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A Middle-Range Theory of Social Isolation in Chronic Illness

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Abstract: Chronic illnesses and social isolation are major public phenomena that drive health and social policy worldwide. This article describes a middle-range theory of social isolation as experienced by chronically ill individuals. Key concepts include social disconnectedness, loneliness, and chronic illness. Antecedents of social isolation include predisposing factors (e.g., ageism and immigration) and precipitating factors (e.g., stigma and grief). Outcomes of social isolation include psychosocial responses (e.g., depression and quality of life), health-related behaviors (i.e., self-care), and clinical responses (e.g., cognitive function and health service use). Possible patterns of social isolation in chronic illness are described.

Keywords: chronic disease; social isolation; social interaction; loneliness; nursing theory

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1. Background

Social isolation is a powerful determinant of poor health, with a significant impact on morbidity and mortality in populations worldwide [1,2]. In adults, about one in ten individuals experience social isolation, with sociodemographic and socioeconomic factors influencing prevalence [3].

The high prevalence of chronic illnesses has increased the risk of social isolation [4]. Given that chronic illnesses are more prevalent in middle-aged and older individuals, this population is particularly susceptible to social isolation during their disease trajectory [5]. Moreover, the impact of isolation on individuals with chronic illness is generally worse than that of a healthy population [4]. Specifically, the onset of social isolation in people with a chronic illness is complex; health problems can alter one's social network; for example, these individuals may view themselves as different from healthy persons due to disabling symptoms and related discomfort, or struggle to engage in social activities due to a lack of energy. As a result, the ill person may lack emotional support and experience loneliness [6].

Social isolation was also greatly exacerbated by the Sars COVID-19 pandemic. Due to the need to curb mortality and morbidity caused by this infection, governments around the world have been urged to take extreme restrictive measures, such as home isolation, and quarantine. Not only has this intensified loneliness [7], but also disrupted chronic care due to the postponement of scheduled medical visits, and delayed care seeking [8].

Although there is ample literature that describe the phenomenon of social isolation across the world [9], the knowledge on how this process is engendered in chronically ill individuals remains understudied. Middle-range theory can be derived from grand theory, developed inductively from qualitative research, or derived through logical analysis and synthesis [10]. This middle-range theory was developed deductively through an extensive review of theoretical and empirical literature, with the goal of explaining the onset and outcomes of social isolation in chronic illness.

Middle-range theories are essential in nursing research because they strengthen the scientific base of the nursing discipline and are close enough to observed data to permit the incorporation of propositions for empirical testing, thus guiding clinical practice [10]. In this paper, we outline the building blocks of the theory, including concepts, assumptions, propositions, and the logic of the phenomenon of interest. The implications for nursing practice and research are discussed.

2. Operational Definition of Concepts

The core concepts of this middle-range theory are social disconnectedness, loneliness, and chronic illness. The first two concepts are often studied in tandem in empirical research and are embedded under the umbrella term social isolation. The term social isolation captures a dense, multi-dimensional construct, reflecting the structural and functional aspects of social engagement or relationships [11]. Chronic illness represents the context in which the phenomenon of social isolation is described in this middle-range theory.

2.1. Social Disconnectedness

The seminal work of Cornwell and Waite (2009) defines social disconnectedness as an objective measure of social isolation that reflects physical separation from other individuals. Drawing on the indicators collected by the National Social Life, Health, and Aging Project (NSHAP) [12], this theory considers disconnectedness as a composite of the domains of social network characteristics, living arrangements, number of friends and family members, and degree of social participation (Table 1).

Table 1. Domains and description of the indicators of social isolation (adapted from Cornwell and Waite (2009) [12].

Measure	Domain	Indicator/Description
Social disconnectedness	Social network characteristics	Social network size
		Social network range
		Amount of social network members
		Average frequency of interaction with network members
		Average closeness with network members
	Living arrangements	Household size
		Living alone
		Spouse or current partner
	Number of friends and family members	Number of friends
		Number of children
		Number of grandchildren
	Social participation	Attending religious services
		Attending meetings of an organized group
		Socializing with friends and relatives
		Socializing with neighbors
		Volunteering activities
Loneliness	Emotional loneliness	Lack of an attachment figure to rely on
	Social loneliness	Lack of a larger social network

A person affected by a chronic illness is at risk of experiences that lead to alterations in indicators of objective social disconnectedness. For example, the level of engagement allowed by the illness can compromise social contacts. Second, the persons with whom the ill individual shares particular activities may withdraw because they can no longer share them. These alterations are particularly problematic because chronic illness may impose a greater need for social support [13].

2.2. Loneliness

Loneliness is defined as an unpleasant subjective experience in response to social isolation, determined by the perception of a discrepancy between the relationships one expects

and the objective relationships one has [14]. This theory adopts the operationalization theory proposed by Weis (1973) [15], in which loneliness is described in terms of its emotional and social dimensions. Emotional loneliness is the perceived lack of an attachment figure and someone to turn to (e.g., a partner or a best friend), while social loneliness refers to the absence of a broader network of friends and other acquaintances that can provide a sense of belonging, companionship, and feelings of being a member of a community. An ever-expanding body of literature indicates that people with chronic illnesses are more predisposed to feelings of loneliness than healthy individuals [5], as described below.

2.3. Chronic Illness

In this theory, we adopt the term chronic illness, defined as a multidimensional construct that captures not only the presence of a long-term biomedical alteration, but also the individual experience of living with a chronic disease. Experiences are referred to as the psychosocial aspects that a chronic illness engenders, such as social isolation and social stigma.

3. Antecedents of Social Isolation

Several factors can increase the likelihood of developing social isolation in people with a chronic illness. In this theory, we classify them as predisposing and precipitating factors (Figure 1).

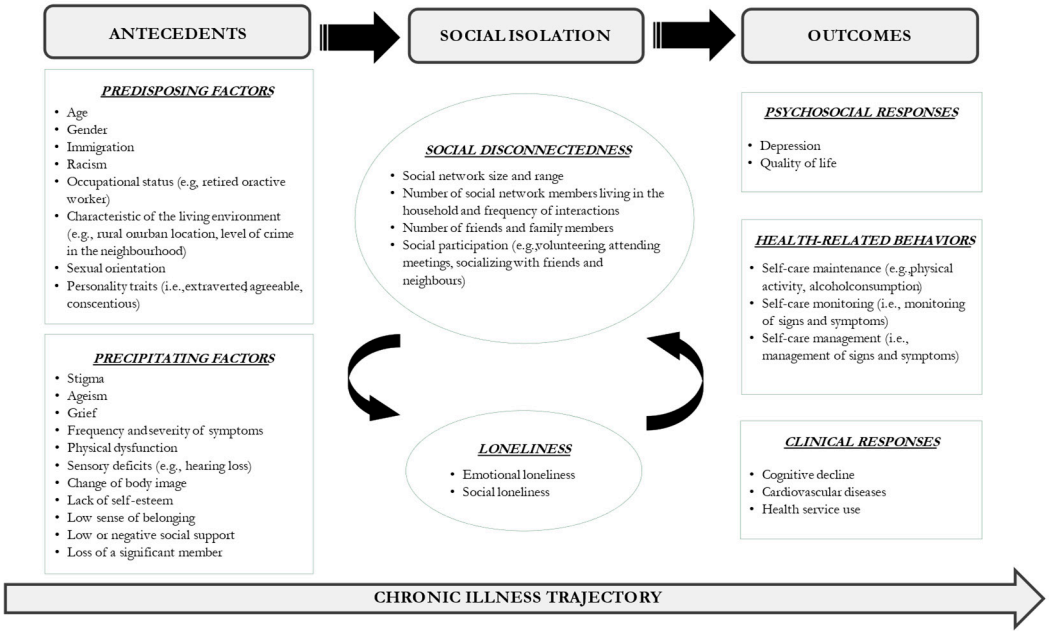

Figure 1. Pictorial model of the middle-range theory of social isolation in chronic illness.

3.1. Predisposing Factors

The predisposing factors to social isolation are defined as preexisting conditions and include age, gender, immigration status, occupational status, living environment, sexual orientation, personality traits, and genetic predisposition. Abundant evidence indicates that social isolation is relatively more frequent in older adults [16]. The main reasons for this higher prevalence can be attributed to an intrusive illness that affects activities of daily living, retirement, or the loss of loved ones (e.g., spouse, family member, or friends) [17]. As described in the subsequent paragraphs, age indirectly affects social isolation via other factors (e.g., ageism).

Social isolation also varies according to gender; in fact, women have been found to have broader and stronger social networks than men [18]. Another important predisposing factor is immigration status; evidence suggests that immigrants are more predisposed

to social isolation than non-immigrants, probably linked to stressors such as language barriers and differences in cultural background [19]. Importantly, this population is also more likely to be exposed to discrimination and racism, which trigger personal insecurity towards social interactions and social participation [20]. Racism is a problem not confined to immigration; extant literature suggests that this phenomenon also affects White individuals, with serious consequences, including emotional reactions and feelings of loneliness [21].

Employment can protect against loneliness [22] because it requires less self-directed effort to remain socially engaged. Low income is another predisposing factor to loneliness. Cohen-Mansfield, Shmotkin, and Goldberg (2009) [23] prospectively studied older people and found after 3.5 years that loneliness occurred mainly in those reporting limited financial resources, probably due to the imposed limits on specific leisure activities (e.g., trips, outgoings and hosting friends at one's residence).

Environmental factors can also facilitate social interaction; in general, living in an urban rather than a rural location is favorable, due to the greater availability of social resources, whereas the neighborhood crime level negatively impacts social interactions due to the perceived threats to safety [24]. However, different living environments can impact the lives of people affected by chronic illnesses; for example, a specific health issue can exacerbate feelings of living in a high-crime neighborhood, making them more reluctant to leave their residence. Another factor that exacerbates social isolation may be no longer driving due to a decline in physical health. This can be an important issue for people who live in places with few transportation options [16]. Another factor that influences social isolation is the healthcare environment itself; for example, long-term care residences can increase or decrease isolation, depending on factors such as the provision of home-like accommodations, ease of contact with family and friends, presence of technology, and comfortable private spaces [25].

There is evidence that different personality traits predict social isolation. For example, Iveniuk (2019) [26] found that extraverted and agreeable people had larger and stronger social network ties than their counterparts; however, other personality characteristics (i.e., conscientiousness) can be positive in relation to social network outcomes [27].

3.2. Precipitating Factors

Precipitating factors are risk factors that, in clusters or alone, trigger the onset of loneliness or social disconnectedness. Many of these precipitating factors are unrelated to chronic illness, but they make coping with an illness relatively more challenging, such as the loss of a significant social network member. Other precipitating factors are directly related to chronic illness, reflecting the extent of the physical and psychological intrusiveness of the illness itself. These factors include stigma, grief, the frequency, severity, and bothersomeness of symptoms, physical dysfunction, sensory deficits, body image changes, lack of self-esteem, low sense of belonging, and poor quality social support, as discussed below.

Stigma across individuals with chronic illness represents a growing area of research; evidence in this field suggests the high complexity of this construct across those living with invisible illnesses. This group can experience stigma in the forms of anticipated (i.e., expectations of stigma experiences in the future), internalized (feelings of self-directed prejudice caused by absorbing negative stereotypes from society), and enacted stigma (i.e., the experience of unfair behavior perpetrated by others) [28]. The characteristic of invisibility of chronic illness offers the key to explain the possible dynamics of isolation onset; firstly, the society can act by discrediting and devaluing the person, as a result of perceiving their symptoms as "exaggerating"; secondly, the chronically ill individuals may react by starting to adopt coping secrecy and social withdrawal. This further reinforces internalized stigma, thus perpetrating stigma-related social isolation [29]. A more subtle but frequent form of stigmatization is also represented by the experience of pity or compassion conveyed by family members and friends [30].

Ageism is another precipitating factor for isolation, given that it is relatively similar to stigma. Ageism is defined as the negative stereotypes, prejudices and discriminations

toward old age and the aging process. Although it is still a relatively understudied concept, ageism can be an important risk factor for late-life loneliness, through a mechanism of social rejection (e.g., mandatory retirement) and stereotype embodiment (i.e., negative self-perception of aging due to stereotypes) [31]. The resultant isolation can be worsened in the presence of an intrusive illness that leads to one's deterioration of physical health (e.g., compromised mobility).

Grief is an emotional reaction commonly associated with chronic illness. A recent overview describes grief as an adjustment process complicated by the flare-ups of symptoms, progression and incurability of the illness, and related impairments. The consequences of an active grieving state are hostility, low self-esteem, and self-isolation [32].

Low self-esteem is common in patients with chronic illness [33]. Low self-esteem is related to negative social comparisons, feelings of inadequacy, and excessive self-criticism. Furthermore, some chronic illnesses lead to alterations in body image (e.g., obesity, psoriasis and mastectomy with breast cancer) and physical function. The emotional reaction resulting from these illnesses, together with the anticipated stigma, triggers a progressive decline in self-image and self-esteem [34], which becomes the basis for exclusion from a range of daily social interactions.

A sense of belonging, defined as the extent to which an individual feels connected to and part of the social community [35], can deteriorate with chronic illness due to experiences of social detachment, self-blame, alienation, and social stigma [36]. In this situation, the ill individual may have many contacts and experience interactions, but does not feel part of the community.

Finally, a lack of emotional and instrumental social support can be considered as a precipitating factor because chronically ill people (especially older adults) rely heavily on family members and friends to cope with their health problems (i.e., informal caregivers). The Salutogenic Model posits that social support is particularly important in boosting generalized resistance resources and adaptively coping in stressful situations [37]. Social interactions and relationships are a source of emotional and instrumental social support. In conditions with physical and psychosocial needs, such as at the onset or during the exacerbation of a chronic illness, reciprocal communication and tangible help are fundamental. Lack of perceived support (e.g., from an intimate caregiver or another family member) is traumatizing for chronically ill people due to the ensuing unmet needs, which can precipitate feelings of loneliness and depression and worsen physical health [38].

It is important to emphasize that precipitating factors can be multiple or recurrent events that trigger the onset of social isolation, especially when they coexist with the predisposing conditions. For example, a person living in a rural area can work to preserve social connections despite a scarce social network. However, if the illness has made the person feel vulnerable or fragile, and they live in a high crime area, they may refuse to leave the residence and engage with others for fear of violence. In this case, the intrusiveness of the illness can precipitate social isolation. Another example is a healthy homosexual individual who, due to stigma, experiences minimal social connectedness but does not feel lonely. If this person develops a stigmatizing chronic illness, the additional stigma (or self-stigma) can aggravate the original stigma related to sexual orientation, thus exacerbating the loss of social contacts and sparking feelings of loneliness.

4. Outcomes of Social Isolation

Social isolation influences the health outcomes of persons with a chronic illness through a complex, interconnected network of pathways. We classify them as psychological responses, health-related behaviors, and clinical responses.

4.1. Psychosocial Responses

The first group of outcomes of social isolation is the psychosocial domain (Figure 1). There is evidence of a significant association between social isolation and depressive symptoms [39]. However, a more in-depth critique of the literature suggests that this

evidence is weak [40]. Longitudinal studies have shown that greater loneliness at baseline predicts depression over the subsequent five years [41,42]. Another longitudinal study of more than 1000 young adults [43] found that disconnectedness and loneliness were both associated with depression. However, when entered simultaneously in a regression model, the effect size for loneliness did not substantially change. At the same time, that of social disconnectedness decreased considerably, suggesting that loneliness can be a mediator in the relationship between social disconnectedness and depression. Social isolation is also a well-known risk factor for poor quality of life, for which there is robust literature [44,45].

4.2. Health-Related Behaviors

The second group of outcomes of social isolation addresses health-related behaviors or activities performed to promote health and manage chronic illness (Figure 1). These behaviors are consistent with the theory of self-care of chronic illness. According to Riegel, Jaarsma, and Stromberg (2012) [46], people with chronic illnesses perform the following three types of self-care behaviors: self-care maintenance, which includes the healthy practices of regular physical activity, healthy diet, and treatment adherence; self-care monitoring, or the process of observing oneself for signs and symptoms of an illness, and self-care management, or the response to signs and symptoms, such as calling the provider or taking a pill to control a symptom. Self-care is essential in chronic illness to promote health outcomes [47]. However, it has also been found that such behaviors are rarely reported in this population, and one of the reasons for this is the degree of social interactions.

Persons affected by a chronic illness who live alone or have small social networks are more likely to have poor self-care. Evidence to directly support this proposition is lacking; however, we know that older people who are socially isolated are more likely to eat a poor diet and less likely to adhere to regular physical activity [48] than those who are not socially isolated. The reason may lie in the fact that one's social network both increases the likelihood of receiving support for healthcare, as well as peer pressure to engage in health-promoting practices [49].

Self-care is also negatively associated with subjective social isolation (i.e., loneliness); for example, lonely people have been found to exhibit eating disorders, be more likely to smoke [50], and inconsistent in taking prescribed medications compared to those who are not lonely [51]. We already know that loneliness inhibits socialization; however, the effect of loneliness on self-care behaviors may also be due to a compromised self-regulation of emotion, which diminishes the likelihood of specific lifestyle behaviors such as physical activity [52].

4.3. Clinical Responses

We propose that the psychosocial and behavioral effects of social isolation may be determinants of clinical responses, conceptualized in this theory as the third group of outcomes (Figure 1). Accumulating evidence has shown that objective social isolation (i.e., social disconnectedness) [53] and loneliness negatively affect cognitive function [54]. One theory that has been proposed to explain this association is the "use it or lose it" theory, which postulates that intellectual, physical, and social activities stimulate the brain; a lack of participation in social activities results in a decrease in the use of mental faculties, thus explaining the cognitive decline [55].

Cardiovascular diseases (e.g., hypertension, heart failure, and stroke) are also prevalent in lonely and isolated people. The possible mechanisms are related to neuroendocrine dysregulation and hyperactivity of the sympathetic nervous system, leading to hypertension and inflammatory responses [56,57].

Finally, it is well known that socially disconnected and lonely people make greater use of healthcare services [58]. The reason may be attributable both to their poorer health status and a lack of perceived social support, which increases the need for formal healthcare providers to help in the case of health needs (especially emergency department visits).

5. Patterns of Social Isolation in Chronic Illness

In this section, we describe four possible patterns of social isolation in the context of chronic illness (Figure 2). For the sake of simplicity, these configurations are presented by considering the two related dimensions of social disconnectedness and loneliness overall, thus leaving interested researchers to investigate each individual indicator of the construct.

