wolfe, PhD
Social Determinants of health, insulin resistance and poor COVID-19 outcomes	Carrie Howell, PhD
Obesity Exacerbates Pulmonary Complications in Children with Sickle Cell Disease	Ammar Saadoon Alishlash, MD, FAAP, FRCPCH
Epigenetic Age in African American Adolescents with Obesity	Christy Foster, MD

NAFLD, nonalcoholic fatty liver disease; NP, natriuretic peptide; OHDRC, Obesity Health Disparities Research Center; TOSS, Texting Older Sisters to Step.

The articles included in this supplement have perspectives situated within the NIMHD research framework, broadly representing outcomes across the life course and across the biological, behavioral, physical environment, and sociocultural domains of influence. This diverse and rigorous set of studies is organized into several broad categories of obesity and health disparities research. Although not mutually exclusive, these general areas include (1) social and biological determinants of health research, (2) behavioral research on obesity and health disparities, and (3) obesity and other conditions. Within each of these areas, several topic-focused manuscripts are included as well as more general obesity and health disparities research. One article describes the importance of using theoretical frameworks with a life course perspective when explaining the social factors associated with obesity. In addition, a longitudinal study assessed the young adult health outcomes related to adverse childhood effects, such as neighborhood poverty, discipline, and parental nurturance. Mrug et al.[23] found that poverty was significantly associated with lower cortisol levels and that supportive parenting with consistent discipline buffered adverse neighborhood effects on health. Another study by Hossain et al.[24] found that regardless of race, obesity was significantly associated with 2 subtypes of breast cancer (triple negative and luminal A

Table 2. Secondary Data Analyses Funded by the OHDRC

Concept title	Investigator(s)	Database accessed
Wealth and Obesity from Early to Late Midlife	Joseph D. Wolfe, PhD, and Elizabeth Baker, PhD	NLSY-79
Socioeconomic adversity, psychological distress, and obesity in HIV-positive women	Kaylee B. Crockett, PhD	WIHS
Racial Differences in 24-Hour Urinary Sodium Excretion: A Surrogate of Poor Cardiovascular Health Among US Adults	Pankaj Arora, MD	NHANES, 2014
Racial/ethnic disparity in relation to breakfast skipping and obesity/overweight prevalence and depression outcome: the Youth Risk Behavior Surveillance System (YRBSS), 2017	Azad R. Bhuiyan, MD, PhD	YRBSS, 2017
Evaluating the impact of COVID-19 on surgical outcomes in patients with obesity	Drew Gunnells, MD	UAB core COVID-19
Examining associations of social determinant of health (SDOH) clusters and obesity using electronic medical record data from an academic medical center in the Deep South	Carrie Howell, PhD	PRAPARE in the UAB EMR system

EMR, electronic medical record, NHANES, National Health and Nutrition Examination Survey; NLSY-79, National Longitudinal Survey of Youth 1979; OHDRC, Obesity Health Disparities Research Center; PRAPARE, Protocol for Responding to and Assessing Patient Assets, Risks, and Experience; SDOH, social determinant of health; UAB, The University of Alabama at Birmingham; WIHS, Women's Interagency HIV Study; YRBSS, Youth Risk Behavior Surveillance System.

subtypes), with particular risk for women with both obesity and diabetes. Two papers considered the relationship obesity may have played in coronavirus disease 2019 (COVID-19) outcomes: Howell et al.[25] found that neighborhood-level social determinants of health predicted the likelihood of hospitalization after a positive test, with race only becoming a predictor when included in the model with social determinants of health, whereas Shao et al.[26] found that postoperative mortality was almost 5 times higher for men, persons with higher BMI, and those with previous COVID-19 infection. In an additional paper, a secondary analysis found significant associations between obesity and financial stressors, specifically unsecured debt, bankruptcies, and property debt, at midlife.[27] The author suggested that targeting populations with high debt levels co-occurring with obesity could possibly reduce obesity disparities. An intervention study by Bowen et al.[28] was comprised a mobile Health and physical activity project, which found that text messages increased steps, decreased weight and waist circumference, but did not reduce HbA1c levels among older Black women. These articles are just a few of those included in this supplement and are representative of the University of Alabama at Birmingham OHDRC's emphasis on uncovering the contributors to disparities in chronic diseases and obesity across the life course and domains of influence. Results from these research efforts can inform health care and public health policy approaches that improve overall health and well-being.

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SUPPLEMENT NOTE

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