

## Review

# What works for obesity prevention and treatment in black Americans? Research directions

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Received 9 June 2014; revised 13 June 2014; accepted 14 June 2014

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## Summary

Obesity prevalence in black/African American children and adults of both sexes is high overall and compared with US whites. What we know, and do not know, about how to enhance the effectiveness of obesity prevention and treatment interventions in African Americans is the focus of the 10 articles in this special issue of *Obesity Reviews*. The evidence base is limited in quantity and quality and insufficient to provide clear guidance. With respect to children, there is relatively consistent, but not definitive support for prioritizing the systematic implementation and evaluation of child-focused interventions in pre-school and school settings and outside of school time. For adults or all ages, developing and refining e-health approaches and faith-based or other culturally and contextually relevant approaches, including translation of the Diabetes Prevention Program intervention to community settings is indicated. Major evidence gaps were identified with respect to interventions with black men and boys, ways to increase participation and retention of black adults in lifestyle behaviour change programmes, and studies of the impact of environmental and policy changes on eating and physical activity in black communities. Bold steps related to research funding priorities, research infrastructure and methodological guidelines are recommended to improve the quantity and quality of research in this domain.

**Keywords:** Ethnic groups, evidence base, research agenda, systematic reviews.

**obesity reviews** (2014) **15** (Suppl. 4), 204–212

## Introduction

The disproportionately high risk of obesity in black/African American<sup>1</sup> and other ethnic minority populations was recognized even before the emergence of obesity as a critical health issue in the US population as a whole (1–4) but without concurrent development of strategies to reduce obesity levels in the black population (5,6). This special issue of *Obesity Reviews* was undertaken to determine what is known about how to lower obesity prevalence in African Americans. Review topics were selected to provide

a range of perspectives on behavioural interventions related to eating patterns, physical activity, and weight control as well as environmental and policy change strategies to improve environments for healthy eating and activity patterns. The resulting articles (7–16) provide insights about prevention and treatment interventions in black children and adults, the efficacy and effectiveness of various approaches, and cultural adaptations. Interventions conducted in school settings, churches, other community settings and through the Internet are included.

As explained in the Introduction to the issue (17), these reviews were initially developed as background for deliberations at a 2012 workshop convened by the African

<sup>1</sup>We use these terms interchangeably.

American Collaborative Obesity Research Network (AACORN). The theme of the workshop was ‘What Works? What’s New? What’s Needed?’ to achieve healthy weights in black communities. Evidence from reviews included in this special issue addresses the question of ‘What works?’ This concluding commentary summarizes the nature of the evidence base generated from these reviews, key research directions that emerged from the findings and recommendations for future research (‘What’s needed?’).

### Why a focus on black Americans?

The need for focused efforts to identify and close research gaps related to obesity interventions in US black populations emanates from evidence that, compared with the white population, overweight and obesity prevalence are higher overall and across the body mass index (BMI) distribution, with some observations of time trends that are less favourable for black adults or children (18–22). Americans have the highest obesity prevalence when compared with peer countries (23), and the prevalence in blacks exceeds that in white by a significant margin. Moreover, there are empirical and theoretical reasons to question the effectiveness of the available interventions for preventing or treating obesity in black populations.

The higher prevalence is reflected in US National Health and Nutrition Examination Survey (NHANES) showing that 76.2% of black adults<sup>2</sup> ages 20 years and over compared with 67.2% of whites had BMI levels of 25 or greater (i.e. combined overweight and obesity; age-adjusted estimates). Obesity prevalence at or above the BMI 30 cut-off was 47.8% in blacks and 32.6% in whites. Obesity prevalence at the higher cut-off of BMI  $\geq$  35 (i.e. grade 2 and grade 3 obesity combined) was 23.3% in blacks and 11.2% in whites (22).