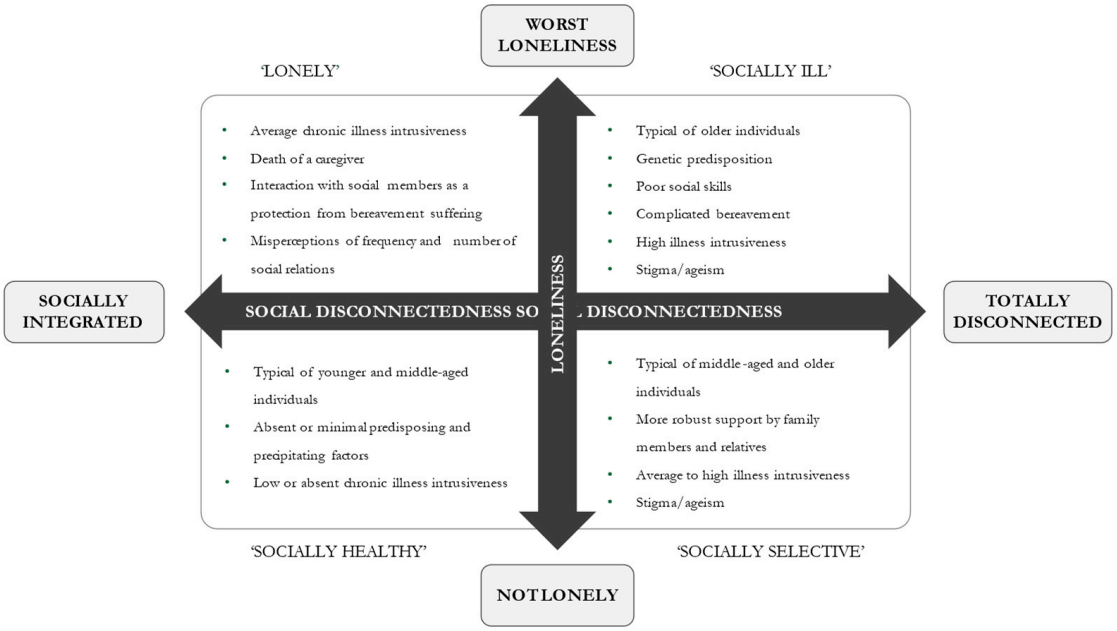

Figure 2. Hypothesized patterns of social isolation and their characteristics in chronic illness.

5.1. Low or Absent Social Disconnectedness and Loneliness

There are scenarios where both the precipitating and predisposing factors are absent or minimal. In this situation, people are more likely to be younger, have good social skills, live in a favorable environment with many opportunities for socialization outside the home, and be affected by a chronic illness with a low level of intrusiveness (e.g., asymptomatic) and not stigmatized. They are also more likely to be surrounded by people that provide emotional and instrumental social support and not suffer from sensory deficits. A typical example is a middle-aged individual affected by essential hypertension that is effectively controlled by a medication regimen and who has strong and active relationships with friends and family members.

5.2. Increased Social Disconnectedness and Low or Absent Loneliness

This situation occurs when one's social network is reduced in terms of the number of interactions and relationship types, but the person does not suffer from loneliness. Drawing on the socio-emotional selectivity theory of Carstensen, Isaacowitz, and Charles (1999) [59], we postulate that the presence of an intrusive chronic illness, in parallel with the process of aging, sparks a progressive selectivity process, in which individuals become increasingly aware of a limited time horizon. Consequently, they invest more in relationships that are emotionally rewarding and supportive (e.g., family members and relatives) and minimize contacts that will not pay off in the future (e.g., non-kin social partners) [60]. The mobilization of intimate helpers in the context of a chronic illness reinforces the feeling of being loved and respected and increases awareness that tangible aid is available in times of need. This form of intimate social support strengthens resilience and the ability to cope with possible stressors (e.g., stigma and ageism), thus reducing the likelihood of loneliness. However, those in this group remain vulnerable because fewer social network members may directly contribute to worse health outcomes through a direct effect (Figure 3).

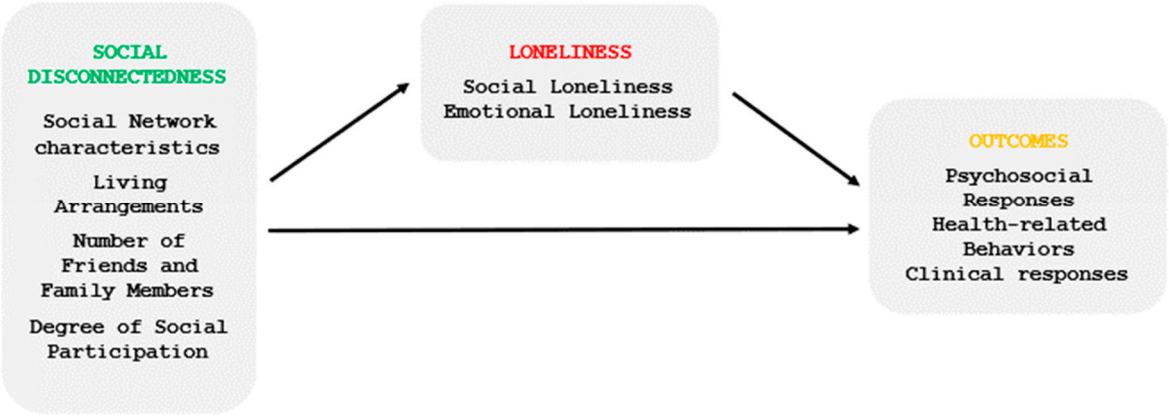

Figure 3. Pictorial representation of the direct and mediating effects of social disconnectedness on health outcomes.

5.3. Increased Social Disconnectedness and High Loneliness

This scenario is exemplified by the individual with a small social network who experiences loneliness. We draw from the evolutionary mechanism for loneliness [61] to describe how people with chronic illnesses are more likely to experience social disconnectedness and feelings of loneliness than healthy individuals. The presence of a chronic illness makes the person more aware of their greater need for emotional and instrumental support (especially when the illness is intrusive) and the increased threat to safety when social contacts are unavailable. This feeling of threat sparks feelings of loneliness, which represents an adverse but evolutionary adaptive reaction, similar to thirst and anger, to re-establish a safe social environment. We postulate that having few social contacts is more common in individuals with poor social skills (i.e., those who have conflictive and poor emotional bonds and those who struggle to maintain healthy relationships) [62]. We assume that the process can also be ignited in the case of a sudden adverse emotional event (e.g., the loss of a family caregiver or a spouse) or a highly stigmatizing illness. In this group, loneliness can have a direct effect on health outcomes or be a mediator of the effect of social disconnectedness on outcomes (Figure 3).

5.4. Low/Absent Social Disconnectedness and Increased Loneliness

Some people can be lonely without feeling socially isolated. This is the case of those with strong family and non-family bonds who experience a sudden event connected to the chronic illness, such as the death of an informal caregiver. The course of bereavement elapses without complications, and the person escapes the suffering of grief by interacting with their usual social members. Another case is when the chronically ill person perceives their self-rated health to be poor, which is likely to lead to social loneliness because they misperceive that they can no longer interact with social members in the desired way [63]. In this group, loneliness exposes the subjects to poor health outcomes through a direct effect (Figure 3).

6. Assumptions

Assumptions are statements accepted as truth without proof [64]. This theory includes the following four assumptions.

Human beings have an innate desire to interact with others. This premise is based on the concept that humans have an inherent social nature and rely heavily on social contacts to survive and prolong their existence [65].

(1) Chronic illnesses hinder human beings from engaging in social interactions. A vast body of research describes chronic illnesses as disrupting social events [6,66].
(2) Loneliness is a traumatic and detrimental form of social isolation, given the psychological pain and distressing state resulting from the experience [67].

(3) Loneliness is an experience that people do not seek voluntarily. This assumption is in contrast to objective isolation, which can be manipulated to regulate social adjustment, for example, using social network selectivity [60].

7. Propositions

Testable predictions or propositions are part of scientific theories. We propose the following eight testable propositions associated with this theory of social isolation in chronic illness:

(1) Higher levels of chronic illness intrusiveness impede social participation and reduce the size of social networks.
(2) Social isolation decreases self-care behaviors in people with chronic illnesses.
(3) Stigma related to the chronic illness undermines social interactions and predisposes people to loneliness.
(4) Social disconnectedness and loneliness in chronic illness patients significantly increase health service use.
(5) In chronic illness, the precipitating factors act as triggers to generate social isolation, especially when they occur in clusters.
(6) Social network selectivity in chronically ill people protects against loneliness.
(7) When an illness is not intrusive and predisposing, and the precipitating factors are absent or minimal, individuals are likely to be socially healthy.

8. Clinical and Research Implications

The primary objective of this paper was to present an inductive middle-range theory to describe how the complex phenomenon of social isolation develops during the chronic illness trajectory. We theorized possible predictors and outcomes of social isolation, which offer potential targets for tailored interventions to promote social interactions and minimize the impact of loneliness. Unfortunately, most of the interventional studies conducted to date have targeted older individuals in specific settings (e.g., primary care) or the general community, while relatively few interventions were conducted on the basis of precipitating factors conditioned by the chronic illness [16]. For example, Ellis et al., (2021) [68] reviewed papers that describe the impact of hearing interventions and concluded that the evidence to support their use to treat social isolation is inadequate and insufficient. Other possible interventions were described in order to reduce stigma associated with specific conditions and promote peer interaction, but these issues have received little research attention [69].

Overall, many implications arise from this work. First and foremost, this theory can guide clinical practice; nurses and other health professionals caring for chronically ill individuals should promote screening processes with valid and reliable instruments to understand the extent of isolation and the factors contributing to this phenomenon. Tailored preventative interventions should be designed for at-risk individuals to suppress or limit the impact of the precipitating factors and ultimately promote social integration.

From a research perspective, this theory can be empirically tested, due to the relational propositions formulated. In particular, we suggest that this framework is tested on specific chronic illnesses because living with a chronic illness is a highly subjective experience that involves a delicate adaptation and adjustment process [70], which can precipitate unique, different experiences of loneliness and social disconnectedness.

9. Conclusions

Social isolation and chronic illnesses represent two major public health problems whose management has become a primary driver of health and social policies, and nursing care worldwide. This middle-range theory facilitates the evaluation of the construct of social isolation, alongside its predisposing and precipitating factors. Nurses and other healthcare professionals can use this framework to screen for isolation and possibly tailor and test effective interventions to promote social engagement and prevent loneliness.

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The Stigma of Obesity: A Review and Update

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Obese individuals are highly stigmatized and face multiple forms of prejudice and discrimination because of their weight (1,2). The prevalence of weight discrimination in the United States has increased by 66% over the past decade (3), and is comparable to rates of racial discrimination, especially among women (4). Weight bias translates into inequities in employment settings, health-care facilities, and educational institutions, often due to widespread negative stereotypes that overweight and obese persons are lazy, unmotivated, lacking in self-discipline, less competent, noncompliant, and sloppy (2,5–7). These stereotypes are prevalent and are rarely challenged in Western society, leaving overweight and obese persons vulnerable to social injustice, unfair treatment, and impaired quality of life as a result of substantial disadvantages and stigma.

In 2001, Puhl and Brownell published the first comprehensive review of several decades of research documenting bias and stigma toward overweight and obese persons (2). This review summarized weight stigma in domains of employment, health care, and education, demonstrating the vulnerability of obese persons to many forms of unfair treatment. Despite evidence of weight bias in important areas of living, the authors noted many gaps in research regarding the nature and extent of weight stigma in various settings, the lack of science on emotional and physical health consequences of weight bias, and the paucity of interventions to reduce negative stigma.

In recent years, attention to weight bias has increased, with a growing recognition of the pervasiveness of weight bias and stigma, and its potential harmful consequences for obese persons. The aim of this article is to provide an update of scientific evidence on weight bias toward overweight and obese adults through a systematic review of published literature since the 2001 article by Puhl and Brownell. This review expands upon previous findings of weight bias in major domains of living, documents new areas where weight bias has been studied, and highlights ongoing research questions that need to be addressed to advance this field of study.

A systematic literature search of studies published between January 2000 and May 2008 was undertaken on computerized psychological, medical, social science, sport, and education databases including PsycINFO, PubMed, SCOPUS, ERIC, and *SPORTDiscus*. The following keyword combinations were used: weight, obese, obesity, overweight, BMI, fat, fatness, size, heavy, large, appearance, big, heavyweight, bias, biased, discrimination, discriminatory, discriminate, stigma, stigmatized, stigmatization, prejudice, prejudicial, stereotype(s), stereotypical, stereotyping, victimization, victimize(d), blame(d), blaming, shame(d), shaming, teasing, tease(d), unfair, bully, bullying, harassment, assumptions, attributions, education, health, health care, sales, employment, wages, promotion, adoption, jury, customer service, housing, media, television. Reference lists of retrieved articles and books were also reviewed, and manual searches were conducted in the databases and journals for authors who had published in this field. Most studies retrieved for this review were published in the United States. Any articles published internationally are noted with their country of origin.

Research on weight stigma in adolescents and children was excluded from this review, as this literature was recently reviewed elsewhere (8). Unpublished manuscripts and dissertations were also excluded. In addition, issues pertaining to measurement of weight stigmatization, and demographic variables affecting vulnerability to weight bias such as gender, age, race, and body weight are not addressed in this review. This article instead primarily reviews the evidence of specific areas where weight bias occurs toward adults and its consequences for those affected.

This article is organized similarly to the first review published by Puhl and Brownell (2), with sections on weight bias in settings of employment, health care, and education. New sections have been added including weight bias in interpersonal relationships and the media, as well as psychological and physical health consequences of weight bias, and the status of stigma-reduction research. As with the 2001 article, this review also provides an update on legal initiatives to combat weight discrimination, and outlines specific questions for future research.

EMPLOYMENT SETTINGS

In their 2001 review, Puhl and Brownell summarized research documenting weight-based prejudice and discrimination in employment settings (2). At that time, emerging evidence demonstrated that overweight and obese workers face stereotypical attitudes from employers

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and disadvantages in hiring, wages, promotions, and job termination because of their weight. Since then, there has been an increase in survey research, large population-based studies, and experimental work addressing weight discrimination in employment. Findings are summarized below.

Self-report studies indicate that perceptions of weight-based employment discrimination remain common among obese persons. In one survey study of overweight and obese women (N = 2,249), 25% of participants reported experiencing job discrimination because of their weight. In addition, 54% reported weight stigma from co-workers or colleagues and 43% reported experiencing weight stigma from their employers or supervisors (9). Examples of weight stigma in employment settings included being the target of derogatory humor and pejorative comments from co-workers and supervisors, and differential treatment because of weight such as not being hired, being denied promotions, or fired because of one's weight.

Several recent studies have examined weight discrimination in employment settings using data from the National Survey of Midlife Development in the United States, a nationally representative sample of adults ages 25–74 years. One study (N = 2,838) found that overweight respondents were 12 times more likely, obese respondents were 37 times more likely, and severely obese respondents were 100 times more likely than normal-weight respondents to report employment discrimination. In addition, women were 16 times more likely to report weight-related employment discrimination than men (10). Another study using the data of National Survey of Midlife Development in the United States (N = 2,290) found that among individuals who reported weight discrimination in employment almost 60% had experienced this mistreatment an average of four times during their lifetime. The specific types of employment discrimination reported included not being hired for a job, not receiving a promotion, and wrongful termination (4). Instances of wrongful termination that have been filed in legal cases typically involve an obese employee who was fired because of his/her weight despite positive performance evaluations and/or despite weight being unrelated to job duties. To date, most studies reflect perceptions by employees that weight was the deciding factor for job termination. A third study analyzing data of National Survey of Midlife Development in the United States (N = 3,437) found that 26% of obese persons and 31% of very obese persons reported discrimination in the workplace, which they attributed to their weight and appearance. Furthermore, very obese persons working in professional jobs were more likely than obese nonprofessionals to report employment discrimination (11).

Several studies analyzing data from the National Longitudinal Survey of Youth suggest that obesity also negatively affects wages. In one study (N = 12,686), a consistent wage penalty for obese employees was demonstrated, even after controlling for socioeconomic and familial variables, and health limitations. For obese men, the wage penalty ranged from 0.7 to 3.4%. For obese women, the wage penalty was greater and ranged from 2.3 to 6.1% (12). The authors suggested that discrimination in training opportunities may explain some of the obesity wage penalty, although it should be noted that they did not test for employer-based discrimination. Another study using National Longitudinal Survey of Youth data (N = 25,843) found that for white females, an increase of 64 pounds above average weight was associated with a 9% decrease in wages, which was approximately equivalent to the difference of 1.5 years of education or 3 years of work experience (13). A third study analyzed data from the 1988 wave of the National Longitudinal Survey of Youth when respondents were 23–30 years old (N = 6,601). This analysis revealed that both black and white obese women experienced significant wage penalties, even after controlling for socioeconomic status and other related variables. Compared to their normal-weight counterparts, mildly obese and severely obese white women experienced a decrease in wages of 5.8% and 24%, respectively. Similarly, mildly obese and severely obese black women's wages were 3.3% and 14.6% less than normal-weight black women's wages, respectively. Severely obese white men earned 19.6% less and severely obese black men earned 3.5% less than their normal-weight counterparts (14).

Other cross-sectional research supports these findings. In a study examining adults living in countries belonging to the European Union (N = 17,767 women and 34,679 men), it was observed that a 10% increase in the average BMI reduced the hourly wages of males by 1.9% and females by 3.3%. In Southern European countries, where citizens are reportedly more concerned with weight gain, the effect was much larger (15). Other work analyzing data from the 1984 National Lawyer Survey (N = 722) found that overweight male lawyers were paid less than normal-weight male lawyers (16).

Weight bias may also help explain studies documenting lower rates of employment for obese individuals. For example, Klarenbach and colleagues analyzed data from the Canadian Community Health Survey, a population-based household survey of over 73,500 individuals. The study found obesity to be associated with lower workforce participation, independent of associated comorbidities and sociodemographic factors (17). In addition, a study using data from a nationwide prospective cohort in the United States (N = 4,290) estimated the effect of obesity on future employment. After adjusting for sociodemographic characteristics, smoking status, exercise, and self-reported health, obesity was associated with reduced employment for both men and women (18). Other population-based studies from outside the United States support these findings (19–22).

