Obesity

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Toward Health Equity: A Workshop Report on the State of the Science of Obesity Interventions for Adults

Loneke T. Blackman Carr[1] | Jamy Ard[2] | Carmen Byker Shanks[3] | Evan M. Forman[4] | Stephanie P. Goldstein[5] | Debra Haire-Joshu[6] | Ania M. Jastreboff[7] | Shaneeta Johnson[8] | Namratha R. Kandula[9] | Peter T. Katzmarzyk[10] | Thomas C. Keyserling[11] | Shiriki K. Kumanyika[12] | Bruce Y. Lee[13] | Kristina Henderson Lewis[2] | Michelle Y. Martin[14] | Dariush Mozaffarian[15] | Robert L. Newton Jr.[10] | Angela Odoms-Young[16] | Emily Panza[5] | Nicolaas P. Pronk[17] | Lisa G. Rosas[18] | Carmen Samuel-Hodge[19] | Laura A. Schmidt[20] | Nancy E. Sherwood[21] | Bonnie Spring[22] | Kristen Cooksey Stowers[23] | Monica L. Baskin[24]

[1]Department of Nutritional Sciences, University of Connecticut, Storrs, Connecticut, USA | [2]Department of Epidemiology and Prevention, Wake Forest University School of Medicine, Winston-Salem, North Carolina, USA | [3]Center for Nutrition and Health Impact, Omaha, Nebraska, USA | [4]Center for Weight Eating and Lifestyle Science, Drexel University, Philadelphia, Pennsylvania, USA | [5]Department of Psychiatry and Human Behavior, Brown Alpert Medical School and Research, Brown University, Providence, Rhode Island, USA | [6]Brown School of Public Health, Washington University in St. Louis, St. Louis, Missouri, USA | [7]Department of Medicine (Endocrinology & Metabolism) and Department of Pediatrics (Pediatric Endocrinology), Yale Obesity Research Center (Y-Weight), Yale University School of Medicine, New Haven, Connecticut, USA | [8]Department of Surgery and Satcher Health Leadership Institute, Morehouse School of Medicine, Atlanta, Georgia, USA | [9]Division of General Internal Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois, USA | [10]Population and Public Health Sciences, Pennington Biomedical Research Center, Louisiana State University, Louisiana, USA | [11]Division of General Medicine and Clinical Epidemiology, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, North Carolina, USA | [12]Department of Biostatistics and Epidemiology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, USA | [13]Public Health Informatics, Computational, and Operations Research (PHICOR) and Center for Advanced Technology and Communication in Health (CATCH), City University of New York (CUNY) Graduate School of Public Health and Health Policy, New York, New York, USA | [14]Department of Preventive Medicine, College of Medicine, University of Tennessee Health Science Center, Memphis, Tennessee, USA | [15]Food Is Medicine Institute, Tufts University, Boston, Massachusetts, USA | [16]Division of Nutritional Sciences, Cornell Human Ecology, Cornell University, Ithaca, New York, USA | [17]HealthPartners Institute, Bloomington, Minnesota, USA | [18]Department of Epidemiology and Population Health and Department of Medicine, Stanford University, Stanford, California, USA | [19]Gillings School of Global Public Health and School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA | [20]Institute for Health Policy Studies, School of Medicine, University of California, San Francisco, California, USA | [21]School of Public Health, University of Minnesota, Minneapolis, Minnesota, USA | [22]Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois, USA | [23]Rudd Center for Food Policy and Health, Department of Allied Health Sciences, University of Connecticut, Storrs, Connecticut, USA | [24]Division of Hematology, Oncology, and Palliative Care, School of Medicine, Virginia Commonwealth University, Richmond, Virginia, USA

Correspondence: Loneke T. Blackman Carr (loneke.blackman_carr@uconn.edu)

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ABSTRACT

Objective: From October 18 to 20, 2022, the National Institutes of Health held a workshop to examine the state of the science concerning obesity interventions in adults to promote health equity. The workshop had three objectives: (1) convene experts from key institutions and the community to identify gaps in knowledge and opportunities to address obesity, (2) generate recommendations for obesity prevention and treatment to achieve health equity, and (3) identify challenges and needs to address obesity prevalence and disparities and develop a diverse workforce.

Methods: A three-day virtual convening.