An NHANES report of the distribution of high BMI in children and adolescents ages 2–19 showed that 39.1% of blacks compared with 27.9% of white had BMI levels at or above the 85th percentile of the age–gender-specific Centers for Disease Control and Prevention growth standard (combined overweight and obesity); obesity prevalence (BMI at or above the 95th percentile) was 24.3% and 14.0%, respectively in black and white children and when defined at the  $\geq$ 97th percentile, was 18.6% and 9.8%, respectively.

With respect to trends, obesity prevalence in black women – already notably higher than in white women – continued to show a significant annual increase between 1999–2000 and 2009–2010, while no significant increase

was observed in white women (18). In men, there was a trend of increasing obesity overall and within each racial/ethnic subgroup, including black men, during this period (18). A statistically significant trend of increasing obesity prevalence during this period was also observed in boys ages 2–19 years but was statistically significant only among the black boys (21). A steeper rise in the prevalence of BMI at or above the 95th percentile was noted in black compared with white children in NHANES data for 1971–1974 through 1999–2002, e.g. a fivefold increase in black children ages 6 to 11 years compared with a threefold increase in white children, from the same initial prevalence of 4% (19).

Evidence that existing interventions are having less impact on the black population includes reports from several randomized clinical trials demonstrating that black men and women achieve smaller weight losses than white peers exposed to the same interventions and that trajectories of weight loss differ for blacks and whites (24–29). These findings suggest that lifestyle behaviour change programmes elicit lower levels of adherence in blacks than whites. Some reports of progress in stabilizing or reversing upward trends in childhood obesity prevalence point out that these signs of progress are absent for black children (30–32). These findings suggest that key interventions in populations at large may not be reaching black children in these populations.

Reasons for racial/ethnic differences in results of obesity-related interventions may include various interacting individual, programmatic and environmental influences (33–36). Potential individual-level factors include weight loss motivations, prior experiences with weight loss programmes, attitudes and preferences related to eating and physical activity, and parenting practices; these variables may be influenced by historical and social contexts. Environmental factors that might pose challenges for following advice to limit intake of high-fat, high-sugar foods or sugary beverages or to be more physically active can be characterized as physical, economic and sociocultural (37,38). ‘Information environments’ are also relevant. The repeated and often disproportionately high, in comparison to whites, exposure of black children and adults to ethnically targeted advertisements and promotions for high-calorie foods and beverages and sedentary forms of entertainment may effectively drown out health positive advice (39–42). Examples of these environmental challenges are shown in Table 1. Moreover, within black populations, the ultimate influence of and response to these personal and environmental variables potentially differs according to age or life stage, gender, socioeconomic status, and other demographic characteristics (34,36). Cultural targeting (i.e. directing specially designed interventions to black populations), as well as cultural tailoring (i.e. adapting intervention content and delivery for individuals or particular subgroups) is needed to address these differential responses (43).

<sup>2</sup>These data refer to blacks and white survey respondents who did not report their ethnicity as Hispanic. Many US Hispanics are white but data for Hispanics of any race are combined in the NHANES data and reported as a separate category.

**Table 1** Aspects of environmental contexts that may increase risks of developing obesity and decrease responsiveness to interventions

	Food related	Physical activity related
Physical environment	Limited access to full service supermarkets or large grocery stores Numerous fast food outlets Prominent advertisements for high-sugar, high-fat foods inside of stores and outdoors Limited availability of fresh fruits and vegetables Provision of high-fat, high-sugar foods in schools, workplaces and other community settings Lack of public transportation	Heavy traffic Poor air quality Lack of pedestrian and cycling pathways Concern about crime Limited access to high-quality parks and recreation centres Lack of safe and appealing school playgrounds
Economic environment	Unemployment or unstable employment Low incomes  Costs of healthier foods and promotion of less healthy foods at low cost Limited funds available for school meals  Prominence of fast food and soft drink companies as employers or funders of scholarships and community events and projects Cost of supervised pre-school and after-school child care	Costs of private gyms Marketing of digital devices and other sedentary forms of entertainment Limited local investment in parks and recreational facilities Lack of funds to hire trained physical education teachers in schools  Cost of supervised pre-school and after-school child care
Sociocultural environment	High-fat, high-sugar foods in traditional cuisine  Awareness of or experiences with food insecurity Childcare and food-related responsibilities of women Body image and perceptions that relatively large body size is the cultural norm High exposure to TV commercials for food	Cultural attitudes about physical activity and importance of rest Lack of social support or role models for active living Fears about safety or for child safety Gender norms about appropriate physical activity  Reliance on TV and digital devices for entertainment