Experimental research provides key evidence of causal links between weight-based discrimination and hiring decisions. Typically, experimental studies ask participants to evaluate a fictional applicant's qualifications for a job, where his or her weight has been manipulated (through written vignettes, videos, photographs or computer morphing). Roehling and colleagues recently conducted a meta-analysis of 32 experimental studies investigating

weight discrimination in employment settings (23). Studies were included in the analysis if they involved simulated employment decisions and demonstrated an effect size between target weight and job-related outcome variables. Outcome variables included hiring recommendations, qualification/suitability ratings, disciplinary decisions, salary assignments, placement decisions, and coworker ratings. Across studies, it was demonstrated that overweight job applicants and employees were evaluated more negatively and had more negative employment outcomes compared to nonoverweight applicants and employees.

The authors additionally assessed a number of moderators that may influence the relationship between weight and discriminatory attitudes. Potential moderators included both target and rater characteristics such as gender and race, and the type of job for which targets were evaluated. Although rater characteristics did not significantly influence the relationship between weight and employment ratings, several traits of the target emerged as important moderators. First, findings showed that both overweight men and women were equally susceptible to weight discrimination in the workplace, which challenges some previous research documenting gender differences in weight bias (4,24). The authors suggest that their finding should be interpreted with caution, as some research suggests that weight-based employment discrimination may occur at lower weight levels for women than for men (4,14,22), and the majority of the studies included in the meta-analysis contrasted a nonoverweight target with an obese target. If studies manipulated a wider range of weight levels and different forms of weight discrimination, greater differences may have been observed between men and women.

The meta-analysis also showed that overweight employees were more disadvantaged than nonoverweight applicants when they were being evaluated for jobs that required extensive public contact, and when they were rated for their desirability as a coworker. In addition, white targets were more heavily penalized in employment decisions than overweight African Americans. However, these findings should also be interpreted cautiously because only two studies investigated the effect of race. Given that African Americans can be targets of racial bias, it may be difficult to disentangle the effects of weight bias among other layers of prejudice.

Finally, several methodological variables influenced results across studies. When participants were provided with a relatively large amount of job-relevant information prior to making their evaluations, the relationship between the target's weight and employment outcomes were weaker compared to studies where little job-relevant information was provided. The effects of weight discrimination were also stronger in studies that pilot-tested the weight manipulation information and in studies that presented the target's weight through written or verbal descriptions vs. videos or photographs (23).

These experimental findings clearly demonstrate that overweight and obese individuals are disadvantaged in workplace interactions, evaluations, and employment outcomes as a result of negative weight-based stereotypes. Research to date suggests that the most common stereotypes about obese employees include views that they are less conscientious, less agreeable, less emotionally stable, and less extraverted that their normal-weight counterparts (25–28). To investigate the validity of common stereotypes about overweight job applicants and employees, Roehling and colleagues conducted two studies to examine the relationship between body weight and four relevant personality traits (conscientiousness, agreeableness, emotional stability, and extraversion) (29). In the first study using a nationally representative sample of 3,176 adults, BMI was compared with personality trait measures from the Midlife Development Inventory Personality Scales. Findings showed that the relationship between personality and demographic variables (age or gender) was stronger than the relationship between BMI and personality traits. The second study compared body weight and personality traits from the NEO Personality Inventory (Short Form) in 320 college students. No evidence was found for differences in personality characteristics based on weight. These findings help challenge commonly held stereotypes about negative personality traits of overweight employees.

Summary and methodological limitations

Recent survey and population-based studies show that high percentages of obese workers perceive consistent weight-based disparities in employment settings. Their perceptions are supported by large-scale studies documenting lower wages for obese employees, and experimental research demonstrating that overweight job applicants experience discrimination in hiring and employment decisions. Future work should examine a wider range of weight levels, job types, gender and race interactions with weight, and both subtle and overt forms of bias to help provide a clearer understanding of weight discrimination in the workplace. It will also be useful to assess potential mediators and contextual factors (e.g., employer concerns about rising health-care costs) that may influence employment outcomes for obese individuals.

HEALTH-CARE SETTINGS

Overweight and obese patients are vulnerable to multiple forms of weight bias in health-care settings. In 2001, Puhl and Brownell summarized a number of studies demonstrating that health-care professionals (e.g., physicians, nurses, psychologists, and medical students) possess negative attitudes toward obese patients, including beliefs that obese patients are lazy, noncompliant, undisciplined, and have low willpower (2). Research since 2001 expands upon this body of knowledge, providing new insight into providers' attitudes and weight management practices, and health-care experiences of obese patients.

HEALTH PROFESSIONALS' ATTITUDES TOWARD OBESE PATIENTS

In recent years, increasing research in the United States and abroad demonstrate

that health-care providers in a range of specialty areas endorse stereotypical assumptions about obese patients and attribute obesity to blameworthy causes.

Physicians. In a study of over 620 primary care physicians, >50% viewed obese patients as awkward, unattractive, ugly, and noncompliant. One-third of the sample further characterized obese patients as weak-willed, sloppy, and lazy. Physicians also viewed obesity as largely a behavioral problem caused by physical inactivity and overeating (30). A study of British healthcare professionals (N = 255) found that providers perceived overweight people to have reduced self-esteem, sexual attractiveness, and health. Providers believed that physical inactivity, overeating, food addiction, and personality characteristics were the most important causes of overweight (31).

In a study of 600 general practitioners (GPs) in France, 30% considered overweight and obese patients to be lazier and more self-indulgent than normal-weight people, and 60% identified lack of patient motivation as the most common problem in treating overweight and obese patients. GPs also considered "eating too much' as the most important risk factor for obesity, ranked above genetic and environmental factors. Providers who endorsed negative attitudes toward obese patients were less likely to subscribe to medical journals, suggesting that GPs may not have been familiar with current research examining the complex causes of obesity (32). Another French study found that 73% of GPs (N = 607) agreed that health professionals hold negative attitudes toward their obese patients. GPs ranked patient noncompliance and lack of motivation as the most important problems they experienced in treating obesity (33).

A study of 752 Australian GPs found similar results, where providers reported that their most common frustrations in weight management were patients' lack of compliance and motivation (34). Likewise, an Israeli study showed that 31% of family physicians (N = 510) agreed that overweight people tend to be lazier than normal-weight people and 25% agreed that overweight people lack willpower and motivation compared to normal-weight people (35).

In a British qualitative study, primary care physicians (N = 21) reported beliefs that obesity was caused by an unhealthy diet and lack of exercise and that it was the responsibility of the patients themselves to manage their weight. Physicians expressed frustration that patients made excuses as to why they could not comply with lifestyle recommendations. Despite these frustrations, physicians expressed an interest in maintaining positive provider–patient relationships (36). In contrast, a study examining attitudes of military family physicians (N = 214) found that providers reported generally positive attitudes toward obese patients. However, 25% indicated that their obese patients were lacking in self-control (37).

Experimental work supports findings of self-report studies. Hebl and Xu examined how a patient's body weight influences attitudes among primary care physicians (N = 122), who viewed one of six vignettes depicting patients who were identical except for sex (male/female) and BMI (23, 30, or 36 kg/m^2). The results revealed a strong, consistent linear trend in the way that physicians responded to the size of patients. As the patient became heavier, physicians judged them to be less healthy, worse at taking care of themselves, and less self-disciplined. In addition, as patient BMI increased, physicians reported liking their jobs less, having less patience, and less desire to help the patient. Physicians also reported that seeing obese patients was a greater waste of their time and that heavier patients were more annoying than patients with lower body weights. Furthermore, physicians predicted that heavier patients would be less likely to comply with medical advice and would be less likely to benefit from counseling (38).

Since 2000, two studies have employed the Implicit Association Test to assess implicit antifat bias among health professionals who specialize in treating obesity. Both studies found there to be a strong implicit antifat bias among clinicians and researchers specializing in obesity. Teachman and Brownell found that health professionals (N = 84) associated "fat people" with negative attributes such as "bad" and "lazy" and "thin people" with positive attributes, such as "good" and "motivated". Participants also endorsed the explicit belief that thin people are more motivated than fat people (39). Schwartz and colleagues found that health professionals (N = 389) endorsed both the implicit and explicit stereotypes that fat people are lazy, stupid, and worthless (40).

Despite common beliefs that obese patients lack motivation to make lifestyle changes and are noncompliant with treatment recommendations (32,34,35,41) there is evidence to suggest that physicians' perceptions of patient motivation may be misguided. Befort and colleagues found that, patients' self-reported level of motivation regarding weight management was significantly higher than physicians' perceptions. A motivation level of "10 = completely motivated" was reported by 30% of female and 21% of male patients, whereas physicians rated only 2.5% and 3.1% of their female and male patients, respectively, as being a "10". Similarly, some research suggests that physicians and patients have different perceptions about the causes of obesity, which may influence endorsement of weight stigma. In one United Kingdom study, GPs (n = 89) reported a victim-blaming approach toward obesity, deeming the individual responsible for both the cause (e.g., eating too much) and the solution to their weight problem. However, patients (n = 599) in the study were more likely to attribute obesity to medical causes or low income (42). Differences in perceived motivation or causes of obesity between doctor and patient may hinder positive communication regarding weight management or healthy lifestyle changes (43).

Nurses. Recent research has also demonstrated negative attitudes toward obese patients among nurses. A 2006 review of research focusing on nurses' attitudes toward adult overweight and obese patients reported that nurses consistently express biased attitudes toward obese patients, reflecting common weight-based stereotypes that obese patients are lazy, lacking in self-control, and noncompliant

(41). In a British study of 398 nurses, nearly 69% agreed that personal choices about food and physical activity explain why a person becomes obese, one-third agreed that obesity is due to a lack of willpower concerning food, and only 8.2% agreed that obese people are motivated about lifestyle change (44). Nurses with lower BMIs expressed more negative perceptions of obesity.

Brown and Thompson conducted qualitative interviews of 15 primary care nurses in England concerning their attitudes and beliefs toward obesity management. Although nurses were aware that obesity is a stigmatized condition and were careful to avoid weight-based stereotypes, some expressed frustration with patients' noncompliance and wanting an "easy way out". Nurses with high BMIs felt self-conscious about their size and reported that patients made rude comments about their weight (45). Contrary to other studies assessing nurses' attitudes toward obese patients, a 2006 study found that registered nurses (N = 119) had positive attitudes toward adult obese patients and that nurses were concerned with providing respectful patient care. However, these findings should be interpreted with caution due to the study's low response rate (16.2%), which may indicate that only nurses who are sensitive to the needs of the obese patients chose to complete and return the survey (46).

Medical students. Medical students express many of the same negative attitudes toward obese patients as more seasoned health professionals. Wear and colleagues examined attitudes of medical students (N = 54) toward a variety of patients, and found that the students reported, with nearly total agreement, that severely obese patients were the most common target of derogatory humor by attending physicians, residents, and students, which occurred most often in surgery and obstetrics–gynecology settings (47). Students indicated that their denigration of obese patients was due to both the assumption that patients were to blame for their condition and because patients' obesity caused extra work for students. Students reported that overweight and obese children were also targets of humor. Most of the students did not consider derogatory humor directed toward obese patients to be inappropriate. In another study, medical students (N = 48) were randomly assigned to view videotapes of actors pretending to be either average weight patients or obese patients (by using padding and bulky clothing) visiting their physician for the first time. Students who viewed tapes of the obese-appearing patients predicted that the patients would be less likely to make lifestyle changes, would not be as responsive to counseling, and would be less likely to comply with treatment recommendations, compared to students who viewed average weight patients. Patients who appeared obese were also rated by students as less attractive, less compliant, and more depressed than average weight patients (48). Similarly, dental students have reported negative attitudes toward obese patients. One study (N = 420) found that nearly one-third of dental students acknowledged having negative reactions toward the appearance of obese patients, 30% felt that obese people are lazier than nonobese people, 26% felt that obese people lacked willpower and motivation, 18% were uncomfortable examining an obese patients, and 17% considered it difficult to feel empathy for an obese patient (49).

Fitness professionals and dietitians. Fitness professionals and exercise science students also express weight bias. In a study of fitness professionals (N = 325), 62% agreed that obesity is a significant cause of personal rejection, and most participants believed that personal factors such as sedentary lifestyle, poor eating behaviors, and psychological problems were the most important causes of obesity (50). Using the Implicit Association Test, other research has documented a strong implicit antifat bias among exercise science students (N = 246). Being female, white, and having a lower BMI were all associated with stronger implicit antifat bias. Students also endorsed explicit attitudes that fat people are lazy, physically unattractive, buy too much junk food, and could lose weight if they really wanted to do so (51).

Recent work suggests that dietitians are not immune to weight bias. Berryman and colleagues assessed negative attitudes toward obesity among dietetics and nondietetics students (52). Both groups (N = 76) exhibited moderate levels of fat phobia as a whole and 16% of both groups exhibited high levels of fat phobia. The majority of students (ranging from 71 to 91%) agreed or strongly agreed with the stereotypes that overweight people overeat, are inactive, slow, insecure, shapeless, and have no endurance, low self-esteem, and poor self-control. Over half of students agreed or strongly agreed that overweight people are unattractive, have no willpower, and are lazy. The authors conclude that dietetics curriculum does not adequately dispel weight bias. A study of 187 British dietitians found that although attitudes were mixed, dietitians rated obese people less positively than overweight people and indicated that obese people were more responsible for their excess weight than overweight people (53). Another study found that Australian dietitians (N = 400) reported frustration with their overweight and obese clients' lack of commitment and motivation, poor compliance, and unrealistic expectations (54).

Most recently, Puhl and colleagues used an experimental design to assess weight bias among dietetics students (55). One hundred and eighty-two dietetic students were randomly assigned to read one of four patient health profiles that varied only by weight and gender. Compared to students who read nonobese patient profiles, students who read obese profiles rated the patients as less likely to comply with treatment recommendations and as having worse diet quality and health status, despite the fact that dietary and lifestyle information were identical across conditions. In contrast, obese and nonobese patients were rated to be similarly motivated. In addition, participants in all conditions expressed a moderate amount of fat phobia, similar to findings of Berryman *et al.* The majority of the dietetic students (ranging from 54 to 81%) agreed that obese individuals have poor self-control, lack endurance, and

suffer from low self-esteem. Students also believed that obese individuals tend to overeat, are unattractive, slow, insecure, and inactive.

Providers' weight management practices

In addition to negative provider attitudes toward obese patients, it is also important to examine whether physicians' weight management treatment practices may compromise care for obese patients. For example, recent research shows that primary care physicians (N = 620) felt ill-equipped to treat obesity and believe that treatment is futile. Less than half felt competent in prescribing weight loss programs and only 14% believed themselves to be successful in helping obese patients lose weight (30). Another study of 600 GPs in France found that 57% felt they were ineffective in managing patients' weight. Despite feeling unprepared to treat obesity, 60% of the GPs set stricter weight loss standards for their patients than recommended guidelines (32). Similarly, another study of French GPs (N = 607), reported that only 42% felt they were sufficiently prepared to treat heavy patients (33).

Befort and colleagues found that physicians (N = 29) reported that they discuss weight at approximately half of their appointments but would prefer to discuss weight at only one-quarter of their appointments (43). Another study of 510 family physicians found that 72% believed that they had limited efficacy in treating obesity and considered themselves poorly prepared by their medical training to treat overweight patients. In addition, 60% reported insufficient knowledge regarding nutritional issues (35). In an Australian study, GPs (N = 752) felt they were sufficiently prepared to treat patients who were overweight, but approximately half had low expectations for the effectiveness of weight management (34).

Other health professionals also report feeling professionally unprepared to treat obesity. A study of nurses (N = 398) found that only 21.6% agreed that they are effective in helping obese clients lose weight (44). Among a sample of 400 dietitians, less than half felt prepared to treat clients who are obese and only one-third believed that dietitians are effective in the management of obesity (54). Block and colleagues found that internal medicine residents (N = 87) had a poor grasp of the tools necessary to identify and evaluate obesity. Fifty-six percent of residents did not feel qualified to treat obese patients and one-third believed that treating obesity was futile. Furthermore, residents who felt unqualified to treat obese patients were more likely to agree that behavioral factors were the primary cause of obesity (56).

Although one study has reported that fitness professionals generally consider counseling obese patients for weight loss to be professionally gratifying (50), most studies demonstrate that health professionals feel that treating obesity is professionally unrewarding (32–34,37,54). If providers are professionally unsatisfied treating obese patients, they may be deterred from putting forth sufficient effort to help their obese patients. For example, recent experimental research suggests that physicians may spend less time with overweight patients than nonoverweight patients. Hebl and Xu demonstrated that physicians who viewed profiles of heavier patients indicated that they would spend less time with those patients than physicians who viewed profiles of thin patients. In addition, only 42% of physicians chose to discuss weight loss with obese patients (38).

These findings parallel other work showing that overweight male patients perceive their physicians spend significantly less time with them than the duration of time reported by nonoverweight male patients (57). Bertakis and Azari, using a prospective design, investigated the impact of obesity on primary care by analyzing videotapes of 506 first-time patient visits with 105 physicians (58). Physicians spent less time providing health education to obese patients, while spending more time providing health education to patients who had better physical health and higher economic status. Additionally, patients' obesity was unrelated to provider discussions regarding nutrition. Another study found that >50% of physicians indicated that they would spend more time with obese patients if they were appropriately reimbursed (30). Taken together, these findings suggest that providers may be spending inadequate time with obese patients, despite the importance of providing them with information and resources to engage in healthy lifestyles.

Patients' views of biased treatment in health care

Providers' negative attitudes and questionable weight management practices do not go unnoticed by overweight and obese patients. Puhl and Brownell examined experiences of weight stigma among overweight and obese women (n = 2,449), and found that 53% reported receiving inappropriate comments from doctors about their weight. Furthermore, doctors were reported as the second most common source of stigma, among a list of over 20 possible sources. Sixty-nine percent of women reported experiencing stigma from a doctor once, and 52% on multiple occasions. Participants also reported experiencing stigma from other health professionals, including nurses (46%), dietitians (37%), and mental health professionals (21%). A smaller subsample matched for age and gender (n = 222) yielded similar results concerning stigmatizing experiences by health professionals (9).

In a study of 105 bariatric surgery candidates and 214 applicants to a pharmaceutical weight loss trial, 43% of surgery candidates and 21.6% of nonsurgery patients reported that they had been treated disrespectfully by medical professionals because of their weight. In addition, 43.4% of surgery candidates and 22.5% of nonsurgery candidates reported being very upset by comments that doctors have made about their weight. More than 70% of patients in both groups reported that they felt like most doctors do not understand how difficult it is to be overweight (59). Another study of 161 obese adults attending dietetic outpatient clinics in the United Kingdom found that the majority of respondents (84%) agreed that "weight is blamed for most medical problems'. Those with a higher BMI were more likely to agree with the statements "chairs are never big enough" and

"I am regarded as a second class citizen". Women were also more likely to agree with the statement "nobody looks into why I am overweight – they just put me on diets" (60).