Results: Several key themes emerged from the workshop discussions that describe directions to build on the currently limited amount of research on obesity, disparities, and equity. Key themes centered on the determinants of health, leveraging technology, clinical, community, commercial, and policy approaches. Community-engaged work, particularly in populations that have received little focus (e.g., sexual gender minorities, Asian communities), was also discussed.

Conclusions: Future research may be impactful when multilevel approaches are undertaken that leverage equity-minded tools and can be scaled up to meet community-informed population needs in a variety of settings. Funding priorities and workforce development will be critical to realizing health equity.

1 | Introduction

Differences in obesity prevalence in the United States (US) by demographic groups (e.g., race, ethnicity, sex, rural/urban residence) are generally acknowledged [1, 2]. However, minimal progress in understanding and resolving disparities in obesity prevention, treatment, and its consequences has occurred [3]. As obesity prevalence has increased within the general population, many population groups have experienced amplified disparities due to economic, social, structural, and environmental disadvantage [4]. While root causes of obesity disparities at the intra- and interpersonal levels have been thoroughly examined, less research has focused on organizational-, community-, policy-, and systems-level factors. This research gap has likely limited the effectiveness of obesity control interventions and strategies for some population groups.

The World Health Organization's (WHO) conceptual framework on structural and social determinants of health (SDOH) proposed that economic and political mechanisms give rise to a set of socioeconomic positions, whereby populations are stratified according to income, education, occupation, gender, race, ethnicity, and other factors. These socioeconomic positions in turn shape specific intermediary determinants of health status reflective of people's place within social hierarchies. Thereby, based on their respective social status, individuals experience differences in exposure and vulnerability to health-compromising conditions [5, 6]. Because structural and social factors are primary drivers of obesity disparities in the US [4], approaches rooted in health equity to advance obesity research that examines and addresses these factors are needed.

In October 2022, the National Heart, Lung, and Blood Institute (NHLBI), along with other Institutes and Offices of the National Institutes of Health (NIH), sponsored a workshop titled "Advancing Interventions for Adult Obesity to Promote Health Equity: State of the Science and Research Opportunities." The workshop engaged scholars conducting obesity and health equity research to critically examine the current state of the science and identify research opportunities to more effectively address root causes of disparities—especially those beyond the control of a given individual with obesity. The workshop's goal was to spur change in the conditions that propagate obesity disparities, thereby providing every individual equitable opportunities to engage in obesity risk reduction behaviors and receive appropriate treatment. This manuscript highlights key workshop themes and research opportunities.

2 | Obesity Prevention and Treatment: Key Themes in the State of the Science

2.1 | Social and Structural Determinants of Health and Obesity Interventions

SDOH are a lens through which obesity interventions and health equity can be discussed and understood. As one presenter framed our consideration of SDOH, "Are we talking about choice or chance?" Social determinants are the conditions and environments in which people live, work, and play that influence health and functioning [5]. Structural determinants, however, are socioeconomic, policy, and political factors that produce social stratifications and varied access to resources across groups defined by race/ethnicity, gender, and/or income, for example [5]. This results in groups and communities with limited access to services and opportunities, otherwise known as marginalized populations or communities. Marginalized groups (including racial/ethnic minority, sexual and gender minority, rural residents, lower income) also frequently experience higher burden of diseases [7].

An important shift to achieve equity in obesity interventions is to look upstream at SDOH as a system with both macro-level and individual impacts. This is relevant to clinical, community, and population interventions. Structural inequities can cause harm through institutions or social structures that prevent individuals from meeting their basic needs. For example, written and unwritten policies, laws, and practices such as racial residential segregation, discriminatory mortgage lending practices for Black and other marginalized populations, supermarket redlining, voter suppression, and environmental injustice are forms of structural racism that perpetuate inequity. Structural imbalances related to income, education, and geography overlap with, exacerbate, and foster inequities in obesity risk and treatment. These structural imbalances yield unfair treatment of and disadvantages among specific groups that can stymie efforts at behavior change and require focus in future intervention development.

