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Desire Resistance and Desire Reduction in Public Health Approaches to Obesity

Gareth R. Dutton, PhD, Kevin R. Fontaine, PhD, and David B. Allison, PhD

Nutrition Obesity Research Center, University of Alabama at Birmingham, Birmingham, Alabama

Obesity and Public Health

Obesity is a serious, chronic, and costly health condition.¹ Currently, approximately 35% of adults and 17% of children in the U.S. are obese², and among certain racial/ethnic sub-groups of the population, the prevalence of obesity is even higher.² Notably, these obesity levels increased markedly and monotonically during the second half of the 20th century.³ In response, a view emerged beginning in the mid-1990s that remains popular today and is well characterized by the following quotation from Novak and Brownell⁴: “Obesity is an epidemic that likely will worsen without substantive changes to the current environment. Although treatment of the individual has conventionally been the focus of the obesity field, prevention using a public health model will be essential for making progress on a population level.”

Thus, attention and resources have been allocated to develop and deliver interventions aimed at reducing obesity at the public health and community levels, and these interventions include a variety of approaches targeting public policy, the environment, and health behaviors.⁵ One emblematic theme in writings of such approaches is the idea of ‘nudges’ to the environment.⁶ The key idea here is that seemingly small changes to the environment (such as the placement of food within a buffet), that are minimally intrusive and perhaps not even noticed by the individual, nevertheless result in nearly effortless small changes in behavior such as less energy intake that, accumulated over many occasions, eventually has a beneficial effect on leading to lower weights than would otherwise have been achieved. Another similar approach is that there is some ‘right’ or ‘optimal’ way of eating, and if one can identify and eat in that manner, then weight will be lost (or less weight will be gained) without discomfort. This is a popular view in some of the literature on the effect of diet composition for weight control. This view is typified in some quotations from the influential book “*Good Calories. Bad Calories*” by Gary Taubes⁷ in which some who advocate a low-carbohydrate diet have described it as producing weight loss while “the patients never felt hungry” (page 318).

A key feature of writings on and approaches taken to obesity reduction at the population level seem to conclude that by making an appropriate change to the individual’s

Address correspondence to Gareth R. Dutton, PhD, 1717 11th Avenue South, Medical Towers 615, Birmingham, AL 35205, (205) 934-6876, gdutton@uabmc.edu..

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environment (whether that change is implemented by the individual or some larger societal element), the individual will weigh less than they would otherwise weigh, and this result will be achieved with little or no experience of deprivation. This perspective is quite different from common views incorporated into individual cognitive-behavioral or lifestyle interventions for individuals, which include that: (a) a conscious decision on the part of the individual may prompt behavior change; (b) an individual can make a deliberate decision to forego a desired behavior (usually food intake, but could also be sedentary behavior); and (c) in forgoing the desired behavior, some lack of satisfaction or discomfort may be experienced.

In this light, we offer the premise that many public health interventions can be placed into one of two general categories: ‘desire reduction’ and ‘desire resistance’. While these categories are not mutually exclusive, and certain features of both may fall on a continuum rather than a strict dichotomy, we suggest that most interventions can be described as having a predominance of either ‘desire reduction’ or ‘desire resistance’ strategies. These two categories of interventions differ in their emphasis and strategies for modifying weight-related behaviors. In the following sections, we suggest some working definitions of these two broad types of interventions followed by our rationale for this conceptualization. We then suggest that current thinking in the public health domain may be emphasizing ‘desire reduction’ well but underemphasizing, to near exclusion, ‘desire resistance’. Finally, we conclude by offering two potential hypotheses that could be tested along with some recommended guidelines for future investigations designed to test these ideas. The overarching goal is to increase the reach and benefits of public health interventions for obesity prevention and management.

Two Definitions

Some obesity reduction programs are designed to modify the environment and external cues to change individuals’ eating behaviors and level of physical activity. Examples include making school meals purportedly healthier or reducing access to sugar-sweetened beverages (SSBs) and energy-dense foods in school vending machines; limiting the available sizes of certain foods or beverages; increasing access to parks, sidewalks, and modifying other aspects of the built environment; promoting increased consumption of fruits and vegetables; and promoting different composition of diet. For this discussion, we label these types of approaches as emphasizing “desire reduction” (D-RED), which we define as efforts designed to eliminate or reduce exposure to high-risk situations in which energy dense foods may be readily available or sedentary behavior may be the typical response (see Table 1). These approaches purportedly decrease the desire to consume more energy or expend less energy, and/or to induce behaviors such as eating more fruits and vegetables or altering diet composition, which will purportedly reduce overall desired energy intake. It is proposed that, via such alterations, individuals will desire less energy intake (or less sedentarism) and therefore will be less likely to make purportedly obesifying choices (e.g., snacking on energy-dense foods, eating at fast food restaurants).