Brown and colleagues conducted semistructured interviews with 28 British obese patients about their experiences in primary care. Participants reported reluctance to address weight concerns with their health-care providers and perceived that they would not be taken seriously. Participants also discussed concerns about the stigmatized nature of obesity and expected to face negative stereotypes in primary care, however, mentioned the possibility of nurse-led support groups as an avenue for improving health-care services (61). Another study of 2,340 patients who completed self-report surveys showed that obese patients reported low levels of satisfaction with most aspects of medical care at their most recent visit compared to normal-weight patients. However, the association was attenuated after adjusting for health status. The authors suggest that the strong association between self-reported health status and patient satisfaction in the study may have masked a relationship between obesity and lower satisfaction (62).

Some studies suggest that obese patients report ambivalent or somewhat positive attitudes about their health-care experiences (57,63,64). One study of 9,914 adult patients who completed the 2000 Medical Expenditure Panel Survey and had visited a health-care professional in the past 12 months found there to be a very weak unadjusted association with BMI and patient satisfaction. However, after adjusting for demographic and health-care related variables, a small association was observed between BMI and patient satisfaction for those ≥55 years of age (65). More work is needed to clarify perceptions of care by obese patients, and to determine whether weight bias contributes to this relationship.

Impact of weight bias on health-care utilization

Obese patients who experience stigma in health-care settings may delay or forgo essential preventive care. Several studies show that obese persons are less likely to undergo age-appropriate screenings for breast, cervical, and colorectal cancer (66–74). Furthermore, research shows that lower rates of preventive care exist independently of factors that are typically associated with reduced health-care use, such as less education, lower income, lack of health insurance, and greater illness burden (71,73). Studies that have attempted to assess the reasons why obese women delay or forgo these preventive services have found that women report weight-related barriers, and in some cases, weight bias. Amy and colleagues surveyed 498 overweight and obese women about their perceived barriers to routine gynecological cancer screenings. For women with a BMI >55 kg/m^2, 68% reported that they delayed seeking health care because of their weight, and 83% reported that their weight was a barrier to getting appropriate health care. When asked about specific reasons for delay of care, women reported disrespectful treatment and negative attitudes from providers, embarrassment about being weighed, receiving unsolicited advice to lose weight, and gowns, exam tables, and other equipment being too small to be functional. The percentage of women reporting these concerns increased as BMI increased (75).

Another study of 216 women also found that BMI is associated with an increase in the delay and avoidance of preventive care. Women gave reasons for avoiding health care, such as having gained weight since their last visit, not wanting to be weighed on the providers' scale, undressing in the exam room, and knowing they would be told to lose weight (76). Wee and colleagues also found that, severely obese white women (N = 6,419) were significantly less likely to undergo cervical cancer screening compared with normal-weight women, even after controlling for sociodemographic variables, health-care access, and illness burden. These women reported embarrassment or discomfort as the primary reason for not undergoing screening (71). These findings are concerning, especially given the incidence of cancer and mortality rates in obese individuals (77). Removing the stigma-related barriers to receiving cancer screenings may help to diminish the relationship between excess body weight and cancer mortality. Alternatively, a small number of studies conducted outside of the United States find no association between BMI and use of preventive services (78,79). More research is needed to determine why these differences exist between countries.

Summary and methodological limitations

Building upon the evidence reviewed by Puhl and Brownell (2), recent studies confirm that obese patients encounter prejudice, ambivalence, and oftentimes unsatisfactory treatment in health care. Because much of the research continues to rely on self-report measures, there remains a need to examine actual health-care practices among providers, and records of patient data concerning their treatment outcomes and health-care utilization. Despite these gaps in research, it is clear that efforts to systematically improve the health-care experience for overweight and obese individuals are warranted. Specifically, research is needed to determine the most effective ways to educate providers' about weight bias in health care, dispel damaging obesity stereotypes, and to promote strategies to improve patient care. Some intervention strategies may be as straightforward as being mindful of language used when discussing weight with patients. For example, one study investigated the terms that obese patients prefer for describing their excess body weight and found that patients disliked certain descriptors, such as "obesity" and "fatness," but felt more comfortable when providers simply referred to their "weight" (80). More research is needed to determine the most effective ways for providers to communicate with their patients about weight. The limited efficacy of conventional weight loss treatment options may lead to frustration among providers in their legitimate, yet unsuccessful, attempts to help patients achieve significant, sustainable weight loss. Provider frustrations can

Table 1 Summary of key findings and evidence to date

Summary of key findings in existing weight bias research	Strength of evidence		
	Limited[a]	Moderate[b]	Strong[c]
Employment settings			
Obese employees perceive weight-based disparities in employment			x
Obese employees experience a wage penalty (controlling for sociodemographic variables)			x
Obese applicants face weight bias in job evaluations and hiring decisions			x
Obese employees face disadvantaged employment outcomes due to weight bias		x	
Health-care settings			
Health-care professionals endorse stereotypes and negative attitudes about obese patients			x
Weight bias negatively affects providers' weight management practices	x		
Obese patients perceive biased treatment in health care		x	
Weight bias negatively impacts health-care utilization	x		
Educational settings			
Weight bias contributes to educational disparities for obese students	x		
Educators endorse negative weight-based stereotypes and antifat attitudes	x		
Obese students perceive weight bias from educators	x		
Interpersonal relationships			
Weight bias negatively impacts romantic relationships for obese adults	x		
Obese individuals perceive weight bias from family members and friends		x	
Family/friends report stereotypes and negative attitudes about obese persons	x		
Media			
Overweight/obese characters are stigmatized in television and film			x
Overweight/obese characters are stereotyped in children's media (TV, videos, cartoons)		x	
Weight bias exists in news media		x	
Media and television exposure is positively related to stigmatization of obese persons	x		
Psychological and physical health consequences			
Weight bias increases vulnerabiliy to depression, low self-esteem, and poor body image		x	
Weight bias contributes to maladaptive eating behaviors among obese individuals			x
Weight bias contributes to less participation/avoidance of physical activity	x		
Weight bias negatively impacts cardiovascular health outcomes	x		
Stigma-reduction strategies			
Effective intervention strategies have been identified to reduce weight bias	x		

[a]Initial evidence has been documented, but clear conclusions cannot yet be established. [b]There is adequate evidence to suggest the phenomenon exists, but additional research is needed to strengthen current findings. [c]Consistent evidence across a number of studies. Findings are clearly established.

unintentionally translate into biased and negative interactions with patients. Thus, it may be useful to focus treatment goals on patients' behavioral and lifestyle changes (rather than emphasizing weight loss as the only measure of success), which may help temper provider frustrations and facilitate more collaborative and sensitive provider–patient interactions.

In addition, considering that providers' often report blameful explanations for the causes of obesity, one key educational component may be to increase providers' awareness about the complex etiology of obesity and the difficulties involved in obtaining significant and sustainable weight loss. However, it is important to note that the causal relationship between providers' negative attitudes and their treatment practices remains unclear. It is possible that lack of professional training and effective strategies for weight management lead providers to become frustrated and in turn form negative attitudes about obese patients. Establishing the link between provider attitudes, patient perceptions of stigma, and treatment outcomes is imperative. Additional research needs are outlined in **Table 1**.

Recognizing the problem of weight stigma in health-care settings, health professionals are increasingly articulating the need for increased sensitivity in the treatment of obese patients (81–84). These authors recommend that providers emphasize compassionate care with obese patients, regardless of whether patients lose weight. They suggest that providers avoid assumptions that a patient's obesity is to blame for all of

their health concerns and that they treat obese patients with the same respect and concern as any other patient suffering from a chronic disease (83,84). Healthcare providers have the unique opportunity to improve the welfare of obese patients. It is important that this opportunity is not lost due to weight bias.

EDUCATIONAL SETTINGS

As of 2001, research evidence was beginning to demonstrate that overweight and obese students face weight-based stigmatization from teachers, peers, and even parents in educational settings (2). This area has received less research attention than weight bias in health care or employment settings, but recent studies are providing further documentation of educational disparities between obese and nonobese groups.

A 2006 study of over 700,000 Swedish men found that those who were obese at age 18 had a lower chance of attaining higher education than their normalweight peers, even after adjustments for intelligence and parental socioeconomic position (85). In a study of 15,061 respondents to the 1996 Health Survey for England, obesity was associated with lower educational attainment in both men and women (86). Additionally, a 2007 study using data from the National Longitudinal Study of Adolescent Health $N = 10,829$) reported that obesity undermined the educational attainment of female students. Obese women were half as likely to attend college than nonobese women (87). However, in schools where female obesity was more prevalent, obese students had the same chance of attending college as nonobese students. Therefore, when female obesity was not the norm in the educational setting, obese women experienced greater educational disadvantages. These findings are supported by another study demonstrating that the relationship between obesity and lower academic achievement was stronger in schools with a lower average body size among students (88). In contrast, some studies have found no educational differences between obese and nonobese groups (19,89).

There are several possible explanations for links observed between obesity and lower educational attainment, one of which is weight bias. Research suggests that weight bias among educators may influence obese students' academic performance as early as elementary school (8). In their 2007 review, Puhl and Latner examine research demonstrating that teachers report stigmatizing attitudes toward obese students (8). If biased attitudes unintentionally result in differential treatment of obese students, their educational potential may be compromised. More recently, studies have demonstrated that physical educators also have negative perceptions of obese students. O'Brien and colleagues found strong implicit antifat attitudes among 180 students training to become physical educators in New Zealand compared to students in another field of study. Physical education (PE) students who had completed more years of study displayed higher levels of antifat attitudes than first-year PE students, suggesting PE curriculum may contribute the formation of biased attitudes. PE students also explicitly endorsed the belief that obese individuals lack willpower (90). Another study found that PE teachers ($n = 105$) expressed moderate antifat attitudes and reported lower expectations for obese students across a variety of performance areas. PE teachers also perceived overweight students to have poorer social, reasoning, physical, and cooperation skills compared to nonoverweight students (91).

Other research indicates that obese individuals report experiencing weight bias from educators. Puhl and Brownell found that 32% of overweight and obese women ($N = 2,449$) reported experiencing weight stigma from a teacher or a professor, and 21% had experienced it more than once or multiple times (9). Another study found that overweight middle school students reported occasionally receiving negative comments from teachers that led them to feel upset and avoid participating in PE class (92).

It is also possible that other social factors can help explain the relationship between obesity and educational attainment. One prospective study of 5,467 individuals in Scotland found that family and neighborhood factors explained much of the association between lower educational attainment and BMI, which was independent of childhood intelligence (93). In another longitudinal study of 1,044 individuals in Sweden, lower educational attainment for men was explained partly by low parental support for education during adolescence. For women, this relationship was partially explained by not being popular in school (94). Other studies also find that obese students have poor relationships with peers at school due to weight stigma (8), which may interfere with their success in educational settings.

Summary and methodological limitations

Research continues to suggest that heavy students face significant obstacles to educational achievement throughout their educational careers. However, this area of research remains understudied, and additional work is needed to assess the nature and prevalence of weight bias among educators and its impact on the educational achievement of overweight and obese students. It is also important to determine the relative contribution of weight bias compared to other social and economic factors that can potentially explain the relationship between obesity and educational success.

INTERPERSONAL RELATIONSHIPS

In addition to increased vulnerability to weight bias in employment, medical, and educational settings, obese individuals may also face stigma in close interpersonal relationships. This topic has received little research attention in the past, but recent studies have increasingly documented weight bias from romantic partners, family members, and friends, especially toward obese women.

Weight stigma may have an especially negative impact on dating prospects for obese women. A recent experimental study asked college students ($N = 238$) to rate a personal advertisement of a female target seeking a dating partner (95). Descriptions of the target's body weight were manipulated where she was described as being either "*fat*," "*overweight*," "*full-figured*," "*obese*," "*5′4″ and 197 lbs*," or a control condition with no

weight descriptor. Findings showed that large-size descriptors resulted in negative evaluations of the target by both women and men compared to the control condition. Specifically, negative weight descriptors (*obese*, *overweight*, and *fat*) primed more negative stereotypes about the target than did a more positive weight descriptor (*full-figured*) or an objective descriptor (*197 lbs*). These findings support previous research showing that fewer men responded to a personal advertisement in which a female target was identified as obese compared to an advertisement in which a woman disclosed having a history of drug problems (96).

Additional research suggests that obesity negatively affects dating relationships for women. Sheets and Ajmere surveyed 554 undergraduates, and found that overweight women were less likely to be dating than thinner peers, and that body weight was negatively correlated with relationship satisfaction. In addition, women who had been told to lose weight by their romantic partners reported lower relationship satisfaction. Overweight women appeared to be more disadvantaged as dating partners compared to men, whose weight played less of a role in dating relationships (97).

Few studies have examined the effect of obesity or weight stigma on sexual relationships. One study asked college students ($N = 449$) to rank order six pictures of hypothetical sexual partners, including an obese partner, a healthy partner, and partners with various disabilities (including a partner in a wheelchair, missing an arm, with a mental illness, or described as having a history of sexually transmitted diseases) (98). Both men and women ranked the obese person as the least desirable sexual partner compared to the others. However, men ranked the obese partner as significantly less preferable than women did, suggesting that weight stigma may be heightened for women in sexual relationships. These findings parallel other work demonstrating that obese women (but not men) are rated as being less sexually attractive, skilled, warm, and responsive, and less likely to experience sexual desire compared to normal-weight peers (99).

Obese individuals may also experience weight stigma from family members and friends. In a recent study, overweight and obese women ($N = 2,449$) were surveyed about the most common interpersonal sources of weight stigma in their lives (9). Participants were provided with a list of 22 different individuals and asked how often each individual had stigmatized them because of their weight. Family members were the most frequent source of weight stigma, reported by 72% of participants. When asked about experiences of weight stigmatization from specific family members, participants reported being stigmatized about their weight by mothers (53%), fathers (44%), sisters (37%), brothers (36%), sons (20%), and daughters (18%). Participants commonly reported being the target of weight-based teasing, name calling, and inappropriate, pejorative comments from parents and siblings (100). Friends were also common sources of weight bias (reported by 60% of participants) as were spouses (reported by 47% of participants) (9). Qualitative research similarly shows that obese individuals report stigmatizing experiences from their family members and peers (101). These findings may help to explain previous research demonstrating that obese women are more dissatisfied with family relationships and partner relationships than thinner women (102) and have fewer close friends than thinner women (103).

Other recent research has documented mixed findings. Using a nationally representative sample of American adults ($N = 3,656$), Carr and Friedman found no differences across BMI categories with respect to self-reported quality of relationships with friends, co-workers, and spouses (104). However, severely obese individuals reported higher levels of relationship strain and lower levels of support from family members compared to thinner peers. Interestingly, this finding only remained significant for persons who were also overweight in adolescence, where it was found that emotional support from family members declined as BMI increased over time. For people whose body weight was in the "normal" range by age 21, there was no association between BMI and relationship quality with family members.

Similarly, some research from Australia has reported a positive association between BMI and loneliness, even after controlling for age, gender, annual income, employment, and marital status (105), whereas another study reported no differences in degree of loneliness or romantic relationships between obese and nonobese persons in a Finnish sample (103). In addition, one study from Germany and another conducted in the Unites States have demonstrated that obese and nonobese persons fare similarly in self-reported social skills, social support, and subjective well-being (106), and size of social networks and socially based self-esteem (107). Thus, more work is needed to clarify whether, and to what extent, differences exist in interpersonal relationships, and how weight stigma contributes to these outcomes.

Summary and methodological limitations

Taken together, obese individuals (particularly women) appear to confront weight bias and negative stereotypes in a range of interpersonal relationships. However, given that several studies suggest that obese and nonobese persons fare similarly for quality of relationships, additional work in this area is needed to help clarify the differences that exist between obese and nonobese individuals, and how weight bias and gender influence these outcomes. Additional research is needed to determine the nature and extent of weight bias in social relationships, and to better understand how weight bias mediates the relationship between obesity and dissatisfaction in interpersonal relationships. It will also be important for research to address how these variables impact emotional well being of obese persons.

WEIGHT BIAS IN THE MEDIA

The media is a striking illustration of the social acceptability of weight stigma. Whether it be situation comedies, cartoons, movies, advertisements, or news reports, the media is unkind to overweight people. In the past year alone,

widely held news reports have held obese people partially responsible for rising fuel prices (108), global warming (109), and causing weight gain in their friends (110). Furthermore, overweight people remain one of the last acceptable targets of humor and ridicule in North American television and film.

Entertainment media

In adult and children's entertainment alike, thin characters are ascribed desirable attributes and dominate central roles. In contrast, overweight characters are rarely seen, unless in minor, stereotypical roles. Compared to thin characters on television, heavier characters are rarely portrayed in romantic relationships, are more likely to be the objects of humor and ridicule, and often engage in stereotypical eating behaviors (111,112). Fouts and Burggraf conducted a content analysis of 18 prime-time television sitcoms with 37 central female characters and found that the heavier the female character, the more negative comments she received from male characters. Moreover, negative comments directed toward heavy females were typically reinforced by audience laughter (113). This supports previous research demonstrating that underweight female characters receive significantly more positive verbal comments regarding their bodies than heavier characters (114). Interestingly, a content analysis of 75 central male characters on television found that the heavier the male character, the more negative self-references he made about his own weight. These comments were also typically followed by audience laughter (115).

Himes and Thompson recently examined 135 scenes from movies and television shows, finding that weight stigmatization and humor were often verbal and direct. Males and females were almost equally as likely to be targets of weight stigma; however, male characters were three times more likely to engage in fat stigmatization and humor than female characters. The authors note that the immense popularity of the movies and shows containing portrayals of weight stigmatization indicates its social acceptability (116).

Content analyses of children's media have also found that the prevailing tendency is to present positive messages about being thin and negative messages about being overweight. Klein and Shiffman examined 1,221 cartoons and over 4,000 cartoon characters that were produced between 1930 and the mid-1990s. Results showed that the proportion of overweight characters had declined in recent decades, while the prevalence of underweight characters had increased. In addition, socially desirable traits were associated with thinness and socially disapproved traits were associated with being overweight. Specifically, overweight characters were far more likely to be depicted as unattractive, unintelligent, and unhappy than their normal-weight or underweight counterparts. Overweight characters were also more often shown eating junk food and engaging in physical aggression, and half as likely to be classified as a "good guy" compared to thinner characters (117,118).