Preexisting inequities across SDOH were both illuminated and exacerbated during COVID-19, particularly in the domain of economic stability. While the pandemic presented opportunities to conduct natural economic experiments as household income, tax credits, and food access increased and provided greater support to individuals and families, these policies were eliminated once the COVID-19 emergency declaration ended. Economic stability is linked to other obesity-related determinants like food security, nutritional habits, housing, and transportation. Continued federal, state, local, civic, and private sector investment in neighborhoods, food environments, housing,

Study Importance

- What is already known?
  - Disparities in obesity prevalence persist.
  - Modest impact to address disparities through research, prevention, and treatment has been made.
- What does this study add?
  - Equity in obesity treatment will require new approaches including novel theories and multilevel research, addressing social and structural determinant of health, leveraging technology to scale solutions, and community-engaged practices.
- How might these results change the direction of research or the focus of clinical practice?
  - Findings may inform funding priorities for research and workforce development.
  - Results may generate focus on key research areas to improve the effectiveness of treatment and prevention efforts.

[Correction added on 16 October 2025, after first online publication: Updates have been made to the Study Importance in this version.]

transportation, and business is needed to address preexisting societal stressors exacerbated during COVID-19 [8]. As one presenter described, SDOH are often interconnected and interdependent, a key perspective to remember when developing novel equity-focused interventions to address obesity (Table 1).

2.2 | Limited Obesity Research Centered on Systems

Obesity is a chronic neurometabolic disease with complex underlying biology that is impacted by systems-level issues [9]. The frame of obesity as a chronic, treatable disease and not a choice is a concept that has been understudied and consequently slow to benefit from systems-level approaches. A systems science perspective raises awareness of the wider context and interactions among different pathways influencing individuals, communities, and their health and leverages the potential of systems-oriented approaches to accelerate progress toward health equity while assessing and anticipating unintended consequences [10]. Thus, improving the impact of obesity interventions will require identifying, understanding, and intervening on system influences at psychosocial, behavioral, environmental, economic, and policy levels. Conducting systems-oriented research that identifies pathways between SDOH and obesity-related health disparities can inform future interventions.

One such example is the Moving to Opportunity study, where neighborhood poverty and several health outcomes, including obesity, were examined over 10–15 years [11]. In this study, mothers with low income living in public housing in high-poverty neighborhoods were randomly assigned to receive rent subsidy vouchers (to simulate potential government support and programming) and move to private housing in low-poverty neighborhoods. Study results revealed that families receiving subsidies had a significantly lower prevalence of extreme obesity compared to families with no subsidy who did not move. Research with sugar-sweetened beverage (SSB) policy provides a modern example of how a systems approach to improve nutrition may influence obesity-related health disparities. A simulation study was conducted to investigate a warning policy for SSB. Results showed that over 5 years, SSB and total calorie intake would decrease, followed by a reduction in obesity prevalence by 3.1% in the general population and greater reduction in racial and ethnic minorities [12]. This policy change also impacts manufacturers to avoid such labels through improvement of the nutrition quality of their food products [13]. Both examples demonstrate the potential of modifying the "big levers" of social determinants to impact obesity.

2.3 | State of the Art Interventions to Reduce Disparities

Across research, health care, and commercial (e.g., Weight Watchers) domains, contributions of past work and new directions to address inequities in obesity control were discussed. Within research, the contributions of seminal weight control trials (Diabetes Prevention Program, Look AHEAD) [14, 15] that remain the foundation of current behavioral practice in the clinical setting were situated with acknowledgment that the majority of trial participants were White and female, despite efforts to recruit more diverse participants. Suboptimal outcomes among some population groups (e.g., Black women) [16, 17] highlight a need to consider the relationship between the magnitude of weight change and health that may vary across subgroups and the need for new treatment approaches. In clinical settings, underutilized treatments such as obesity medications and bariatric surgery are generally effective options that may address obesity and related health disparities alike [18, 19]. Yet engagement of marginalized populations in effective obesity treatment across research and health care encounters remains a challenge [20].

While traditional clinical care and research models may not fully engage marginalized populations, commercially available obesity treatment could be positioned to do so. Commercial programs have the potential scale to deliver wide-reaching, evidence-based, and cost-effective treatment, as few physicians are currently equipped or trained to treat obesity. Through digital commercial modalities, intraindividual factors may be uniquely addressed as additions to current treatment. Subsidized participation in commercial programs through health care plans and employers can expand access to obesity treatment [8]. Subsidies can support individuals' initial engagement into commercial programs and have shown lower attrition compared to nonsubsidized participation in weight loss programs [21]. Importantly, across different levels of subsidy, comparable weight loss outcomes have been observed [19, 21, 22]. As such, lack of access to insurance and employer-based support is a key factor to consider [21]. Making equitable treatment through commercial programs an industry goal is critical to help promote a focus on acceptability, efficacy, effectiveness, and access for all that can address, rather than worsen, disparities.