Sources: See Swinburn *et al.* (37), Yancey *et al.* (38), Kumanyika (34,35), Grier and Kumanyika (40), Yancey *et al.* (41) and Grier and Lassiter (42).

### Size and quality of the evidence base

We defined 'relevance' to black populations according to whether the racial/ethnic composition of study participants could be identified and, if so, whether outcomes for blacks were interpretable in the reporting of study outcomes. The majority of studies cited in the reviews were designed to recruit only black participants or to recruit within black organizations and had at least 80% black participants. Studies in mixed populations with at least 50% black participants were also included in some cases. Other studies in which black participants were not in the majority but for whom outcomes were reported separately for black subgroups were included as well.

Some reviews were very inclusive with respect to study designs, throwing a wide net to capture promising evidence of any type, while others were very highly focused and limited the included studies according to strict criteria. The reviews by Samuel-Hodge *et al.* (14), on translation of the Diabetes Prevention Program lifestyle intervention, Wingo *et al.* (16), on black-white differences in outcomes of multi-centre trials funded by the National Institutes of Health, and the Kumanyika *et al.* secondary analysis of studies of

environment and policy change that had been rated for effectiveness (10), are examples of reviews to which very specific filters were applied.

We were aware from the outset that the body of evidence relevant to obesity interventions in black children or adults would be limited in comparison to what is available for white populations. It was, therefore, not surprising that the number of relevant studies identified in these reviews was relatively small. Together, the 10 reviews include 171 studies or study groupings (e.g. sets of articles from the same study), with a range of 6 to 28 in a given review. The number of unique studies across reviews is 144; 27 studies were cited in more than one review. The weight loss outcomes paper from the Diabetes Prevention Program efficacy trial (28) was cited in three reviews in addition to the Samuel Hodge review in which it was used as the gold standard (14). Two church-based studies (44,45) were each cited in three reviews. The other 24 studies that overlapped (which included other church-based studies) were each cited in two reviews (46–69). The greatest overlap was among reviews that focused on interventions in church settings, culturally adapted interventions and physical activity in adults. Based on the comprehensive search

strategies used, our impression is that the studies identified are a good reflection of the total amount of evidence available for the specified topics. Exceptions were the review of physical activity interventions (15), which updated previous reviews of the topic and limited their search to articles published since 2009, and the evaluation of evidence on environmental and policy change interventions, which focused on an existing database that only covered studies through May 2009 (10).

Besides the small number of studies identified, evidence on a given topic was heterogeneous, making it difficult to summarize or synthesize. Some of this was due to the use of different outcome measures or to inconsistencies in the way that outcome measures were reported. Authors also identified various study quality issues that further limited the utility of the available evidence. Foremost among these was the finding that many of the studies were pilot studies. Even pilots that were randomized controlled trials were of short duration. Other examples of study quality issues included lack of a stated theoretical basis for the intervention; failure to specify intervention goals (e.g. the desired amount of physical activity); failure to report on mediators or moderators of change; use of inappropriate measures to assess children's food intake; use of self-report data instead of objective measures of physical activity; and reporting of mean weight loss without also indicating the proportion of participants who achieved clinically significant weight loss. The evaluation of evidence related to environmental and policy changes identified numerous methodological issues that relate specifically to interventions that focus on programmatic or policy settings rather than individuals (10). These types of interventions and the study designs to evaluate them are relatively new; standards for the design and reporting of such studies are only now being established (70).