Similarly, a content analysis of 25 popular children's videos and 20 top children's books (for ages 4–8) found that thin female characters were depicted as having desirable traits such as sociability, kindness, happiness, and success. In contrast, overweight characters were commonly depicted as evil, unattractive, unfriendly, and cruel. Overweight characters were never shown in romantic relationships with thin characters, were often disliked by others, and often shown thinking about or eating food (119). Another recent content analysis of 19 children's television sitcoms and 162 characters from The Disney Channel, Nickelodeon, and Discovery Kids found that overweight characters were more likely to be portrayed as unattractive and having no friends compared to average weight and underweight characters (120).

A consistent finding in this area of research is that, compared to the general population, overweight characters are significantly underrepresented in the media, while underweight characters are overrepresented (112,115,117,120). This is especially true for female characters, who are more likely to be underweight than male characters (111,113,114). These inaccurate representations present a distorted and unrealistic view of adults' and children's bodies, and may reinforce weight bias. Research demonstrates that media consumption among children is associated with negative weight-related attitudes. One study surveyed 303 first- to third-grade children and found that young boys learned from the media to denigrate fatness and idealize thinness (121). Television viewing predicted and increased the tendency of males to stereotype an overweight female target by associating the target with negative characteristics, such as greediness. Boys were also more likely to associate thin girls with characteristics such as "nice," "smart," "clean," "tells the truth," and "has lots of friends". Similarly, Latner and colleagues examined attitudes in New Zealand adolescents ($N = 261$) and found that media exposure (including videogame playing, television viewing, and magazine use) was significantly associated with stigmatizing attitudes toward obese youth (122).

Advertising

Another source of weight bias stems from the ubiquitous advertising of weight loss products and programs. Many advertisements emphasize the message that weight is easily modifiable and that successful weight loss is a simple matter of personal effort. Belief in the controllability of weight often predicts stigmatizing attitudes (123,124). One study found that weight loss infomercials portrayed overweight women as unhappy and unattractive and perpetuated the message that weight loss is simple and straightforward. Infomercials also used "before and after" images to convey the message that weight loss is achievable and will make a person happier (125). Geier and colleagues examined the stigma-producing effects of "before and after" diet advertisements (126). Fifty-nine participants either viewed "before and after" images, only "before" images, or only "after" images. Participants who viewed the "before and after" pictures endorsed more negative attitudes toward obese persons than those who viewed only the "after" pictures. In addition, people who

viewed both the "before" and "after" pictures indicated that weight is more easily controllable than those who viewed only the "before" or only the "after" picture.

News media

The framing of obesity in the news media is integral to the public's understanding of obesity. Research shows that the news media often frames obesity in terms of personal responsibility (127–129), focusing on individual causes of obesity (e.g., eating an unhealthy diet) and individual-level solutions (e.g., changing one's diet). This focus on personal responsibility eclipses other important dimensions of the obesity epidemic and often unfairly blames obese individuals, potentially reinforcing weight bias.

News coverage of obesity has increased dramatically in recent years (130), and studies show that coverage of the personal causes and solutions to obesity significantly outnumber other societal attributions of responsibility (128). Through an analysis of 751 articles on obesity published in *The New York Times* between 1990 and 2001, Boero demonstrated that obesity was presented as a moral panic through which blame is placed on individuals. Furthermore, discussions of obesity were influenced by pre-existing cultural and moral understandings about fatness, which tend to focus on individual willpower (131).

Sandberg analyzed 1,925 articles from Swedish daily newspapers from 1997 to 2001 and found that obese people were often stigmatized. Overweight people were presented as "stupid," "ugly," "naïve," "irresponsible," "lazy", "greedy," "without manners," and "repugnant". Within discussions of health-care resources, overweight people were compared to parasites. Weight was also presented as a female problem and overweight women were described as "too big and sloppy," "sweating," and "disgusting" (132). Furthermore, news items that presented weight loss "success stories" also contributed to victim-blaming and the stigmatization of overweight individuals. People who lost weight described their "before" selves as weak and uncontrolled.

Although news reports discussing other dimensions of obesity (e.g., environmental, cultural, or biological explanations) are beginning to increase, personal responsibility arguments continue to be strongly expressed (129). It is interesting to note that references to personal solutions for obesity continue to outnumber references to personal causes (128). Thus, despite a broader understanding of the causes of obesity, solutions remain within the individual (131). Rich and Evans argue that unlike other public health issues (e.g., AIDS and cancer), the media seldom discusses the implications of its perspective on those affected by obesity, which may be damaging to individuals' health by invoking feelings of shame, guilt, and inadequacy. However, to the extent that the media serves to alienate those who are overweight, the consequences of weight prejudice are deemed to have no bearing on the issue of obesity (133).

Summary and methodological limitations

A recent article in *Newsweek* titled "*The Obese Should Have to Pay More For Airline Tickets*," referred to instituting weight surcharges for airplane tickets as an added "social disincentive to obesity" and further eluded to "drilling fat people for fuel" (134). Unfortunately, such offensive rhetoric is not unusual in media portrayals of obesity, which help shape social norms and negative attitudes about weight (122). Given the mass consumption of media in our culture, it is not surprising that stigmatizing attitudes toward overweight people are so common in our society.

In addition to the evidence presented above, there are other media outlets that undoubtedly influence how the public views obese individuals. For example, some studies suggest that weight-related content in magazines fuels both society's drive for thinness and aversion to excess weight (135,136). Others have discussed the implications of weight loss reality television programs for falsely reinforcing notions of the controllability of weight (137,138). Interestingly, for nearly two-thirds of the American population, the only format on television where they will see people who have similar bodies to themselves is on shows where the entire cast is trying desperately to become thin. Recent weight loss reality television programs have also been directed toward children. Studies that assess how these shows impact viewer's psychological and physical health are needed. Other forms of media, such as video games, the Internet, and public health campaigns have yet to be studied to determine the nature of their stigmatizing content. Future research should analyze weight stigmatization in this broader context of the media. It will be important to identify the effect of weight bias in the media on public attitudes and behaviors, and to determine effective strategies to reduce stigmatizing content in the media.

UNDERSTUDIED DOMAINS OF WEIGHT BIAS

In 2001, Puhl and Brownell noted several understudied domains in which obese persons may be vulnerable to weight discrimination, including public accommodations, jury selection, housing, and adoption (2). These topics had emerged primarily in the media or in legal cases on public record, but no research had tested these issues. In the years since that time, the absence of science on these topics has remained unchanged. However, there has been increasing media attention to weight bias in new domains, such as proposed airline policies to charge obese travelers additional fees because of their excess weight (139,140) or for extra seats (141–143), and to terminate overweight flight attendants because of their weight (144). In addition, several companies have announced plans to impose financial penalties for obese employees if they are unable to meet predetermined BMI standards (145). There have also been cases highlighted in the media of obese patrons being the target of weight bias in restaurants (146), public health clubs (147), and cases of qualified obese adults being denied rights to adopt a child (148) or parents who have lost custody of their obese child (149). Still, no studies on these topics have been published, and the nature and extent of weight bias in these settings remains unknown. Given that these issues have received increasing media coverage, and in some cases national and international press attention

(140,142,144–146), it seems warranted to pursue scientific studies to document and clarify experiences of weight bias in these domains of daily living.

One recent study examined weight discrimination in customer service interactions, a topic that has not been previously studied. In two experiments, King and colleagues found that confederate obese shoppers faced more interpersonal discrimination from sales personnel in retail stores than nonoverweight confederate shoppers (24). In addition, when confederates wore casual attire, levels of interpersonal discrimination increased toward obese shoppers compared to when they wore professional attire. In a second experiment, interpersonal discrimination was greater toward obese confederates who were drinking a high-calorie beverage compared to obese confederates who provided evidence that they were trying to control their weight (by consuming a diet drink). In a third study, actual customers in a shopping area ($N = 191$) were surveyed about their shopping experiences, and obese customers reported higher levels of interpersonal discrimination than nonoverweight customers. Reports of greater interpersonal discrimination were associated with less time and money spent in the store than initially intended, and a lower likelihood of returning to the store in the future.

These findings suggest that subtle and covert forms of interpersonal discrimination may be common experiences for obese persons in typical activities of daily living. More work is needed to examine weight bias in customer service interactions, in addition to public accommodations and other domains mentioned above where obese persons may be disadvantaged. Addressing these understudied areas of weight bias will be important to obtain a comprehensive understanding of the multifaceted experiences of overt and covert forms of discrimination faced by obese persons.

PSYCHOLOGICAL AND PHYSICAL HEALTH CONSEQUENCES OF WEIGHT BIAS

Given the accumulation of literature documenting weight bias in multiple domains of living, it is critical to determine its impact on emotional and physical health outcomes for overweight and obese individuals. There has been increasing research attention to the consequences of weight bias in recent years, with studies beginning to examine the moderating role of stigmatizing experiences on psychological functioning and health behaviors. Although this science is still in its infancy, recent studies suggest that weight bias may contribute to psychological distress and unhealthy behaviors. The findings in this area summarized below.

Psychological consequences

Depression. Risk factors that increase vulnerability to depression among obese individuals have not yet been clearly established. However, it has been suggested that weight stigmatization may be one of these factors (150), and that weight-based teasing may be a plausible mediator in the relationship between obesity and depression (151). Emerging evidence supports this suggestion in both clinical and nonclinical samples of obese persons. Friedman *et al.* found that frequency of weight stigma experiences was positively associated with depression in a sample of 93 treatment-seeking obese adults, even after controlling for the effects of age, gender, age of obesity onset, and BMI (152). Retrospective research has demonstrated that a history of appearance-based teasing in childhood was associated with depression among adult women with binge-eating disorder (BED) (153,154), and among patients with bulimia nervosa (154).

Studies of obese patients seeking weight loss surgery demonstrate similar findings. Chen and colleagues assessed the degree to which elevated depressed mood was associated with weight-based stigma among surgery seeking obese patients ($N = 60$), and found that experiences of weight stigma contributed unique variance to depressed mood above and beyond BMI, gender, age of onset of obesity, physical disability, and binge-eating status (155). Experiences of weight stigma independently contributed 32.6% of the variance in depression scores. Another study examined the relationship between childhood weight-based teasing and psychological functioning in 174 bariatric surgery candidates, demonstrating that teasing history was associated with higher levels of depression, even after controlling for childhood onset of obesity (156). These findings suggest that it is not just the history of being overweight in childhood that is important, but that weight-based teasing may play a key role in vulnerability to depression.

In addition to these studies of weight-based teasing, recent research assessing specific weight-based stigmatization experiences (using the *Stigmatizing Situations Inventory*, (157)) show similar results in weight loss surgery samples. In one study of obese surgery candidates ($N = 94$), many reported weight-based stigmatization within the past month, with the most common experiences being environmental barriers (e.g., chairs that were too small, or not being able to find medical equipment in an appropriate size) and interpersonal attacks, which were positively correlated with depression (158). In another study (using the same assessment measure), stigmatization reported among bariatric surgery candidates ($N = 117$) was associated with greater symptoms of depression, even though the most common forms of weight-based stigma were reported to occur less frequently (159).

Among community-based samples, similar findings have emerged. Annis and colleagues demonstrated that overweight women ($N = 58$) with more frequent experiences of weight stigmatization in childhood, adolescence, and adulthood were more likely to report depressive symptoms (160). Carr *et al.* examined the relationship between obesity and emotional well-being in a nationally representative sample of 3,353 American adults (161). More than 40% of obese individuals with a BMI of $\geq 40\,kg/m^2$ reported being mistreated due to their weight, and this was significantly associated with impaired mood. Regression analyses demonstrated that obesity itself was not distressing, and that obese persons reported better emotional health than thinner peers after controlling for a number of obesity-related stressors. Thus, these findings suggest

that excessive weight by itself is not necessarily distressing, but that interpersonal mistreatment due to weight may lead to negative affect.

Finally, a recent study examined the relationship between perceived weight discrimination and psychiatric disorders in sample of obese persons (N = 9,327) from the National Epidemiologic Survey on Alcohol and Related Conditions (a nationally representative study of US adults) (M.L. Hatzenbuehler, K.M. Keyes, D.S. Hasin, personal communication). Perceived weight discrimination was significantly associated with a current diagnosis of mood and anxiety disorders, controlling for sociodemographic characteristics and perceived stress. In addition, weight discrimination was associated with an increased likelihood of mental health services use. Unfortunately, social support did not protect individuals from the negative psychological consequences of perceived weight bias.

Self-esteem. Weight bias may also mediate the relationship between obesity and self-esteem. Annis and colleagues examined self-esteem and stigma among three nonclinical groups of women (N = 165) (160). Equivalent degrees of stigmatization were reported by women who were currently and formerly overweight, and more frequent stigmatization throughout their lifetime was correlated with lower self-esteem. In a nationally representative sample of over 3,000 adults, Carr and Friedman found that obese individuals reported lower levels of self-acceptance than normal-weight persons, which was fully mediated by perceptions of weight discrimination (11).

Studies examining obese treatment samples have demonstrated that a history of appearance-based teasing is related to lower self-esteem (153), and that greater frequency of stigmatization experiences predicts low self-esteem even after controlling for differences in psychological functioning due to age, gender, age of obesity onset, and BMI (152). Similar findings have been documented for bariatric patients, where teasing history was associated with lower levels of self-esteem, after controlling for age of obesity onset (156), and among bulimia nervosa patients (154). However, the authors note that different associations may emerge between teasing and psychological functioning (e.g., self-esteem) depending on the type of eating disorder symptoms present.

Interestingly, low self-esteem may also be present among those who express negative attitudes toward obese individuals. In a study of undergraduates (N = 107), self-esteem was correlated negatively with antifat attitudes and negative stereotypes toward obese individuals (162). This relationship was mediated by internal attributions about the causes of obesity. In addition, the authors found that the relationship between self-esteem and beliefs that weight is within person control was mediated by the extent to which the thin ideal was internalized by participants. More work is needed to clarify this relationship, and to determine how experiences of stigma, internalization of bias, and expressions of negative attitudes are each related to self-esteem.

Body image dissatisfaction. Weight bias may play an important role in fostering poor body image among obese individuals. Several studies have documented significant, positive associations between experiences of weight stigma and body dissatisfaction, among both nonclinical samples (160,163) and clinical samples of obese persons (152,153,164), and even after controlling for a range of variables such as BMI, gender, age, obesity onset (152,156). Other research indicates that weight-based teasing in adulthood may be particularly relevant in predicting body dissatisfaction compared to weight-based teasing in childhood, which has not been found to be associated with body image among clinical samples of obese women (164–166).

Some research suggests that weight stigma may have different implications for body image among women and men. Grilo and Masheb examined predictors of body dissatisfaction in a sample of 343 patients (78% females) with BED (167). Despite there being no gender differences for age of onset of overweight, teasing experiences, self-esteem or depression, findings indicated that childhood teasing about weight was a significant predictor of body dissatisfaction for women, but not for men.

Recent research has begun to examine the relationship between weight bias and body dissatisfaction among different cultural groups of women, which may be especially important given that levels of body acceptance and body satisfaction may differ among certain ethnic groups (168). Shroff and Thompson examined this issue in female undergraduates from India (N = 93), and found that a history of weight-based teasing mediated the effect of BMI on body dissatisfaction (169). Reddy and Crowther similarly found that weight/shape teasing was significantly related to body dissatisfaction and maladaptive eating attitudes among 74 South Asian American women (170). Body dissatisfaction mediated the relationship between weight/shape teasing and maladaptive eating attitudes. These findings suggest that Indian- and South Asian-American women, like European-American women, experience negative consequences of weight-based teasing.

As with recent findings on self-esteem, some research also suggests that expressing weight bias may be related to body image dissatisfaction. In a sample of 264 young women (94 European Americans and 170 Latinas), those with high levels of body dissatisfaction and eating concerns reported higher levels of prejudice toward overweight and obese persons (171). However, whereas higher levels of body dissatisfaction were associated with worse antifat attitudes among Latinas who preferred English, this was not the case for Latinas who preferred Spanish, where higher body dissatisfaction was related to lower antifat attitudes. This suggests that level of acculturation (as indicated by language-use) could act as a protective factor for antifat attitudes. Additional research is needed to identify the impact of weight bias on body image for adults of different ethnic backgrounds, and to examine weight bias and body image in men.

Coping strategies and psychological well-being. It is important to consider the kinds of coping strategies that people use in response to weight bias, which may have important implications for the emotional

impact of stigma (5). One study of overweight and obese adults (N = 2,449) found that frequency of weight stigmatization was unrelated to psychological functioning (9), but showed that coping strategies used to deal with stigmatizing situations were related to psychological well-being and distress. For example, women who used positive coping strategies to deal with bias (e.g., positive self-talk and obtaining social support) reported healthier psychological adjustment, whereas negative coping responses were associated with higher distress. In addition, coping strategies emerged as the only significant predictor of self-esteem, even after controlling for current and previous weight, age, and beliefs about obesity. For men, coping with weight bias through self-acceptance was associated with higher self-esteem, and coping with avoidance, negative self-talk, and crying were related to lower self-esteem. At the same time, certain coping strategies which appeared to be adaptive, such as positive self-talk and using religion or prayer, were related to higher depressive symptoms among men, and strategies such as crying and ignoring the situation, were related to lower levels of depression. Although these findings seem counterintuitive, they are similar to previous work (157) showing that some "positive" coping strategies were not clearly related to positive mental health.

Thus, it is plausible that coping strategies used to deal with stigmatizing experiences contribute as strongly to psychological well-being as the stigmatizing situation itself. These findings highlight the need for further study to determine what factors constitute "effective" coping methods with weight bias in various stigmatizing encounters, and whether positive vs. negative coping responses impact emotional adjustment differently across gender.

Summary and methodological limitations

Weight bias has concerning implications for psychological well-being of obese individuals, and may increase vulnerability to depression, low self-esteem, poor body image, and other psychiatric disorders. Strategies used to cope with weight bias may also affect emotional outcomes, although it is not yet clear how different forms of coping influence levels of distress.

This relatively new area of research raises many important research questions regarding the impact of weight bias on emotional health. Longitudinal studies are needed to determine whether, and to what degree, experiences of weight stigma are responsible for increases in psychological symptoms, and to examine the effects of childhood weight-based teasing over time. It will also be important to examine whether experiences of weight stigma lead individuals to seek weight-loss surgery, and how various coping strategies can alleviate or increase the negative consequences of stigma. Most studies to date have used cross-sectional designs with primarily white female participants. Thus, research with more diverse samples can begin to identify the links between weight bias and psychological outcomes for individuals of different ages, sex, and ethnic backgrounds.