While some D-RED interventions may explicitly restrict access and availability of certain options (e.g., removing energy-dense foods from vending machines), other D-RED

strategies may have a less direct effect on excess energy intake. For example, public health campaigns promoting breakfast consumption, increasing fiber intake, or eating more fruits and vegetables have been promoted as weight-reducing interventions based on the rationale that ingesting these healthy alternatives will result in satiety and thereby reduce desire for purportedly more obesifying foods.

In contrast, the second broad category of interventions designed to remediate obesity can be conceptualized as relying on “desire resistance” (D-RES) strategies. Unlike “D-RED” that focuses on external cues and environmental modifications, “D-RES” targets individuals’ internal experience and skills for dealing with external challenges (e.g., encountering a buffet at a social event) or internal demands (e.g., food cravings, negative mood states). As the term implies, this includes skills that help individuals *resist* the desire to consume excess calories or to engage in sedentary behavior (see Table 1). D-RES skills include strategies such as self-monitoring, meal planning, asking for social support, wearing a physical activity monitor, cognitive restructuring, making a public social commitment, and preparing oneself to anticipate, tolerate, and accept feelings of deprivation when they are encountered.

Behavioral interventions targeting individuals (rather than communities, organizations, etc.) include a number of D-RES skill-building activities designed to help the individual reduce weight-increasing behaviors by learning to effectively cope with challenging situations involving food and/or activity. This is considered an important intervention target, because all individuals (both those attempting weight loss and those who are not) will experience: 1) genuine hunger, 2) social pressure to eat, and 3) genuine desire to be sedentary. In addition, a general dislike for exercise may be present for some, and most individuals will also experience cravings for particular foods, especially when highly-palatable foods are readily available. Indeed, individuals experience triggered impulsive processes when encountering highly-palatable foods^{8,9}, and interventions targeting food cravings and other initial impulsive responses have been shown to mitigate these automatic reactions and result in different choices, such as smaller self-served portion sizes of food⁹ and better self-regulation of food cravings among children and adults.¹⁰

One Premise

Our premise is that the majority of public health or community-level obesity interventions are based on D-RED as opposed to D-RES strategies.^{11,12} For instance, in the 2010 U.S. Surgeon General’s “Vision for a Healthy and Fit Nation”¹³, which summarizes public health initiatives to prevent and reduce obesity, six broad strategies are identified (see Table 2). Of these, one includes a focus on personal choices and habits, while most of the others are focused on “the social and physical environments that offer or limit opportunities for positive health outcomes.” These latter strategies are more consistent with D-RED that focuses on external cues and environmental modifications, which has also been described as initiatives that “help make the healthy choice the easy choice.”¹⁴ As illustrated in the informal summary of Table 2, D-RED strategies are disproportionately represented in these public health recommendations.

While D-RED strategies have value for reducing obesity, we contend that using these strategies almost exclusively may limit the beneficial effects of public health interventions. This is because it is impossible to eliminate all eating and activity-related stimuli from one's environment and all biological drive for energy intake beyond the level needed for maintaining a healthy weight. The idea that some level of discomfort or deprivation is expected, normal, or even desirable is commonplace in other domains. For instance, individuals engaging in fitness training are often told it will hurt (i.e., "no pain, no gain"). In teaching effective coping skills for anger management, no attempts are made to create conditions in which anger is never experienced. Rather, individuals are instructed that anger is a normal human experience that requires an appropriate response when anger-inducing situations are encountered.

In the same way for obesity reduction strategies, some level of D-RES (i.e., deprivation) may be required to make choices that effectively limit excess energy intake and increase energy expenditure. Therefore, we suggest that D-RES strategies are a missing (or at best underutilized) element of many public health interventions, and increased efforts to incorporate D-RES in conjunction with existing D-RED strategies may improve outcomes for public health and community-level programs targeting obesity.

Two Hypotheses

Based on our premise that most public health obesity interventions are a "missed opportunity" for bolstering D-RES, we offer two hypotheses regarding D-RES and D-RED imbedded within public health approaches for obesity reduction. First, we hypothesize that including D-RES will have an incremental beneficial effect. In other words, an intervention that already includes D-RED, which then adds D-RES strategies as well, will have an incremental improvement in effects by layering this new approach (i.e., D-RES) onto the existing, conventional one (i.e., D-RED).