### Key themes and research directions

In spite of the limitations of the evidence base, several promising areas for the next phase of research on obesity-related interventions in black populations were suggested, as highlighted below.

- Well-designed and executed interventions can result in meaningful behavioural changes and positive weight and health outcomes in black adults in a variety of settings, but these interventions may be less effective when translated to community settings.

The Wingo *et al.* review provides strong evidence that lifestyle behaviour interventions in efficacy trials can result in clinically significant weight loss for black men and women, with associated improvement in cardiovascular risk factors (16). However, weight loss achieved by black participants is typically smaller than in white participants

in the same intervention (16). Weight loss in black participants is even smaller when programmes are translated to community settings (14). Reasons for smaller weight loss in community settings may centre around low or sporadic attendance and high dropout rates. Limited or sporadic participation reduces the effective dose of the intervention received. Research on factors that reduce attendance or participation can inform the development and testing of approaches that specifically address these variables. Studies that combine qualitative inquiry during the course of a study with quantitative process and outcome data (i.e. mixed methods studies) may offer advantages for identifying participation and adherence issues and understanding their importance.

- Studies to maximize the potential of interventions that reach black children in school and child care settings should be pursued.

The importance of interventions in school and early child care settings is well established, in part because such interventions have the potential for nearly universal reach to children and adolescents, and in part because of evidence supporting the effectiveness of such interventions in various populations (71). Three reviews in this issue have findings that support the potential for school and child care interventions to be effective with black children (7,10,13). What remains is to identify the most promising strategies for improving nutrition and physical activity, and to understand how to adapt strategies for maximum effectiveness in settings with a high reach to black children and adolescents. Needed studies include those that reach black children in ethnically mixed settings as well as studies in settings where black children are most or all of the population served. In addition, school-based and child care interventions that also influence the behaviours of parents and other family members will be critical for increasing the likelihood that healthful food and activity practices will be supported and reinforced within home settings. Based on an additional AACORN review that was discussed at the 2012 workshop and published before this special issue was developed, understanding how to influence parents is also an important direction for future research; the best ways to involve family members have not been identified (72).

- Cultural relevance is theoretically important but needs to be more clearly conceptualized, operationalized and assessed.

This finding potentially cuts across all types of intervention approaches and channels. The potential value of adaptations that take into account cultural and contextual influences on participation in behavioural interventions designed to alter eating and physical activity patterns and foster weight control was outlined previously. Attending to social and cultural contexts for eating and physical activity

in the design and implementation of obesity prevention and treatment research is advised on theoretical grounds (43,73) and has intuitive appeal. Interventions should strive to leverage social and cultural assets of black communities to foster healthy eating and active living rather than only view cultural influences as 'barriers' to be overcome. Approaches based in faith organizations may be particularly promising in this respect (11).

How to conceptualize and implement cultural adaptations, and whether adaptations improve outcomes, are key questions in several of the reviews in this issue and are the main focus of the review by Kong *et al.* (9). However, the evidence to date does not provide clear guidance as to the nature or degree of cultural or contextual adaptations that can increase intervention effectiveness (7,9,11,15,72). Outcomes of studies involving cultural adaptations are not necessarily better than those observed in non-adapted studies, although comparisons of these types of programmes are confounded by other differences in the interventions. Direct comparisons of culturally adapted and non-adapted interventions that are otherwise similar are few and difficult to implement. For example, conducting interventions within culturally specific settings is in itself an adaptation at some level. In such settings (e.g. churches), other cultural aspects of interventions may be difficult to limit to only intervention participants (45). Cultural elements may also be added spontaneously within interventions that target black participants. Adaptations through this route may not be recognized or reported.