Physical health consequences

Another important avenue of research is to determine whether, and to what extent, weight bias affects physical health outcomes. Relatively few studies have examined these questions, but emerging research over the past several years suggests that weight bias may increase vulnerability to maladaptive eating behaviors and avoidance of physical activity, both of which may ultimately reinforce additional weight gain and obesity. This new area of research is summarized below.

Eating behaviors. Several studies have examined the relationship between experiences of weight bias and binge-eating behaviors. One study of 1,013 adult women (who were members of a weight loss support organization) found that those who internalized negative weight-based stereotypes reported more frequent binge-eating and refusal to diet as responses to weight bias compared to individuals who did not internalize stereotypes (172). Stigma experiences and internalization of weight-based stereotypes did not predict engagement in weight loss strategies in this sample. Jackson and colleagues found that women with BED (N = 115) who reported a higher frequency of general appearance-based teasing experienced more frequent binge-eating and eating restraint (153). Among women who were obese, general appearance-based teasing was also positively associated with binge-frequency. Another study showed that recent experiences of weight-based stigmatization were associated with a diagnosis of BED in a sample of obese adults (N = 94) seeking weight loss surgery (158). Similarly, other recent work demonstrated that stigmatizing experiences significantly predicted binge-eating behavior among treatment-seeking obese adults (N = 93), accounting for 20% of the variance in binge-eating (173). However, findings also suggested that psychological distress may be an important mediator, as the association between stigmatizing experiences and binge-eating was reduced when the effects of psychological variables were controlled. Thus, it may be that experiences of stigma increase vulnerability to poor psychological functioning which in turn increases risk of binge-eating behaviors.

Among nonclinical samples, similar findings have emerged. Annis and colleagues observed a positive association between frequency of weight stigmatization and binge-eating behaviors among overweight women (160). Womble *et al.* tested a psychosocial model of binge-eating symptoms among 808 young adults (55% women), and found that the best fitting model for binge-eating involved an interaction of variables including weight-based teasing, weight cycling, body dissatisfaction, negative affect, and dietary restraint, which accounted for ~70% of the variance in both women and men (174). Weight bias may be associated with other types of maladaptive eating. A recent study of 203 undergraduates (64% females) found that weight-based teasing was related to eating disorder symptoms, and was more strongly related to dysfunctional eating cognitions than depressive cognitions (175). Teasing about weight has also been documented as a contributor

in emergent bulimic symptoms among Spanish females ($N = 153$) (176).

Other research with clinical samples has reported mixed findings, suggesting a more complex relationship between weight bias and eating behaviors. Rosenberger and colleagues examined correlates of childhood weight-based teasing in 174 bariatric surgery candidates, and found no differences in the frequency of binge-eating or dietary restraint among patients who reported a history of weight-based teasing in childhood vs. those who were not teased (156). Jackson and colleagues assessed the association between eating disorder symptoms and a history of being teased about weight or appearance in a sample of 32 female patients with bulimia nervosa and 32 patients with BED (matched for BMI and age) (154). Patients with bulimia nervosa reported a higher frequency of weight-based teasing than patients with BED, but both groups had similar levels of general appearance-based teasing. However, teasing was unrelated to most eating disorder features in both groups (with the exception of dietary restraint, which was associated with general appearance-based teasing in BED patients only).

Only one study has begun to examine the relationship between stigmatization and weight loss outcomes (177). Participants were 185 adults in the Trevose Behavior Modification Program; an obesity treatment model that includes the unusual strategy of requiring members to lose a prescribed minimum amount of weight each month (or to maintain weight loss after reaching their goal weight), and members who do not meet these standards are subject to dismissal from the program. Findings showed that higher initial BMI, more stigmatizing experiences, lower body dissatisfaction, and greater fear of fat were associated with greater weight loss in this sample. Surprisingly, despite negative psychological correlates of stigmatization documented among participants, more frequent stigmatizing experiences also predicted greater weight loss. The authors caution generalizability of these results due to several factors, including the atypical sample of participants who were willing to tolerate the consequences imposed by the program rules, and that at the time of assessment participants had been enrolled in the program for 2 months and had already lost weight (31% of participants had reached 90% of their weight loss goal). Due to the concurrent assessment of variables, the direction of causality is also uncertain from these findings, and additional research is clearly needed to assess how stigma impacts long-term weight loss.

Finally, coping responses used in reaction to weight bias may also have implications for eating behaviors. In a study of 2,449 overweight and obese women, 79% of participants reported coping with weight bias on multiple occasions by eating more food, 75% reported coping by refusing to diet, and 63% reported coping through attempts at dietary restraint (9). Thus, reactions to weight bias, in addition to the stigmatization itself, may influence eating patterns. It will be important for additional studies to clarify these relationships.

Physical activity. Several studies have begun to document reduced participation in (and avoidance of) physical activities among youths who experience weight bias (92,178,179), but to our knowledge, only one published study has examined this relationship among adults. Vartanian and Shaprow examined the relationship between experiences of self-reported weight stigma, exercise motivation and exercise behaviors among 100 female college students (164). Stigma experiences were positively correlated with motivation to avoid exercise, even after controlling for BMI and body dissatisfaction. Avoidance of exercise was in turn associated with less frequent moderate and strenuous exercise. There was not a direct association between weight stigma and self-reported exercise behaviors, which may be attributed to the low levels of obesity among sample participants. Additional research is needed to test whether weight stigma impacts exercise behaviors at higher levels of obesity.

Cardiovascular health outcomes. Weight bias may impact other indices of physical health. Although no research has yet tested this relationship in adults, limited work has documented links between perceptions of appearance-based stigma and cardiovascular health indices in adolescents (180). It may be that weight bias creates higher levels of general stress, which in turn increases cardiovascular reactivity and vulnerability to negative health outcomes—see discussion by Puhl and Latner (8). Indeed, research has documented increases in physiological stress and cardiovascular reactivity in response to racial discrimination (181,182), as well as increased vulnerability to abdominal obesity and glucose intolerance among Dominican women who internalize negative racial stigma (183). In recognition of evidence demonstrating that stigma-induced stress may mediate the relationship between obesity and health, some researchers have proposed that psychological stress induced by weight stigma, in particular, may be a specific etiologic agent in the pathophysiology of obesity (184). This hypothesis needs to be tested, and there is much to learn about the relationship between the potential stress induced by weight bias and its effects on physical health outcomes.

Summary and methodological limitations

Evidently, more work is needed to determine the ways in which weight stigma is related to eating behaviors and physical activity. Although many questions remain in this new area of research, the existing evidence is sufficient to challenge common perceptions that stigma may motivate healthy eating behaviors, and instead suggests that bias may increase maladaptive eating behaviors, exercise avoidance, and in some cases reduce motivation to lose weight. Studies that assess the impact of stigmatization experiences on weight loss treatment outcomes are clearly a priority.

It will also be useful for future research to identify the degree to which weight bias increases vulnerability to psychological and physiological stress, and how this stress in turn relates to indices of cardiovascular health. There may be

important knowledge to be gained from existing studies on racial stigma and its impact on health, and whether parallels can be identified for health outcomes of individuals who experience weight bias.

STIGMA-REDUCTION RESEARCH

The importance of identifying effective methods to improve attitudes and reduce bias cannot be understated. Yet, the number of studies testing bias-reduction strategies pales in comparison to the amassing literature documenting weight stigma in multiple settings. Only a handful of experimental studies targeting bias-reduction have been published, yielding mixed findings (refer to (8) for review of bias-reduction studies targeting youth).

Several experimental studies have attempted to improve attitudes among adults by addressing attributions about the causality of obesity. One study provided participants with written information that emphasized biological, genetic, and noncontrollable causes of obesity, which significantly improved participants' attitudes compared to a control group. In addition, when participants were provided with information emphasizing internal, controllable causes of obesity, negative attitudes worsened further (124). These findings parallel previous work documenting improved attitudes following an intervention that highlighted external, noncontrollable reasons for obesity (123). However, other experimental research has found this method to have little impact on improving negative attitudes in adults (7). Given that many weight-based stereotypes (e.g., laziness, lack of willpower) stem from perceptions that the causes of obesity are within personal control, more empirical work is needed to test whether, and in what circumstances, strategies targeting causal attributions can effectively reduce bias.

Experimental research has also attempted to reduce weight bias by evoking empathy toward obese individuals. In one study, participants (N = 153) read first-person narratives of obese individuals who had experienced weight discrimination (7). This did not improve attitudes compared with control conditions (e.g., reading a story of discrimination toward an individual in a wheelchair, or a control condition with a neutral story about a nonstigmatized person), but did reduce implicit bias among overweight participants. A second study tested a media-based empathy intervention where participants (N = 108) viewed either an empathy-evoking video of obese persons or a nonweight related control video, followed by additional videos of obese persons who were presented positively (e.g., as competent) or negatively (e.g., as clumsy) (185). The videos evoking empathy were ineffective in improving implicit and explicit antifat attitudes. Given that empathy induction has been demonstrated to be an effective strategy for promoting positive attitudes toward other stigmatized groups (186), it may be that certain forms of bias, such as obesity, are resistant to these strategies.

The fact that weight bias persists in the face of bias-reduction interventions highlights the complexity of this problem. Multiple strategies may be required to combat negative attitudes and reduce weight bias. In a recent study, kinseiology undergraduates (N = 95) completed a 6-week bias-reduction intervention consisting of didactic lectures, group discussion activities, and hands-on learning projects, where topics related to weight bias were embedded in a course related to fitness and sport testing (187). Lecture content included multiple components such as raising awareness of weight bias, invoking empathy, redefining professional practice and weight loss ideals with approaches that emphasize healthy lifestyles, and challenging perspectives that blame obese individuals for their weight. Overall, there was a significant positive change in students' antifat attitudes regarding whether people are responsible for their weight, which reduced stereotypes of blame toward obese persons. The authors suggest that these findings may have resulted from aspects of the intervention that emphasized multiple barriers that obese people confront in making healthy lifestyle changes. However, other stereotypes (e.g., perceptions that obese persons are lazy) did not improve following the intervention. In addition, the lack of control group prevents determination of which aspects of the intervention were most or least effective, as different components were not compared or tested separately. These findings parallel previous research that reduced negative weight-based stereotypes among medical students (N = 75) through an educational intervention with multiple techniques including empathy induction, education about the noncontrollable causes of obesity, and role-play exercises (188). Again, because no control group was used for comparison, it is unclear which aspects of the intervention contributed to attitude change.

Educational interventions delivered through the Internet may be another strategy for improving attitudes. Hague and White tested an educational intervention delivered through an online course, which covered topics including the causes of obesity, consequences of weight stigma, social pressures to be thin, strategies to reduce weight bias in school settings, and ways to help students cope with stigma (189). Participants (258 student teachers and school teachers) who enrolled in the online course were randomly assigned to either a control group or one of four intervention conditions that manipulated the perceived credibility and body size of the course presenter who provided the online lectures. Participants' attitudes improved in all intervention groups, and exposure to a credible overweight presenter improved attitudes more than a credible nonoverweight presenter. These results are encouraging and suggest that Internet-based interventions may have potential to reduce weight bias. However, it is not known which specific topic areas of the course most strongly influenced attitude changes, and more work is needed to clarify the most effective intervention components.

Finally, some experimental research has tested a "social consensus" approach to reduce weight bias. This model proposes that stereotypes and stigma are a function of one's perceptions of others' stereotypical beliefs (190). In three experimental studies, university students completed self-report measures of attitudes toward obese people prior

to and following manipulated feedback depicting the attitudes of other students (124). In a first experiment, participants (N = 60) who received favorable consensus feedback (suggesting that others held more favorable beliefs about obese people than they did) reported fewer negative attitudes and more positive attitudes toward obese persons, and attributed obesity less to personal control compared to their reported attitudes prior to feedback. In a second experiment (N = 55), participants who received favorable consensus feedback were more likely to improve their attitudes about obese people if this feedback came from an in-group source with whom participants identified (e.g., students who belonged to their university) vs. an out-group source (e.g., students from a different college). In a third experiment, the social consensus approach remained predictive of positive attitude change for participants (N = 200) when this method was compared to other stigma-reduction interventions (such as providing causal information about obesity). These experiments indicate that learning about the positive attitudes of others can be effective in improving attitudes toward obese people.

More recent experimental research with university students (N = 270) has extended these findings, demonstrating that when one person condemns or condones discrimination toward a stigmatized group (including obese individuals), others will follow suit (191). This study found that simply overhearing an unknown peer briefly express views about discrimination produced attitude change in peers that remained at 1-month follow-up. Thus, even when attitudes are communicated in a single, brief social encounter by an unknown person, there can be a lasting impact in people's views over time. Social influence and social norms appear especially important in efforts to reduce discriminatory attitudes toward obese persons, and additional research in this area is warranted.

Summary and methodological limitations

In summary, these studies suggest several possible avenues for stigma-reduction strategies, but raise many questions about how to successfully overcome negative attitudes toward obese people. With so little research on this topic, the most effective methods of reducing weight bias cannot yet be identified. More work is clearly needed to examine key factors that are necessary for effective stigma reduction, and to determine whether there are particular approaches, or combination of strategies, that may work better than others in certain circumstances or populations. Most of the work thus far has tested interventions among white college samples, with little or no attention to the effect of interventions on sustainability of attitude modification over time, how interventions impact actual behavioral changes, or comparison of existing bias-reduction methods. These are all important avenues for future research.

THE STATUS OF LEGISLATION TO PROHIBIT WEIGHT DISCRIMINATION

Unfortunately, considerable legal challenges remain for individuals who have experienced weight discrimination. In the past decade, no new state or federal laws have been passed on this issue. The District of Columbia, and the California cities of San Francisco and Santa Cruz include body size in human rights ordinances (192), but Michigan remains the only state that prohibits employment discrimination on the basis of weight (193). Thus, although lawsuits alleging weight-based discrimination appear to be increasing (194) overweight and obese individuals are primarily alone, and face significant obstacles, in their efforts to seek redress in court for wrongful discrimination.

Due to the lack of legislation expressly prohibiting weight discrimination, individuals must bring suit under existing laws prohibiting discrimination on other characteristics. The most common statute for these purposes has been the Americans with Disabilities Act, which continues to provide general nondiscrimination protection for persons with disabilities (193). However, for obese individuals to qualify under this statute their obesity must meet the definition of a disability and be established from a physiological cause, making it difficult for most people to successfully bring discrimination claims (195,196). Thus, with the exception of a few individuals who have filed claims and whose body weight qualified them as "disabled" under the Americans with Disabilities Act definitions (197), employers continue to have legal freedom to discriminate against job applicants or employees on the basis of weight (198).

One alternative approach for protection under the Americans with Disabilities Act involves proof that the plaintiff's obesity is *perceived* by others (e.g., employers) to be disabling, even if no actual impairment exists, and that the individual was subject to weight discrimination on the basis of such perceptions (199,200). Although relatively few cases have been filed using this approach (200), and only "morbid obesity" is potentially protected as a "perceived disability" status (14), there has been an increase in the number of perceived disability discrimination claims in recent years (199) with obese plaintiffs achieving more success than cases where obesity-related actual disability claims are filed (199). There is some concern that the Americans with Disabilities Act could create additional stigma and backlash by suggesting that obesity is a disabling condition (193). Overall, disability laws fail to adequately address weight discrimination, and protection for obese individuals remains very limited (14,201,202).

Meaningful legal remedies are clearly needed to protect against weight discrimination, both at a state and federal level. The accumulation of science documenting weight prejudice over the past several decades provides ample justification for legal action. Unfortunately, legislation is lagging far behind the science. In 2007, Massachusetts introduced legislation (House Bill 1844) to prohibit weight-based discrimination in employment settings. Although virtually all testimony at the hearing was in favor of the bill, it did not pass out of the Labor and Workforce Development committee, and will be re-filed in the next legislative session. Clear efforts are needed to

Table 2 New and ongoing research needs in weight bias research

Domain	Research needs
General methodology	Evaluate the reliability and validity of measures assessing weight bias
	Increase longitudinal prospective studies to examine weight bias over time
	Assess behavioral expressions of weight bias and discrimination
Employment	Assess discriminatory practices in promotions, benefits, insurance, and wages for obese employees
	Assess generalizability of experimental studies to real-life hiring practices of overweight/obese employees
	Examine how characteristics of obese applicants (e.g., race, gender, age, job type) affect employment decisions
	Survey obese employees about perceptions of discrimination experienced in the workplace
	Identify and test strategies to reduce weight bias in employment settings
Health care	Assess provider attitudes and behaviors toward obese patients using experimental research designs
	Examine how provider attitudes impact clinical practice and quality of health care for obese patients
	Survey obese patients about stigma experienced in health care and its impact on health-care utilization
	Identify whether/how the medical office setting (e.g., size of equipment) affects health care for obese patients
	Identify and test strategies to improve provider attitudes and provider–patient communication with obese patients
	Determine whether experiences of weight stigma lead individuals to seek weight-loss surgery
Education	Document nature and extent of weight bias among educators and school staff
	Survey obese individuals about stigmatizing experiences in educational settings
	Examine the impact of weight bias from educators/classmates on academic outcomes of obese students
	Identify and test strategies to improve the school climate for obese students
Interpersonal relationships	Document the nature and extent of weight bias in familial, romantic, and peer relationships
	Clarify differences in social support and social networks between obese and nonobese persons
	Examine the impact of weight bias from interpersonal sources on emotional and physical well-being
Media	Examine weight bias in new media forms (e.g., video games, Internet, advertising, and reality television)
	Assess the impact of weight bias in the media on public attitudes/behaviors toward obese persons
	Examine how weight bias in the media affects well-being of obese children and adults
	Identify the nature/extent of weight bias in public health and/or weight loss social marketing campaigns
Psychological consequences	Assess longitudinally whether/how weight stigma contributes to psychological symptoms
	Examine the effects of childhood weight-based teasing over time
	Examine how various coping strategies alleviate or increase the negative consequences of weight stigma
	Identify links between weight bias and psychological outcomes for different ages, sexes, and ethnicities
	Assess the impact of internalized stigma/stereotypes on psychological well-being
Physical health consequences	Examine longitudinally whether/how weight stigma contributes to physical health outcomes
	Identify whether/how weight bias increases vulnerability to physiological stress and cardiovascular health
	Identify links between weight bias and physical health across age, sex, ethnicity
	Clarify links between experiences of weight bias and unhealthy eating behaviors/exercise avoidance
Stigma reduction	Develop, test, and compare effectiveness of stigma-reduction strategies to reduce weight bias in multiple settings
	Evaluate sustained attitude and behavior changes over time following stigma-reduction interventions
	Identify stigma-reduction strategies that lead to positive behavioral changes
Legislation	Assess public awareness and utilization of existing local/state laws to prohibit weight discrimination
	Assess public attitudes and barriers toward legislation to prohibit weight discrimination
Understudied topics	Document the nature and extent of weight bias in public accommodations, housing, adoption, jury selection, modes of transportation, health insurance coverage, restaurants, health clubs, and others.

disseminate the science on weight bias to help mobilize legislation to ensure that obese persons receive the equitable treatment they deserve.