The second, alternative hypothesis is that adding D-RES strategies to an intervention that also includes D-RED will modify the effect of D-RED alone. More specifically, introducing D-RES may amplify the effects of D-RED. This latter hypothesis proposes an interactive effect of D-RED and D-RES strategies incorporated into the same intervention. In an extreme version of this hypothesis, D-RED strategies alone might be hypothesized to have no effect, whereas when combined with D-RES strategies, D-RED strategies might have a beneficial effect. These two hypotheses are non-competing, meaning that both could be correct. Of course, either or both of them could be incorrect. Thus, these hypotheses should be subjected to empirical evaluation. In the next section, we briefly outline some basic parameters and assumptions that should be considered when designing investigations to test these hypotheses.

Future Research

While we do not intend to detail specific experiments that would test the hypotheses forwarded here, we do offer some general considerations that may inform the development, implementation, and interpretation of future studies in this domain. First, to most suitably test these hypotheses, we advocate for experimental designs including randomization to

treatment conditions. While this can prove challenging on a public health, community-level scale, this is the strongest design to meaningfully inform future decisions about public policy for the content and delivery of obesity prevention and reduction programs.^{15,16}

Also, researchers should carefully consider the population targeted for these interventions, as results may vary for individuals actively pursuing weight loss versus those who are obese but not currently considering weight loss. Many public health interventions do not selectively distinguish between these sub-groups when delivering community-level obesity programs, so it is important that future research clearly define the target population so future findings can be appropriately compared to previous public health interventions.

Just as results may differ based on individuals' interest and engagement in weight loss efforts, results may also differ for interventions targeting adults and children. It is possible that the influence of D-RES, D-RED, and/or a combination of these two approaches may differentially influence the behaviors of young children, adolescents, and adults. For instance, some approaches may be most impactful for young children, while other approaches may yield the greatest benefits for adults. Of course, this is speculative at this point but certainly deserving of additional consideration.

Finally, as with any obesity intervention, the duration and intensity of treatment as well as the duration of study follow-up will be important factors in the interpretation and impact of study findings. Intervention effects observed initially at short-term follow-up often dissipate over time and may be absent at extended follow-ups. Also, whether interventions target individuals' behavior change primarily through D-RES, environmental modifications through D-RED, or some combination of the two, the level and type of contact must be carefully considered, weighing the program intensity that is required to modify behavior balanced against the practicality and sustainability of such a program.

Conclusion

In conclusion, while we agree that it is important to test potentially useful public health approaches to reducing population and community obesity levels, we believe that the current zeitgeist seems focused on D-RED strategies to the near exclusion of D-RES strategies and hypothesize that doing so may be relatively ineffective.

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Table 1

Desire reduction and desire resistance obesity interventions: Summary of key concepts

Desire Reduction (D-RED)	Desire Resistance (D-RES)
<ul style="list-style-type: none">• Eliminates or reduces exposure to high-risk situations	<ul style="list-style-type: none">• Strengthens ability to resist unhealthy responses in high-risk situations
<ul style="list-style-type: none">• Modifies environmental/ external cues	<ul style="list-style-type: none">• Enhances individuals' ability to manage external challenges
<ul style="list-style-type: none">• Decreases desire to consume excess energy or expend less energy	<ul style="list-style-type: none">• Increases ability to consume less energy or expend more energy
<ul style="list-style-type: none">• Relatively 'painless' changes, which may go unnoticed by individuals	<ul style="list-style-type: none">• Some level of deprivation or discomfort often required

Table 2

Summary of U.S. Surgeon General's 2010 Recommendations for Preventing Obesity

General Recommendation	Specific Intervention Examples	D-RED, D-RES, or Both
1. Individual healthy choices & creating a healthy home environment	<ul style="list-style-type: none"> • Shop for and prepare healthy meals, including entire family • Control portion sizes • Limit screen time • Remove TVs from bedrooms 	Both
2. Creating healthy childcare settings	<ul style="list-style-type: none"> • Require structured and unstructured daily activity • Establish nutrition requirements for childcare facility 	D-RED
3. Creating healthy schools	<ul style="list-style-type: none"> • Ensure availability of healthy food options and water • Limit high-calorie snack and beverage options in vending machines 	D-RED
4. Creating healthy worksites	<ul style="list-style-type: none"> • Establish worksite wellness programs and challenges • Provide onsite facilities for activity programs, walking paths, etc. • Make healthy food and beverage options available 	D-RED
5. Mobilizing the medical community	<ul style="list-style-type: none"> • Assess and record patients' BMI, activity, and dietary patterns • Educate healthcare providers and students on lifestyle counseling 	Neither are explicit
6. Improving our communities	<ul style="list-style-type: none"> • Improve availability of supermarkets in underserved areas • Limit food and beverage advertisements • Improve access to outdoor recreational facilities 	D-RED