Of note, singular goals and approaches for obesity treatment may not apply equally across groups for many reasons. For instance, Black adults with obesity are less likely to pursue obesity treatment and are less motivated by body dissatisfaction than their White counterparts [23, 24]. Alternative strategies like weight gain prevention ("maintain, don't gain") for Black women with

TABLE 1 | Key opportunities to advance equity in obesity treatment in adults.

Limited Obesity Research Centered on Disparities and Equity
• Develop theoretical models for systems change, not behavior change alone • Expand funding for systems science research and dissemination • Generate personalized interventions that account for social and economic disadvantages for people experiencing obesity and related health problems • Examine and account for the intersection of identities in race, ethnicity, gender, and social position
State of the Art Interventions to Address Disparities
• Combine existing datasets across weight management trials to examine weight reduction and health outcomes • Develop tailored interventions for marginalized groups experiencing obesity and related health disparities that account for social and economic disadvantages • Understand the impact of reallocation of health care resources to address health inequities
Weight Management in High-Risk Populations
• Promote interventions for specific comorbidities and multiple morbidities • Develop interventions that do not introduce or exacerbate disparities • Use policy as a lever to address disparities • Conduct multilevel interventions that focus not just on the individual but also on higher-level factors that impact behaviors and weight management • Measure social determinants of health, discrimination, and other variables that may influence outcomes to inform future studies where interventions are plausible • Understand the intersectionality of multiple identities (socioeconomic status, rural residency, gender) on obesity outcomes, which may reshape interpretations of results • Increase sample diversity across obesity treatments (medication, behavioral, surgical) • Understand how to scale evidence-based, culturally adapted, or tailored interventions • Increase obesity intervention research in primary care settings especially by integrating available technology (e.g., patient portals, digital scales) to deliver novel interventions • Provide broader and equitable access to obesity medicine specialists
Social and Structural Determinants of Health and Obesity Interventions
• Recognize that structural and social determinants of health (SDOH) influence individual behaviors within and across generations • Consider intersectionality of identities, as a "one size fits all" approach will not hold true for all • Focus on strengths and community assets versus a deficit approach • Develop tools to examine the impact of multiple, co-occurring policies and their equity impact • Investigate equity-focused methods for neighborhood investment and bolstering community capacity • Examine the mechanisms between neighborhood investment, diet, and obesity • Develop tools to evaluate the food and physical activity environments alongside other SDOH • Apply community-based participatory research methods and mixed methods to elevate community voices and maximize intervention impact
Technology, Research Designs, and Methods for Equitable Obesity Interventions
• Increase use of a systems approach and funding to develop methods • Train a workforce to use systems science with expertise in research on health disparities • Use the EHR to identify patients who would benefit from obesity medications or referral to bariatric surgery or to online weight management programs • Use the EHR to screen for SDOH and connect patients with evidence-based programs such as WIC and SNAP • Engage clinicians beyond PCPs (e.g., Ob-Gyn providers) with EHR-based tools to connect eligible patients with treatment options • Use SMART adaptive interventions that focus on efficacy as well as cost-effectiveness • Safely and responsibly leverage continuous digital monitoring and/or AI to personalize interventions to user receptivity and needs (e.g., just-in-time adaptive interventions) • Understand barriers to participant success utilizing both quantitative and qualitative data • Make workplace multilevel interventions accessible for all employees to benefit • Expand citizen science practice to focus on health equity and include individuals from diverse backgrounds • Leverage technology to collect, interpret, and present data in a compelling manner • Examine data integration and exchange between technology and the EHR to promote scalability across diverse populations • Recognize weight gain prevention as an appropriate second-line treatment that can be scaled • Evaluate coaching and other supports in combination with a digital approach • Develop digital interventions utilizing a community-engaged approach including partnerships • Leverage assets and trusted modes of technology (e.g., text message) while addressing populations' needs

(Continues)

TABLE 1 | (Continued)