More clarity and consistency are needed regarding how cultural and contextual adaptations are defined, what constitutes quality of implementation in this respect, and how they can be assessed and evaluated. There is an implicit question of whether cultural and contextual adaptation applies only or primarily to studies conducted in primarily black populations and, if so, what this implies for studies in mixed settings that involve black participants. These questions apply to interventions for which the setting itself is a cultural institution, e.g. black churches or black families, as well as other settings. Adapting intervention content and delivery for individuals within a setting (i.e. tailoring) may be important both within culturally specific settings as well as in ethnically mixed settings that include black participants.

- A research focus on interventions based on or including electronic communications may be very promising for reaching black populations.

As discussed in the Bennett *et al.* review (8), electronic communications (e-health) including through mobile devices (m-health), are having a major influence on the delivery of behaviour change interventions, and weight control interventions are no exception. The potential for

high impact using these technologies is multifaceted. There is the potential for reaching the large numbers of black youth and adults who use electronic communications for information gathering and social networking. As noted above, limited or sporadic participation can impact intervention dose and effectiveness; e- and m-health strategies could also be useful for addressing attendance/participation issues. Digital communications can facilitate bidirectional client-to-client and counsellor to client interactions. The potential to deliver interventions at low cost may be another benefit. Not only has this area of research received very little attention as it relates to black or other ethnic minority populations, but the evidence available is also out of date with respect to technological advances.

- Much more evidence is needed to inform the development of interventions to reach black men and boys.

Concern about the longstanding high rates of obesity in black women and the initially more dramatic increases in black girls than boys has limited attention to the effects of obesity in black males. In societies as a whole, greater concern about obesity tends to be expressed by or about females than males (74,75). The aforementioned signs of increasing obesity prevalence in black males underscore the need to give more priority to studies, or analyses within studies, of interventions that include or are directed to males.

A dearth of evidence related to interventions on obesity, nutrition and physical activity in black men is described in the review by Newton *et al.* (12), which focuses on this issue specifically, and is also evident in other reviews in this issue (11,15). Many studies in black adults and children and community settings have focused on females, and studies in adults that have included men have failed to recruit them in significant numbers (9,14). Representation of black men is perhaps most typical in efficacy trials that involve weight loss interventions as a strategy for reducing risks of hypertension or diabetes, e.g. as reviewed by Wingo *et al.* (16). Risk factor status is an eligibility criterion for these studies. Also, because weight loss counselling is often not the only intervention or randomization assignment involved in these studies, recruitment does not necessarily select for a strong motivation to lose weight. Representation of both boys and girls is typical in some interventions in children and youth (7,13,72) of which many are conducted in mixed gender, institutional settings such as schools. However, mixed gender studies do not always report results stratified by gender.

Some intervention approaches may work equally well in both sexes although the low recruitment of men argues that studies of ways to increase the reach of interventions to men should be undertaken. There are both theoretical reasons (e.g. because the psychosocial and sociocultural

contexts for behaviour and behavioural adherence differ for males and females) and empirical data to suggest gender differences in response to the same intervention (7,10,72).

## Conclusions and recommendations

Conclusions of authors of the separate reviews point to specific evidence gaps and methodological issues. Some authors provide recommendations for how to go about filling gaps in the topic areas they reviewed. We offer three further, overarching recommendations to augment the topic specific recommendations and the guidance provided in the highlights above with respect to research directions. These recommendations are intended to stimulate change in the field of obesity research as a whole. The limited evidence and tentative quality of most of the findings in the 10 reviews indicate that the problem goes beyond the spheres of influence or interests of individual researchers. We believe that improving the quality, quantity and effective translation of research to address weight-related issues in black communities, which is AACORN's goal, requires bold steps with respect to funding priorities and amounts, research infrastructure and methodological guidelines. The above research directions and the following recommendations derived from this AACORN-sponsored review build on recommendations for intervention research in the 2011 National Institutes of Health (NIH) Strategic Plan for Obesity Research (76) – both the general NIH recommendations and those that relate to research in ethnic minority populations – to provide a sense of urgency and more specificity about potential ways to maximize the impact of the research conducted going forward.