DISCUSSION

The aim of this systematic review was to provide an update of the existing evidence concerning weight bias and stigmatization toward overweight and obese adults in important domains of living. Since the previous review on this topic in 2001, the growing literature

indicates that weight bias remains persistent in settings of employment, health care, and education. Expanding beyond these domains, recent studies also demonstrate the presence of weight bias in the media and in close interpersonal relationships with family members and romantic partners, and indicate that bias and stigma pose threats to emotional and physical health of obese individuals. **Table 1** summarizes key findings of existing studies and categorizes these findings based on the amount of evidence to date.

These sobering findings paint an unfortunate picture for individuals struggling with excess weight who are surrounded with significant societal stigma and its consequences. With no systematic support and little public attention to the issue of weight bias, obese individuals are primarily left on their own to confront and cope with ongoing injustice. As researchers and health-care providers in the obesity field working to improve the lives of obese individuals, we cannot ignore the importance of addressing weight bias in these efforts, which must be considered alongside goals for effective prevention and treatment of obesity.

Important advancements in research have occurred since the 2001 review of literature on weight bias. More studies have surveyed obese individuals about their personal experiences of stigma, providing clearer evidence that obese persons perceive stigma and stereotypes in multiple settings. Increasing experimental studies have assessed weight bias in employment and health care, helping to establish unfair treatment of obese persons solely on the basis of their body weight. Emerging population-based studies using large representative samples have begun to document the prevalence of weight bias and discrimination, and demonstrate discriminatory practices in areas such as lower wages and hiring practices for obese employees, as well as disparities in educational attainment of obese individuals. There has also been an increase in studies published outside the United States documenting weight bias in various settings (e.g., health care), showing that obese persons are vulnerable to stigma in other countries and cultures.

Of critical importance is research assessing the impact of weight bias on psychological and physical health, an area that has received little attention until recently. The emerging research thus far suggests that weight bias increases vulnerability to depression, low self-esteem, poor body image, maladaptive eating behaviors, and exercise avoidance. These negative consequences challenge societal notions that stigma may serve a positive function of motivating healthy eating behaviors, and instead suggest that bias may impair efforts to engage in healthy lifestyle behaviors through negative emotional distress and unhealthy eating patterns.

Despite the accumulation of science in recent years, important gaps in research remain.

It will be particularly important for future research to examine the effects of weight bias and discrimination on other indices of physical health, such as cardiovascular health and physiological stress. Longitudinal studies are needed to examine the impact of weight bias over time, and to identify how various coping strategies alleviate or increase the negative consequences of weight stigma. More work is needed to examine the nature and extent of weight bias in interpersonal relationships, and how internalization of stigma influences psychological and physical well-being. **Table 2** outlines these and other new research questions that are needed to make meaningful contributions to this area of study, and to move the field forward.

Perhaps needed most are studies to develop, test, and compare effectiveness of stigma-reduction strategies to reduce weight bias in multiple settings. The number of studies testing strategies to reduce weight bias is few, and pales significantly by comparison to the amount of research now documenting weight bias from many sources. Of the few studies that exist, weight bias appears to be a challenging stigma to reverse, and may be resistant to interventions that have successfully improved attitudes toward other stigmatized groups. It is likely that multiple stigma-reduction strategies will be needed to shift negative societal attitudes about obese persons. This may require education about the complex causes of obesity and the harmful consequences of stigma, recognition of the difficulties of obtaining significant and sustainable weight loss, efforts to challenge weight-based stereotypes, promotion of weight tolerance in multiple settings where bias is present, and legislation to prohibit inequities based on body weight.

Unfortunately, it does not appear that the increasing prevalence of obesity has attenuated negative societal attitudes toward obese people. In contrast, the growing science on this topic demonstrates that weight bias persists and has expanded to other domains of living previously unstudied, and may actually be increasing in prevalence. Important research questions continue to remain untested, and organized scientific efforts are needed to fill important gaps of knowledge. Without sufficient attention to this issue in the obesity field and in larger society, it is likely that weight bias will remain both a social injustice and a public health issue, impairing the quality of life for both present and future generations of obese individuals.

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REVIEW ARTICLE

Social Stigma in Diabetes

A Framework to Understand a Growing Problem for an Increasing Epidemic

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Abstract A comprehensive understanding of the social and psychological impact of diabetes mellitus is important for informing policy and practice. One potentially significant, yet under-researched, issue is the social stigma surrounding diabetes. This narrative review draws on literature about health-related stigma in diabetes and other chronic conditions in order to develop a framework for understanding diabetes-related stigma. Our review of the literature found that people who do not have diabetes assume that diabetes is not a stigmatized condition. In contrast, people with diabetes report that stigma is a significant concern to them, experienced across many life domains, e.g., in the workplace, in relationships. The experience of diabetes-related stigma has a significant negative impact on many aspects of psychological well-being and may also result in sub-optimal clinical outcomes for people with diabetes. We propose a framework that highlights the causes (attitudes of blame, feelings of fear and disgust, and the felt need to enforce social norms and avoid disease), experiences (being judged, rejected, and discriminated against), and consequences (e.g., distress, poorer psychological well-being, and sub-optimal self-care) of diabetes-related stigma and also identifies potential mitigating strategies to reduce diabetes-related stigma and/or enhance coping and resilience amongst people with diabetes. The systematic investigation of the experiences, causes, and consequences of diabetes-related stigma is an urgent research priority.

Key Points for Decision Makers

- People who do not have diabetes mellitus do not perceive it to be a stigmatized condition
- In contrast, people who have diabetes report feeling judged and constantly monitored
- Diabetes-related stigma may have negative consequences for psychological well-being, self-care, and clinical outcomes
- Research on this topic is lacking, and limited by an absence of standard operationalization and measurement of stigma

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1 Introduction

Diabetes mellitus affects more than 220 million people worldwide [1] and is increasing at epidemic proportions [2]. Diabetes-related research has focussed largely on management of the physical and medical aspects of the condition but over the past two decades, there has been increased research interest in the psychosocial aspects of diabetes, such as depression [3] and impact upon quality of life [4, 5]. One potentially significant consequence of living with type 1 or type 2 diabetes is the negative social

appraisal, or social stigma, that may be associated with the conditions. While the fact that a person has diabetes is not usually immediately apparent, some of the physical and behavioral features of the condition may be conspicuous, potentially leading to a number of undesirable social, occupational, and emotional consequences.

Stigma is a universal phenomenon and has received substantial research attention in medical conditions such as HIV/AIDS [6–9], epilepsy [10–12] and obesity [13–15], but in diabetes it is relatively under-researched. In the past decade, this issue has begun to receive limited attention, and perhaps research in this area has coincided with publication of landmark studies [16, 17] that have demonstrated that type 2 diabetes can be prevented, which in turn highlights the role of individual behavior in contributing to the development of the condition. This narrative review draws on a wide range of literature regarding health-related stigma in order to develop a framework for understanding the experiences, causes, and consequences of stigma associated with type 1 and type 2 diabetes.

1.1 Theoretical Perspectives on Social Stigma

To assist us to define and conceptualize social stigma, we turn to the theoretical literature. The theoretical perspectives on stigma tend to fall into three categories: namely, social psychological, sociological, or interactionist. Social psychological perspectives on stigma link attributes to undesirable characteristics or stereotypes [18]. Stigmatizing attributes may be visible or invisible, controllable or uncontrollable, and linked to appearance, behavior, or group membership [19]. Sociological perspectives on stigma, on the other hand, tend to describe stigma in terms of characteristics that are socially discrediting and focus on the social conditions that bring about stigma, while interactionist views blend the social psychological and sociological perspectives.

Major and O'Brien [19] have proposed a social psychological model of stigma-induced identity threat. In this model, stigmatized individuals face identity threat when they appraise the demands imposed by a stigma-relevant stressor (e.g., injecting insulin in public) as potentially harmful to their social identity (e.g., being mistaken for an illicit drug user), and as exceeding their resources to cope with those demands. The focus of this model is on how an individual perceives and responds to threats to his or her social identity. As such, this model has a narrow focus (as identity threat is but one component of the self that is affected by stigma) and does not inform us about the causes of stigma. However, the strengths of the model lie in linking social and personal factors to the experience of stigma.

Link and Phelan [20] merge social psychological and sociological explanations in their interactionist conceptualization of stigma, which enables the examination of stigma more holistically than any pure social psychological or sociological conceptualization. The first component in their conceptualization is distinguishing and labeling human differences, which involves categorizing people according to salient characteristics and attributes. In diabetes, the salient characteristics and attributes are usually observable behaviors required to manage the condition (e.g., food choices, injecting insulin, or taking medication) or physical characteristics associated with the condition (e.g., obesity in the case of type 2 diabetes).

The second component of this conceptualization is the linking of categories (with labels) to negative stereotypes (e.g., the stereotype that obese people are lazy). Third, once labels are linked to negative stereotypes, stigma processes lead to a separation of 'us' from 'them' [20], leading to ingroup/outgroup comparisons. This sense that the individuals in the labeled group ('them') are fundamentally different causes stereotyping to take place quickly and, in some cases, become an automated reaction.

Fourth, status loss and discrimination (e.g., being regarded as unreliable employees) are experienced as a result of stereotyping. Members of a stigmatized group may be disadvantaged socially, occupationally, and economically. This corresponds to *enacted stigma*, which refers to episodes of discrimination against people of the stigmatized group. Enacted stigma is contrasted with *felt stigma*, which is the shame of being associated with the stigmatized group and the fear of enacted stigma [21].

Finally, Link and Phelan [20] highlight that stigma is dependent on power—social, cultural, economic, and political power differences between people with the stigmatized condition and people without the stigmatized condition (e.g., the Western cultural values of beauty and youth may be relevant in the case of obesity) [20, 22]. They define stigma as a social process that exists "when elements of labelling, stereotyping, separation, status loss, and discrimination co-occur in a power situation" [20]. Health-related stigma is distinct from general social stigma in that this adverse, social "judgment is based on an enduring feature of identity conferred by a health problem or health-related condition. The judgment is medically unwarranted with respect to the health problem itself" [23]. The strength of Link and Phelan's conceptualization of stigma [20, 22] is that it describes the nature and consequences of stigma. It does not, however, explicate the causes of stigma.

Link and Phelan's ideas provide a useful background to examining the literature about diabetes-related stigma and highlight areas that may require further explication. The theoretical perspectives outlined here provide a foundation to the definition and conceptualization of stigma in general.

We seek to build on this to develop a conceptualization of stigma specifically with regard to diabetes.

2 Aims, Scope, and Literature Review

The purpose of the current narrative review was to develop a conceptualization of social stigma in diabetes that links the causes, experiences, and consequences of stigma, and that identifies potential mitigating strategies to reduce diabetes-related stigma and/or enhance coping and resilience amongst people with diabetes. Our aim was to summarize research about diabetes-related stigma for the purposes of developing a framework for understanding this phenomenon, partially informed by Link and Phelan's conceptualization of stigma [20, 22]. In this review, we summarize and integrate published literature about diabetes-related social stigma, and also literature about health-related stigma in hepatitis C, HIV/AIDS, epilepsy, obesity, and celiac disease. Each of these conditions has chronicity in common with diabetes but also shares another particular feature with diabetes, such as needle use (hepatitis C and HIV/AIDS), behavior perceived as a contributing causal factor (hepatitis C, HIV/AIDS, obesity), seizures and other unusual or conspicuous behavior (epilepsy), and dietary modifications (celiac disease). Furthermore, the stigma associated with obesity and celiac disease may compound diabetes-related stigma, as obesity is a risk factor for type 2 diabetes [24], and celiac disease is more prevalent among people with type 1 diabetes than among the general population [25]. Although it is possible that some people with diabetes experience stigma associated with diabetes-related complications like blindness, having an amputated limb, or being on dialysis, stigma associated with complications was beyond the scope of this review. Our review focusses on stigmatization of the individual with the condition, rather than stigmatization of friends and family by association.

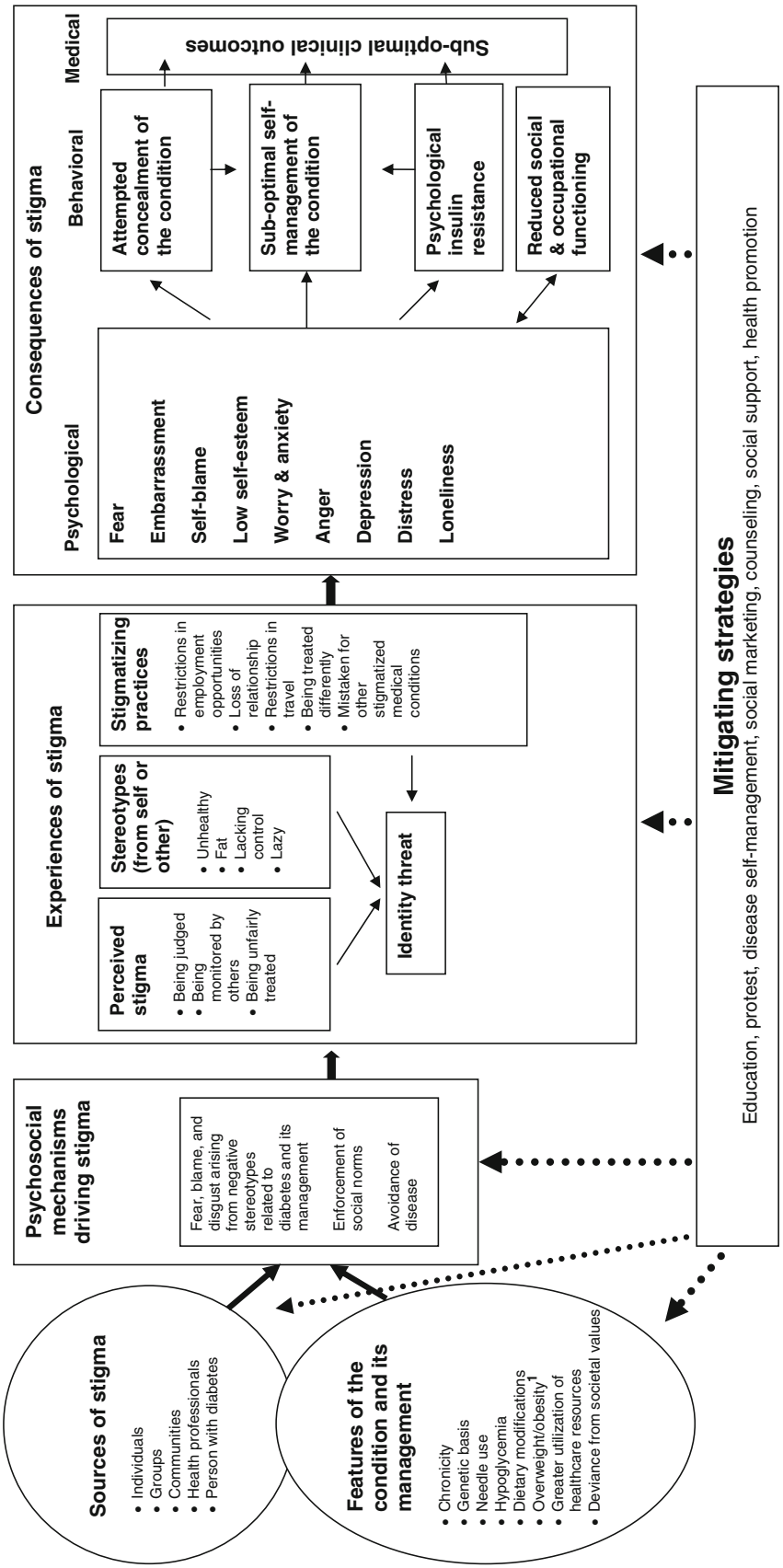
Different elements of society may contribute to or be sources of stigma, from the individual in the community through to the media and to social or health policy. Many of these elements are measurable, including attitudes towards affected people, discriminatory and stigmatizing practices, service availability, legislation, experience of actual discrimination and/or participation restrictions, perceived stigma, and self- or internalized stigma [26]. Stigma that involves the experience or perception of being stigmatized by another is termed 'interpersonal stigma,' whereas self- or internalized stigma is termed 'intrapersonal stigma.' This review focusses on enacted stigma by others, perceived stigma by affected persons, and internalized stigma. Legislation, while important and worthy of further attention, is outside the scope of this review. Furthermore, we focus on the impact on and consequences for people with diabetes only, as the impact on the broader systems and on those who do not have diabetes was also beyond the scope of this review.

We searched the PsycINFO® and Scopus® databases in April 2011 for peer-reviewed articles published in English using each of the keywords 'stigma,' 'discrimination,' and 'social isolation' in combination with each of the following: 'diabetes,' 'hepatitis C,' 'HIV,' 'AIDS,' 'epilepsy,' 'obesity,' 'coeliac disease,' 'celiac disease,' 'health,' 'disease,' 'illness,' 'condition,' 'chronic illness,' and 'chronic condition.' The search combinations that included the keyword 'diabetes' were re-run in May 2012 to ensure no highly relevant literature was missed for the purposes of this review (this search returned only one additional article).

It was evident from our literature review that beliefs about diabetes-related stigma differed substantially between people with and without diabetes. Thus, the evidence is discussed separately below, followed by a discussion of the possible causes, experiences, and consequences of, and mitigating strategies for, diabetes-related stigma. Following this discussion, the ideas and concepts identified in this narrative review are summarized in a diagrammatical representation of a proposed framework for understanding diabetes-related stigma (Fig. 1).