Dietary Interventions and Weight Management for Health Equity
• Examine the role of diet quality in behavioral weight management interventions • Determine how to disseminate and translate dietary and weight management interventions in rural and/or high-risk geographies and among racial/ethnic minority groups (e.g., American Indians) • Develop approaches for resource-limited communities (e.g., limited internet access, no public transportation) • Design community-based interventions that address diet and optimize health in populations with health disparities • Integrate interventions within existing public health infrastructure, like health care, to create sustainable and scalable interventions • Develop and evaluate innovative interventions using the food is medicine framework to support nutrition security for all
Obesity Interventions in Special Populations With Health Disparities
• Assess sexual orientation, gender identity, and assigned sex at birth in obesity and cardiovascular health research and report on outcomes in these groups • Examine systemic drivers of obesity and cardiovascular health disparities among sexual and gender minority communities (e.g., minority stress) and their sequelae (e.g., food insecurity) • Expand research on obesity and cardiovascular health disparities among transgender people and gender expansive individuals (i.e., people who identify as a gender that falls outside the gender binary [e.g., nonbinary, genderqueer]) • Consider the assumptions that obesity and cardiovascular health interventions make about gender and sexual orientation and develop culturally relevant treatments • Use community-engaged approaches and qualitative methods to improve alignment between the research goals and community needs for sexual and gender minority communities with input from experts in working with these communities

overweight and obesity have been found to be both efficacious [25], and cost effective [26]. This approach may resonate with others who may be at high risk of obesity but who are not solely motivated by weight reduction.

2.4 | Weight Management Interventions in Populations at High Risk of Obesity

Black, American Indian/Alaska Native, and Hispanic populations, individuals with low income, those with multiple morbidities, and those living in rural areas represent some of the groups at high risk of obesity [1, 2]. Effective interventions that consider their unique needs are needed. Interventions that prioritize treatment for people with multiple morbidities have been suggested previously [27]. The primary care setting remains a central and familiar place to receive health care for individuals at high risk who live with obesity and other comorbidities. Therefore, obesity treatment within primary care is important to reach high-risk individuals where they are. The cluster-randomized PROPEL trial is one example of a primary care-based intervention [28]. Clinically meaningful weight loss was produced among participants, most with low income, in clinics randomized to receive intensive lifestyle treatment, compared to usual care [28].

Efforts to engage and co-develop effective obesity control interventions with marginalized populations at higher risk of obesity or with limited access to obesity treatment have been successful and show positive clinical outcomes [29–31]. Further, the use of trained community educators or community health workers to deliver interventions was also raised as a model to increase access to obesity treatment [30, 31]. It is important to consider SDOH, food insecurity, early adverse events, stigma, and other psychosocial factors. Further examination of multilevel interventions is needed to address the multiple factors that influence obesity outcomes [30].

2.5 | Technology, Research Designs, and Methods for Equitable Weight Management Interventions

Technology, big data, and innovative methods are areas where progress toward equity through obesity interventions can be advanced. When viewed as a systems issue that is complex in nature with interconnected parts, obesity can be better understood and addressed. Big data (defined here as a collection of datasets with higher volume, variety, and complexity) and computational power allow investigators to model obesity over time and simulate the impact of policy and changes in SDOH on weight-related behaviors and obesity. In a quantitatively oriented systems approach, big data and technology facilitate important opportunities to address equity through interventions.

The electronic health record (EHR), as a substantial big data source, should be more effectively utilized to enhance the equity of obesity interventions. The EHR can be used to screen for obesity, SDOH, and lifestyle behaviors in patients [32]. Because the EHR is optimized to streamline complex tasks, create scalable and systematic approaches to care management, and promote collaboration across providers, it can be leveraged to improve health care-based obesity treatment and prevention efforts. However, interventions that have focused on increasing diagnosis of obesity in the EHR have not translated into improved health outcomes or consistent referrals for weight management [33, 34]. Impediments to care include limited physician time, limited provider obesity treatment training, pressure to generate reimbursement revenue, and limited insurance coverage for obesity treatments. Importantly, increased diagnosis without pairing with assessment of and interventions to address SDOH may not effectively improve outcomes or inequities. Additional disparities in health care (access, insurance coverage) should be considered moving forward [35, 36]. Engaging providers and nonclinical staff, other than physicians, while using EHR-adjacent tools (e.g., patient portals) may be paths to identify adults with obesity and subsequently engage them through

technology-delivered weight management interventions. For example, in the PROPS study, participants were randomized to receive usual care, a HIPAA-compliant platform-based online weight management program, or the online program plus support [37]. The support included outreach from nonclinical health care staff to support patient progress and report to primary care physicians through the EHR [37]. The combined online program and support produced significantly greater weight loss compared to other study arms [37]. Such health care tools are vital for connecting adults to lifestyle interventions, obesity medications, or surgical methods of obesity treatment.