### Recommendation 1: increase the quantity of high-impact obesity-related intervention research with black populations

Research funders should give high priority to supporting and conducting studies of weight-related interventions with black children, adolescents and adults in clinical and community settings, emphasizing approaches likely to have high impact on prevention or treatment. High impact research is defined here as testing interventions with the potential to reach large segments of the black population using approaches that are feasible in urban or rural settings, facilitate institutional and behavioural change, and have long-term sustainability. Identifying high-impact research priorities and increasing the applicable proportion of obesity research funding devoted to addressing them will stimulate researchers to focus in these areas.

### Recommendation 2: improve the research infrastructure to support the type of research identified in recommendation 1

There is a tradition of funding research centres or programmes to create synergies for addressing critical clinical and public health questions. Such mechanisms should be used to fund a set of centres, perhaps one in each of several regions or major metropolitan areas, which can attract promising junior as well as mid-career and senior scholars and leverage their combined talents to generate solutions to obesity in the black population and, by extension, in other high-risk populations. Centres would need to be interdisciplinary and linked to community-based organizations, including healthcare organizations, in order to conduct effectiveness studies and natural experiments. Pilot and feasibility studies conducted in these contexts would have the support to advance to full-scale studies when appropriate. These centres could also be sources of methodology development and training programmes related to recommendation 3. Use of cooperative agreements that permit funder involvement would help to ensure accountability for developing and implementing strategic research agendas with high impact and for disseminating the results.

### Recommendation 3: identify and incorporate into research standards and training programmes guidance about approaches that can increase the relevance, specificity and value of research with black children or adults and other high-risk populations

It is expected that research with high-risk populations will be held to the highest methodological standards in general terms, as with any population. However, impact on specific high-risk populations such as black children or adults requires taking into account relevant influences on eating, physical activity and weight outcomes in responses to associated interventions. Presumed mechanisms of effect associated with cultural/contextual adaptations will need specification. Concepts and methods that take culture and context into account must generally become a part of the science of interventions. This includes articulation of cultural concepts in theoretical perspectives, either within existing frameworks or through triangulation of complementary sets of theoretical frameworks that cover the critical issues and pathways. Sample sizes, recruitment procedures, measurement approaches and other aspects of study design, analysis and reporting will require special attention to ensure that results for black participants will support robust inferences. Stronger study designs will also reduce the likelihood of publication bias towards only those studies that show positive results.

In conclusion, we were aware at the outset that the evidence base on interventions to improve obesity and related behaviours in the black population was inadequate. We allowed for assessment by specific topic rather than only globally so that areas with more or less evidence or better quality evidence could be identified. We viewed this effort to compile what is currently known about obesity interventions in black children and adults as valuable for setting a baseline at minimum and for raising awareness of research gaps. We also identified promising directions for research. Making recommendations for policy and practice was not feasible based on these reviews. However, efforts to derive recommendations for policy and practice using the best available evidence gleaned from a wider variety of sources (77) would be very useful to guide action in the interim while research on solutions catches up to the problems.

We hope that our efforts will contribute to understanding research needs and strategies related to obesity interventions in other understudied ethnic minority or socially disadvantaged populations. AACORN prioritizes efforts to improving the quality, quantity and effective translation of research on obesity and obesity-related behaviours and health outcomes in black communities. However, at a conceptual level, many of the issues relevant to obesity in black communities are also relevant to other ethnic minority populations both in the United States and elsewhere (78).

### Conflict of interest statement

The authors have no conflicts of interest to declare.

### Acknowledgement

This project was supported by a Robert Wood Johnson Foundation grant to the African American Collaborative Obesity Research Network (AACORN). The content is the responsibility of the authors and does not necessarily represent the views of the Robert Wood Johnson Foundation.

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