3 Views of People Who Do Not Have Diabetes

In general, people who do not have diabetes tend to perceive diabetes as a non-stigmatized condition. Physical conditions such as diabetes are perceived by many to be less stigmatized than mental illness [27], and the prejudice towards diabetes in the general community is perceived to be minimal [28]. In two studies that asked participants to imagine they had diabetes, one reported little or no expected social stigma [29], and another reported modest levels of expected stigma [30]. In one study, 665 health professionals from six communities of various cultural backgrounds in Australia (Anglo-Australian, Arabic, Chinese, German, Greek, and Italian) answered questions about what they had found to be typical, usual, or average attitudes towards 20 health conditions in their community [31]. Diabetes was consistently rated as one of the four least stigmatized conditions by these health professionals, with HIV/AIDS, mental retardation, psychiatric illness, and cerebral palsy being the four most stigmatized conditions. That healthcare professionals and others who do not have diabetes do not consider diabetes to be a stigmatized condition is not unexpected. Those who do not have diabetes may have limited exposure to stigmatizing behaviors, attributes, or attitudes and may be genuinely unaware of the issue. There may also be an aspect of social desirability bias, which may result in under-reporting of stigmatizing



[1]Type 2 diabetes only

Fig. 1 A framework for understanding diabetes-related stigma

beliefs and practices. The available literature highlights the stark contrast in the perceptions of diabetes-related stigma between those who do not and those who do have diabetes.

4 Experiences and Perceptions of People with Diabetes

People with type 1 and type 2 diabetes need to undertake essential self-care activities to optimize blood glucose levels in order to avoid diabetes-related complications. These activities may include, but are not limited to, monitoring blood glucose levels, injecting insulin, taking medications, eating healthily, and engaging in regular physical activity. However, it is these very activities that are perceived by people with diabetes to be the focus of negative social evaluation. Fear of social embarrassment, rejection, being treated differently, or damaging their relationship with significant others are common concerns associated with injecting insulin [32]. Social embarrassment and stigma, feelings of failure, and guilt are common concerns of people with type 2 diabetes regarding using insulin to manage their diabetes [33]. The perceived social stigma associated with injecting is a contributing factor to psychological insulin resistance (a reluctance to use insulin to manage diabetes) amongst people with type 1 and type 2 diabetes [32, 34]. Adults with type 2 diabetes also report feeling embarrassed when they need to refuse unhealthy food options at social events [35], which may act as a deterrent for making healthy choices in the future. Two qualitative studies provide detailed accounts of the experiences of stigma among people with diabetes [36, 37]. In an interview study, Chinese adults from Hong Kong reported receiving looks of "contempt" from others when injecting insulin in public, being mistaken for an illicit drug user, and feeling that others blame them for causing their own condition [36]. Six of the 13 interviewees reported believing that they would be at risk of losing their job if they disclosed their condition to their colleagues or employer [36]. In a second unstructured interview study, Australian adults with type 2 diabetes told the story of their diabetes from diagnosis to the day of interview [37]. One participant reported negative experiences on a bus tour: he said he was "treated like a leper" ([37], p. 2373) and that all people with diabetes were seated at a separate table and served an extremely limited menu. Some participants also complained about needing a certificate from a doctor to renew their driver's license. Further concerns included being mistaken for a drug user, or as being drunk during an episode of hypoglycemia [37].

Some aspects of diabetes-related stigma may be culturally bound. For example, in addition to restrictions in job opportunities and travel (consistent with above), Japanese adults with type 1 diabetes reported cancelation of marital engagements and divorce following disclosure about their diabetes [38]. It is unclear from the study why this occurred, though we speculate that some possibilities may include not having sufficient information about type 1 diabetes (and therefore being prone to mistaken judgments about management and contagion), not wanting an 'ill' partner, and not wanting to start a family with someone with a hereditary condition. People with diabetes in Ghana indicated that they were often mistaken as having HIV/AIDS due to the weight loss that can result from the onset or sub-optimal management of diabetes [39]. Consequently, other people refused food prepared by them, and attributions of witchcraft or sorcery were reported as common [39]. In one study, British South Asian adults with type 1 or type 2 diabetes reported experiencing difficulty declining offers of sweets in the face of cultural expectations to eat such foods, and that they often experienced pressure from their families to conceal their condition for the purposes of improving their marriage prospects [40]. The findings of these studies highlight the role of cultural beliefs and norms in creating and promoting diabetes-related stigma.

Perceived or experienced stigma can also result in limitations in social and employment opportunities. A qualitative study of adults with diabetes revealed several accounts of workplace discrimination that participants attributed to their health condition [36]. Many further examples of such limitations are evident from the obesity literature, and may be relevant for consideration with regard to diabetes-related stigma given the strong association between obesity and type 2 diabetes. Obese people, particularly women, experience poorer quality romantic relationships [41], and are less likely to be considered as potential sexual partners [42]. Obese people also report higher rates of workplace bias and discrimination than people of healthy weight [43], and are less likely to be invited for a job interview than their healthy weight peers [44]. These limitations and biases may lead to a deterioration of social and/or occupational functioning for people with these stigmatized conditions, which is likely to cause or exacerbate psychological distress and loneliness.

Internalized stigma is portrayed through the feelings, emotions, and self-judgments of people with diabetes, and is particularly relevant for people with type 2 diabetes who express feelings of failure, guilt, and blame [33, 36]. It is unclear from the existing literature whether self-stigma arises from perceived and/or experienced stigma, or, perhaps more likely, whether it may exist independent of perceptions of public views and actual experiences.

Whilst our review of the literature did not identify any studies that examined social stigma in women with gestational diabetes directly, the findings from several qualitative studies indicate that there may be a social stigma

associated with gestational diabetes, which can have adverse effects on well-being [45, 46]. Feelings of personal culpability due to health and lifestyle behavior choices (e.g., being overweight, having poor eating habits and a sedentary lifestyle) are reported by women with gestational diabetes [46], again reflecting the self-stigmatization of the condition. In addition, women report feeling controlled, monitored, and pressured when blood glucose levels fluctuate or are elevated (e.g., others commenting on the weight of the baby or the mother's eating habits) [45], which in turn can result in feelings of inadequacy, shame, and guilt. The controlling behaviors of others (e.g., family, friends, health professionals) may result from concerns about the health of the pregnant woman and her baby, but it is also possible that they may be motivated by feelings of blame towards the pregnant woman for placing herself and her fetus at risk.

5 Consequences of Diabetes-Related Stigma

The psychological impact of living with a stigmatized condition is significant, and may be a barrier to optimal self-care. Consequently, health-related stigma has the potential to impact negatively not only the psychological health but also the physical health of people living with stigmatized chronic conditions. This section focusses on the consequences of stigma for people living with diabetes. There are likely to be other consequences for people who do not have diabetes who hold stigmatizing beliefs and attitudes towards people with diabetes, however here we focus only on the impact of stigma on the lives of people living with diabetes.

Several studies found that people living with a stigmatized health condition reported experiencing depression and other psychological distress [47–49]. As a result of experienced or expected negative appraisal, people with diabetes may attempt to conceal their condition from others, leading to constant anxiety [36]. Concealment attempts include avoiding social activities, injecting insulin only in public toilets or at home (and thus delaying or omitting injections), or not performing regular self-monitoring of blood glucose [36]. Other examples include making unhealthy food choices due to reluctance to decline what is on offer, or not wanting to draw attention to oneself [35, 40]. Concealment attempts due to fear of negative appraisal compromise the self-care that is essential for people with diabetes, leading to sub-optimal blood glucose levels, and possibly short- and long-term diabetes complications (e.g., vascular disease). This indicates that concealment due to fear of negative appraisal can result in sub-optimal self-care and consequently in impaired physical health. Other evidence also suggests feelings of embarrassment when having to undergo diabetes self-management tasks in public, perhaps making it less likely that an optimal self-management routine is maintained [50].

Fear of negative appraisal or judgment can also contribute to a reluctance to share openly with close family, friends, and health professionals about self-management activities, blood glucose levels, or other health outcomes. People with diabetes may fear receiving negative feedback if they do not maintain optimal blood glucose levels, for which they are often held responsible when, in reality, many factors affecting blood glucose levels (e.g., stress, hormones, other medications) are beyond the person's influence. In one study, people with diabetes describe a culture of surveillance, and report using strategies to maintain an image of being "in control" (e.g., manipulating blood glucose diaries) to avoid being judged by significant others and health professionals [37].

Evidence from a systematic review [13] indicates that doctors, nurses, dieticians, and medical students hold stigmatizing attitudes towards people who are overweight and obese. This stigmatization of obesity by health professionals may act as a deterrent to engaging in healthcare, which has potential consequences for physical health and well-being. Up to half of overweight or obese patients reported that they had been humiliated by, or received derogatory comments from, health professionals [51]. This may result in a reluctance to be screened for diabetes in order to avoid the shame associated with failing to prevent the condition. Obese people are less likely than others to participate in breast, cervical, and colorectal cancer screening, and cite weight bias amongst health professionals as one of the reasons for this [13]. Many people with type 2 diabetes are also burdened by the compounding stigma associated with obesity [52].

6 Causes of Diabetes-Related Stigma

A holistic understanding of diabetes-related stigma requires that we attend not only to the perceptions and experiences of stigma but also to the causes of stigma, so that potential mitigating strategies can be identified. Attitudes of *blame* and feelings of *fear* and *disgust* are contributing factors to health-related stigma, and diabetes-related stigma specifically. Literature relevant to each of these concepts is reviewed in turn below. Previously, three functions of stigma have been identified: exploitation and domination, enforcement of social norms, and avoidance of disease [53]. We consider that, of these, enforcement of social norms and disease avoidance are relevant to diabetes-related stigma and may be considered causes of this stigma.

6.1 Blame

There is a culture of blame surrounding overweight and obesity [51], a phenomenon that can reasonably be generalized to type 2 diabetes. Given it is widely known that many cases of type 2 diabetes can be prevented, it logically follows that people with diabetes may perceive the general public to blame them for self-inflicting the condition, and this may lead to self-blame and lower perceived self-worth. Some have reported experiencing discrimination due to the perception that they unfairly utilize and drain societal resources [36], and are somehow less worthy of help than other 'more legitimate' medical conditions. Blame for self-infliction of the condition may also affect those with type 1 diabetes by association (particularly as media reports rarely make any attempt to distinguish the two conditions). Research in hepatitis C suggests that the association with intravenous drug use is so pervasive and persistent that people infected with the virus by other means experience stigma by association [54], and that they try to distance themselves from those who were infected as a result of illicit drug use [48]. Health promotion campaigns and other health-related media have been identified as causes of blame-induced stigma by people with hepatitis C [48] and those who are overweight/obese [55]. Health promotion initiatives with a sole or predominant emphasis on individual behavior as the causal factor in developing a chronic condition (whether it be hepatitis C, obesity, or type 2 diabetes) may facilitate or reinforce attitudes of blame directed at people with the condition [55].

6.2 Fear

Most people with type 1 diabetes and an increasing number of people with type 2 diabetes manage their condition using multiple daily insulin injections, and are therefore susceptible to being associated with the negative social appraisal of needle use. Vials and syringes carry a strong negative connotation and are often linked to illicit drug use or severe illness [32]. People with diabetes report receiving unwanted attention when injecting in public, and worry about being mistaken for illicit drug users [36, 37].

People with diabetes may display other conspicuous behaviors beyond their personal control during episodes of hypoglycemia (or low blood glucose levels). Hypoglycemic symptoms include altered mood and cognition (e.g., irritability, confusion), motor deficits, shakiness, sweating, vomiting, and, in severe cases, seizure. This pattern of symptoms and behavior can resemble being under the influence of alcohol [37], having a mental illness, or having epilepsy. People with epilepsy are commonly characterized as having intellectual impairments, and as being frail, antisocial, hostile and potentially violent, slow, and physically unappealing [56]. Fear of diabetes, then, may arise from feelings of uncertainty and helplessness.

6.3 Disgust

The role of disgust as an emotional reaction has been given increasing attention, particularly in the clinical and social literature, in recent years [57]. A small amount of evidence suggests that disgust may be a cause of health-related stigma [58]. Increased disgust sensitivity (reactivity to stimuli that elicit feelings of disgust) is associated with more negative attitudes towards obese people [59], a bias that is likely to impact many people with type 2 diabetes, and contribute to self-stigmatization. Feelings of disgust may also drive negative attitudes towards people with diabetes injecting or checking their blood glucose levels in public.

6.4 Enforcement of Social Norms

Enforcement of social norms is particularly relevant to observable behaviors or characteristics that are within one's personal control. As such, this is particularly relevant for type 2 diabetes co-morbid with overweight or obesity. While the prevalence of obesity is high in Western societies, the character judgments associated with overweight and obesity (e.g. lazy, no self-control, greedy [60]) may be considered deviations from the social norm. Pressure to meet the social norm may drive the development of self-stigmatization, and serve to justify the perspective of those holding stigmatizing attitudes as it may reinforce ingroup/outgroup comparisons.

6.5 Avoidance of Disease

From an evolutionary perspective, avoidance of disease is important for survival. Illness can be associated with physical changes (e.g., obesity), which may in turn serve to identify the person as being 'unhealthy' [61]. Motivation to avoid such persons may not serve any current function (as most people would understand that diabetes and its related conditions are not contagious), but instead may be rooted in an evolutionary drive to maintain good health, for oneself and on behalf of one's offspring (e.g., the case of not wanting to start a family with someone who may have a genetic predisposition to 'illness').

7 Mitigating Strategies

We were unable to identify any literature regarding strategies to reduce, or assist people to cope with, diabetes-related stigma. However, the literature about health-related stigma in general suggests that stigma-reducing interventions and mitigating strategies can be targeted at [23, 62]:

1. The health problem itself, using strategies such as public health initiatives to promote early detection and management
2. The sources of stigma, or people reinforcing the stigma, using strategies such as education, protest, and social marketing
3. The stigmatized person/group, aiming to reduce the emotional impact of stigma through counseling, peer support groups, and therapeutic communities
4. Social policy, using strategies such as advocacy, lobbying, and legislation, or research support

Some (albeit limited) evidence speaks to the effectiveness of some of these strategies. Persky and Eccleston [63] examined medical students' interactions with and attitudes towards an obese patient after reading about either behavioral or genetic mechanisms of obesity, or a control topic. Compared with both the control condition and the behavioral condition groups, students who read about genetic mechanisms held the patient significantly less responsible for their unhealthy weight. Students in the genetic group recommended weight loss, exercise, and dietary consultations less frequently than those in the control condition group [63], suggesting that the provision of genetic causal information may produce or reinforce fatalistic notions about the development of obesity.

There is some evidence from both HIV/AIDS [64] and epilepsy [56] research that improved knowledge about the condition is associated with less stigmatization. However, results of educational intervention evaluations are mixed [6, 13], possibly because stereotypes are resilient to change [62]. Increasing the level of personal contact between those living with stigmatized conditions and the general public may have educative effects and, because of the potential of this strategy to also demystify the condition, generate empathy, and reduce prejudice and negative stereotyping [65], this approach may be more effective in reducing stigma than information provision alone. Further research about the impact of personal acquaintance on social stigma is necessary. The case has previously been made for more research attention to be directed to health-related stigma intervention research [23].

8 A Framework for Understanding Diabetes-Related Stigma

Stigma is a universal phenomenon, which is associated with a number of medical conditions, including diabetes. With diabetes increasing at epidemic proportions worldwide [2], an increasing number of people are likely to be impacted by the negative social appraisals associated with diabetes (in all its forms). Thus, systematic research into diabetes-related stigma is an urgent priority. We propose a framework for understanding and investigating diabetes-related stigma, which is intended to illuminate the causes, experiences, and consequences of stigma. The framework is summarized in Fig. 1. Based on the evidence outlined in this narrative review, we propose that certain features of diabetes and its management, as well as the attitudes and beliefs of individuals and communities, contribute to the development of negative stereotypes about people with diabetes. The psychosocial mechanisms that cause stigma include blame, fear, and disgust, and the perceived need to enforce social norms and avoid disease. The self-perceptions of stigma, stereotypes (from self or others), and the stigmatizing practices that are common in society result in identity threat, as described by Major and O'Brien [19]. Stigma has a number of consequences for people with diabetes, including impaired psychological well-being and concealment attempts resulting in a compromised self-care regimen, which in turn leads to sub-optimal clinical outcomes. Dual strategies are needed to reduce diabetes-related stigma (e.g., via health promotion and education) and support people with diabetes to enhance coping and resilience (e.g., via peer support).

Future research into each aspect of the proposed framework will serve to build on our understanding of the experience of diabetes-related stigma. A key priority for future research in this area is to develop a standardized self-report tool to assess perceived, experienced, and internalized diabetes-related stigma. While some generalized measures of health-related stigma do exist [66, 67], they are interview based (and therefore resource intensive to administer), and do not encompass all relevant aspects of diabetes-related stigma as outlined in this review. Previous attempts have been made to adapt condition-specific self-report stigma measures (e.g., the HIV Stigma Scale adapted for people at risk of diabetes [29]). However, this too is problematic as the stigma constructs assessed are not completely consistent with what is indicated by the diabetes-related literature and may underestimate diabetes-related stigma. Detailed qualitative studies with people with diabetes are required to explore perceptions, experiences, and domains of stigma specific to diabetes (paying attention to the different types of diabetes), which can then be used to inform scale development. This will then enable quantitative studies to be conducted to explore and assess the perceptions of people with diabetes, and measure change over time or in response to interventions to reduce stigma.

9 Limitations

The synthesization of these research findings is limited by the few studies identified and the lack of a standardized

measure of diabetes-related stigma, meaning that the conceptualization and operationalization of the concept of stigma differs between studies. Consistency in definitions and standardization of measurement in quantitative studies will be crucial for the advancement of research in this area.

10 Conclusion

Current evidence generally reflects the notion that people with diabetes perceive significant social stigma associated with their condition, though this is not consciously corroborated by people without diabetes. Although participants with diabetes in one study indicated that they felt that the stigmatization was diminishing [37], it remains a significant issue faced by people with type 1 and type 2 diabetes, and anecdotal evidence indicates perceived stigma may be increasing. This stigmatization has a significant impact on psychological well-being and results in sub-optimal self-care, which can lead to poorer clinical outcomes. Diabetes-related stigma is driven by attitudes of blame and feelings of fear and disgust, possibly on behalf of both people with and people without diabetes, as well as the felt need to enforce social norms and avoid disease. Well-intentioned health promotion initiatives may have unintended consequences, reinforcing these negative appraisals.

By drawing on the evidence about health-related stigma in diabetes and other chronic conditions, we have developed a framework for understanding diabetes-related stigma that describes the causes and consequences, and also identifies some potential mitigating strategies. This framework is intended to inspire and guide systematic research to improve understanding of diabetes-related stigma and to mitigate this negative phenomenon in diabetes.

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