Workshop presenters also highlighted the need to reach all populations experiencing a greater burden of obesity. Technology can be integrated with trusted community institutions to deliver interventions. For example, churches may provide a setting where faith-based interventions can be combined with technology for weight management [38]. Whether a disparity-related digital divide remains problematic is an open question. Disparities in high-speed home internet connectivity persist, but their impact may have been reduced by pervasive smartphone and wearable use. Until recently, smartphone access in minoritized populations exceeded that in the general population [39]. In part, smartphones offered affordable internet access to households that could not afford broadband. Now, in addition to other attractions, smartphones offer app-based and text-messaging treatment programs for obesity, the ability to integrate self-regulatory feedback from wearable activity monitors and other Wi-Fi devices, and the ability to transmit these digital data in real time to a coach who can provide weight reduction counseling adaptively based on the incoming behavioral data. Remotely delivered, technology-assisted obesity interventions produce clinically meaningful weight reduction at low cost [40, 41] and are reimbursable as telehealth services in most states. They hold promise to benefit disenfranchised population groups to the extent that remote treatment delivery increases intervention reach and addresses some of the geographic, family, economic, and environmental challenges.

Technology may also facilitate novel approaches to tailoring treatments to address disparities. Artificial intelligence (AI) combined with continuous monitoring of digital data may be used to optimize intervention resources such that they are directed to those who need and respond to them [42]. For example, newer optimization research designs, such as microrandomized trials and control optimization trials, can be leveraged to develop just-in-time adaptive interventions that are triggered when environmental cues and/or internal states indicate both an opportunity for, and receptivity to, interventions [43]. These precise, dynamically tailored interventions step beyond adapting to differences *between* people in how they respond to a treatment. Instead, they adapt to dynamic changes within an individual in what is needed when, as revealed by continuously analyzed incoming digital data. The extent to which these methods can reduce disparities in weight control outcomes has yet to be tested, but the possibilities are promising because interventions can be triggered by multilevel internal and external determinants. Importantly, digital treatment alone may not be sufficient to produce meaningful results [40]. A human component within digital trials that is scalable and/or used by commercial entities is likely important and an area for future research. Presenters also cautioned future researchers to evaluate potential racism and other biases associated with machine learning and AI-based technologies as new solutions are examined [44].

Sequential multiple assignment randomized trial (SMART) is another optimization research design that can be used to develop decision rules that guide adaptive interventions. SMARTs answer questions such as what is the best initial treatment and whether, how, or when to alter treatment intensity, type, or delivery [45]. SMART results can shed light on how to tailor initial and subsequent treatment modalities based on social or individual factors. Importantly, SMARTs can be employed to optimize an intervention regardless of whether that intervention is technology-mediated [45].

2.6 | Dietary Interventions and Weight Management for Health Equity

Poor nutrition underlies a multitude of health issues, including those related to obesity [46]. During obesity treatment, behavioral interventions have largely focused on weight reduction through energy restriction and have generally not focused on a healthful dietary pattern that can assist with weight management and reduction of risk factors for multiple chronic diseases [46, 47]. For example, while seminal trials such as the Diabetes Prevention Program (DPP) and Look AHEAD achieved meaningful weight reduction employing an energy-restricted low-fat dietary pattern, these studies did not reduce cardiovascular events or risk; most of the weight reduction was not maintained long term. Thus, weight reduction interventions should promote dietary patterns that also reduce chronic disease risk, such as the Mediterranean diet and DASH dietary patterns [47, 48]. However, more study is needed on how to achieve socially and culturally tailored diets that incorporate the major principles of more healthful dietary patterns among US populations experiencing a greater burden of obesity and other chronic diseases.

Integrating dietary interventions into health care is supported by the emergence of the "food is medicine" approach. Broadly, this approach, coordinated by the health care setting or federal nutrition programs, provides patients medically tailored meals, foods, or prescriptions to treat and manage diet-related disease [49]. For example, WIC and the Gus Schumacher Nutrition Incentive Program (GusNIP) have a produce prescription initiative [50] focusing on populations with food insecurity or other social needs given the well-established association between food insecurity and obesity [51, 52]. Scaling this model will require an evolution from a focus on only achieving food security (quantity) to also achieving nutrition security (quality), with food that promotes and protects health, including obesity reduction [53]. Bolstering nutrition training for providers and strengthening and diversifying the nutrition workforce (e.g., registered dietitians) are needed.

2.7 | Obesity Interventions in Special Populations With Health Disparities

Cancer survivors, women of reproductive age, individuals from sexual and gender minority (SGM) communities, and Asian

populations in the US are population groups who have not been readily included in obesity interventions. Among cancer survivors, weight gain post diagnosis and an increased prevalence of overweight/obesity are documented issues [54]. Challenges to build evidence for this population include scalability and the current eligibility criteria of weight control interventions that typically exclude cancer survivors and thus systematically exclude them from obesity treatment.

Among women of reproductive age, Black and Hispanic birthing people are more likely to enter pregnancy with BMI in the overweight or obesity range and are at greater risk of postpartum weight retention [55]. Maternal weight management in DPP-based and/or adapted interventions is known to be effective, even among women exposed to under-resourced or impoverished environments. However, important gaps remain, including the need to address the structural and social conditions that impact the prevention and treatment of maternal weight gain [56–58] and how to implement interventions that address the root causes of inequities [59]. Furthermore, there are gaps related to family-based interventions. Specifically, while research has shown that fathers are important in promoting weight management in children, there are gaps related to the ideal balance of mothers and fathers as participating parents, the specific roles fathers are best suited for, and how father interventions differ by racial group [60, 61]. Furthermore, investigations into the effectiveness of family-based interventions are needed as they are delivered across settings (e.g., primary care) [62] and platforms (e.g., remotely delivered) [63]. Interventions such as these may serve as a means of overcoming socioeconomic disparities in childhood obesity.

SGM groups have also been overlooked in obesity treatment research. Sexual minority groups include individuals who report same-sex sexual attraction or behavior or who identify their sexual orientation as gay, lesbian, or another marginalized sexual orientation. Gender minority groups include people whose gender identity falls outside the gender binary (e.g., genderqueer, nonbinary) and transgender individuals (i.e., people whose gender identity differs from their sex assigned at birth). It is only in the past decade that measures of sexual orientation and those that distinguish gender identity from sex assigned at birth were added to population-based studies of cardiovascular health, and many obesity treatment studies continue to exclude these measures. This has led to large gaps in the research, but emerging work suggests cardiometabolic health disparities among SGM populations. High rates of obesity, cardiovascular disease, and metabolic disease have been observed in some SGM populations. Stressors related to minority status operating at the structural, community, interpersonal, and intrapersonal levels are implicated. For example, policies banning transgender participation in sports are linked to lower levels of physical activity in this population [64]. It is imperative for future research to assess sexual orientation, gender identity, and sex assigned at birth and report on outcomes to clarify mechanisms that drive health disparities and consider potential biases in treatment access. It is also critical to engage SGM populations in research. For example, an online behavioral weight loss intervention was recently culturally adapted to include sexual minority women's experiences using an iterative process with qualitative feedback and community input, and early findings show strong acceptability and outcomes among sexual minority women seeking weight management (K23MD015092).

The diverse social, cultural, and structural contexts of population groups such as US South Asians were illustrated during the workshop. In comparison to East Asian and non-Hispanic White populations, South Asians present with significantly higher rates of diabetes, hypertension, and coronary heart disease. South Asians experience a high prevalence of central adiposity [65], and obesity prevalence among South Asian immigrants increases with time in the US (e.g., second and third generation). Current approaches to weight loss fail to reach South Asians due to structural and sociocultural factors, including limited English proficiency, social and cultural norms [66], and health care access. To improve the reach, acceptability, and effectiveness of obesity treatments for diverse immigrant and Asian populations, community engagement and cultural tailoring are critical [65, 67]. Ongoing research examining cultural adaptation of cardiovascular disease risk reduction interventions to reduce weight and other risk factors may inform future work to promote the health of US South Asians and other immigrant groups [68].

2.8 | Community Engagement for Impactful Interventions

Community-engaged scholarship is necessary to understand and address obesity equitably through interventions [69]. Presenters discussed that to reach target populations where tailored interventions are important, qualitative methodologies are particularly useful in the formative phase. Such research informed an ongoing trial integrated with the Tribal Diabetes Program for American Indians, a community with high rates of diet-related disease [70]. Beyond the necessary formative phase, collaboration with communities that experience high burdens of obesity and diet-related diseases is critical to develop relevant, feasible, and sustainable solutions. These efforts may include the utilization of community advisory boards, community investigators and staff, and community involvement in the interpretation and dissemination of findings. Meaningful engagement can circumvent the challenges of deficit-based research focused on identifying gaps and problems in health and health behaviors [71]. By neglecting cultural relevance and within-group diversity, a deficit-based approach can make policy and systems-level change more difficult and generate findings that do not advance health equity. The deficit-based approach may also ignore assets that can be incorporated in obesity interventions and ignore the context underlying health disparities [72]. Community-based participatory research is regarded as the deepest level of community-engaged research, featuring shared leadership with those whose lived experience and expertise can inform an approach to research and promote health equity [73]. Advisory boards, lay health advisors, and patient navigators can help to identify and engage preexisting community assets. Community science methods also facilitate collaboration between scientists and community members throughout the research process [74]. Renewed pursuit of equity through obesity interventions presents an opportunity to apply novel methods utilizing available tools such as big data and adaptive interventions, with community-engaged research as a critical multisector approach to contextualize sustainable future treatment.

3 | Conclusion

Through this workshop, multidisciplinary experts convened to examine the state of the science in clinical, community, and population obesity interventions among adults experiencing health disparities. Numerous opportunities for future research to reduce obesity prevalence and improve successful responses to obesity treatments were identified. Broadly, the needs for future research include: (1) developing new frameworks and theories that integrate a systems-based approach to obesity, (2) measuring and addressing SDOH in interventions, (3) creating and using equity-minded policy and systems science tools, (4) conducting and evaluating multilevel interventions, (5) designing interventions to address multiple morbidities, (6) leveraging technology within and outside of health care settings and engaging various clinicians to deliver weight management interventions, (7) investigating how to bring obesity prevention and treatment to scale and in partnership with public health settings, and (8) using community-engaged and participatory methods to generate solutions for weight management among communities experiencing disparities. Given the preponderance of published literature on obesity prevention and treatment strategies focused on individual-level behavior change, there is a need for research considering how community, state, and national policies may improve or challenge the success of such programs among populations experiencing a higher burden of obesity.

To address disparities in obesity burden, structural shifts are required in the organizations through which research is supported. Greater funding for obesity-centered, systems-oriented health equity research and corresponding shifts in academic-based research are paramount. For example, there is a need for greater risk tolerance for innovation to support the testing of novel approaches likely required to realize health equity. Promotion of innovative approaches that support the necessity for community-engagement by investigators is also important. Relatedly, a focus on diversifying the scientific workforce that studies obesity will be responsive to the multiple identities and intersectional needs of an increasingly diverse nation. The innovation required to make meaningful progress toward health equity may emerge from promising early-stage investigators now entering the field.

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Conflicts of Interest

Dr. Ard receives research support from Nestle Healthcare Nutrition, Eli Lilly, Boehringer Ingelheim, UnitedHealth Group R&D, KVKTech, WeightWatchers, and Novo Nordisk and consulting fees from Nestle Healthcare Nutrition, Eli Lilly, Optum Labs R&D, Novo Nordisk, Intuitive, Regeneron, Brightseed, Amplifier Therapeutics, WeightWatchers, and Boehringer Ingelheim. Dr. Baskin has accepted honoraria from Johnson and Johnson Services Inc. Dr. Jastreboff conducts multicenter trials with Boehringer Ingelheim, Eli Lilly, Novo Nordisk, and Rhythm Pharmaceuticals and serves on scientific advisory boards for Amgen, AstraZeneca, Boehringer Ingelheim, Biohaven, Eli Lilly, Intellihealth (stock/stock options), Novo Nordisk, Pfizer, Regeneron, Scholar Rock, Structure Therapeutics, Terms Pharmaceutical, WeightWatchers, and Zealand Pharmaceuticals. Dr. Lewis reports nonfinancial support from KVK Tech for providing study drug for an investigator-initiated NIH-funded clinical trial, as well as personal fees from the American Board of Obesity Medicine. Dr. Mozaffarian serves on scientific advisory boards for Beren Therapeutics, Brightseed, Calibrate, Elysium Health, Filtricine, HumanCo, Instacart Health, January Inc., Season Health, Validation Institute, and WndrHLTH and has an unrestricted gift from Google. Dr. Johnson receives research support from Baxter. The other authors declared no conflicts of interest.

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

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