

Obesity Stigma in Online News: A Visual Content Analysis

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This study conducted a content analysis to examine the types of images that accompany online news stories about obesity and to determine how obese people are portrayed in news photographs. Images were selected from news articles about obesity obtained from 5 major news Web sites, during a 2-week period in September of 2009. Images accompanying news stories about obesity (N = 549) were systematically coded. Of 441 individuals identified in news photographs, 65% were overweight/obese and 27% were nonoverweight. Overall, 72% of images that depicted an overweight or obese person were portrayed in a negative, stigmatizing manner. Overweight/obese individuals were significantly more likely to have their heads cut out of the photos, to be portrayed showing only their abdomens or lower bodies, and to be shown eating or drinking than were nonoverweight individuals. Overweight/obese individuals were significantly less likely to be shown fully clothed, wearing professional clothing, or exercising than were nonoverweight individuals. Obese individuals are frequently stigmatized in online news photographs; this phenomenon has important implications for public perceptions of obese persons and may reinforce pervasive prejudice and discrimination.

As obesity presents a major public health challenge, stigma against obese individuals threatens to undermine efforts to confront this challenge (Puhl & Heuer, 2010). Obese people are highly stigmatized in our society in important domains of living, including education, employment, and health care (Puhl & Brownell, 2001; Puhl & Heuer, 2009). The mass media is an especially compelling example of the social acceptability of weight stigma. Weight stigmatization is common in several forms of popular media (Puhl & Heuer, 2009). Overweight and obese persons are frequently ridiculed and stereotyped in popular television shows and movies (Fouts

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& Burggraf, 1999, 2000; Fouts & Vaughan, 2002; Greenberg, Eastin, Hofshire, Lachlan, & Brownell, 2003; Herbozo, Tantleff-Dunn, Gokee-Larose, & Thompson, 2004; Himes & Thompson, 2007; Klein & Shiffman, 2005, 2006; Robinson, Callister, & Jankoski, 2008), and the news media often takes a victim-blaming approach in their coverage of obesity (Boero, 2007; Bonfiglioli, Smith, King, Chapman, & Holding, 2007; Kim & Willis, 2007; Lawrence, 2004; Rich & Evans, 2005).

Research demonstrates that the news media disproportionately frames obesity in terms of personal responsibility, focusing on individual-level causes and solutions while ignoring important societal and environmental contributors (Bonfiglioli et al., 2007; Kim & Willis, 2007; Lawrence, 2004). As the news media tends to cast blame on obese persons, weight stigmatization can be perpetuated (Crandall & Reser, 2005; Weiner, Perry, & Magnusson, 1988). To date, research in this area has primarily analyzed written content of news reports about obesity. However, weight stigma may also be conveyed through visual content, such as photographs that accompany news articles. Negative or stereotypical portrayals of obese people in news photographs can communicate biases to viewers, independent of the written content of the article. For example, photos that depict obese persons engaging in stereotypical activities (e.g., eating junk food), or photos that place unnecessary emphasis on excess weight and isolate obese persons' body parts (e.g., abdomens, buttocks) can be stigmatizing and perpetuate negative attitudes. A recent experimental study randomly assigned participants to view a news story about the prevalence of obesity (neutral in tone and content) that was paired with either stereotypical, unflattering photographs of obese persons or nonstereotypical, flattering photographs. Participants who were presented with the negative portrayals of obese persons subsequently expressed higher level of weight bias, compared with those who were presented with the positive portrayals (McClure, Puhl, & Heuer, 2011). The implications of these findings are important, especially if images of obese people in the news are often negative.

Visual content analyses have been used to assess the nature of visual content in the media and, more specifically, to examine the presence of stereotypes and determine their effects on viewers' understanding of social issues. These studies are guided by Goffman's (1974) frame analysis theory, which provides the theoretical foundation for the stereotyping process. Framing theory explains the process by which a source (e.g., a news story) defines a particular social issue and outlines the fundamental problems and considerations relevant to that issue (Nelson, Oxley, & Clawson, 1997). Framing theory has often been used in media studies as a basis for studying how a communication source (e.g., a news organization) constructs social or political problems (Nelson et al., 1997). Visual framing, or pictorial framing, of an issue is also of particular importance because viewers tend to accept visual images as reality while being unaware of the influence of visual framing (Messaris & Abraham, 2001). According to Messaris and Abraham, "Pictorial framing is worthy of investigation not only because images are capable of conveying un verbalized meanings, but also because awareness of those meanings may be particularly elusive." Furthermore, news photos may be noticed even when the accompanying story is not read, and photographs help readers interpret news stories (Messaris & Abraham). Studies guided by framing theory have used visual content analysis techniques and demonstrated that news photographs can communicate stereotypes (Fahmy, 2004) and racial, gender, and age biases (Entman, 1992; Martindale, 1990; Rodgers & Thorson, 2000).

To our knowledge, no study has investigated the ways in which obese individuals are visually depicted in the news. Thus, this study aimed to conduct a content analysis to examine the types of images that accompany online news stories about obesity and to determine how obese people are portrayed in news photographs.

Methods

Sample

We selected photographs by searching five major news Web sites for articles about obesity: MSNBC.com, CNN.com, ABCnews.com, CBSnews.com, and FOXnews.com. We also considered Web sites of major online newspapers (e.g., NYTimes.com, WashingtonPost.com), but subsequently excluded them because we discovered that these sites often did not include images with their archived news stories. In addition, recent research reveals that the majority of Americans are more likely to get their news from online sources, as opposed to print sources (Pew Research Center Publications, 2009). Therefore, we chose to analyze photographs that were featured with online news articles in order to obtain a sample of images that may have a high level of exposure to a greater number of viewers. After testing several search terms (e.g., *fat*, *obese*, *weight*, *overweight*) and examining the types of articles produced by each Web site, we determined that the search term *obesity* produced the most news articles relevant to this study. After typing *obesity* into the search box of each Web site, thousands of results were produced, which were automatically sorted by each Web site according to their relevance to the topic of obesity. We conducted searches on each of the five Web sites during a 2-week period in September of 2009.

Because the goal of the present study was to examine visual images accompanying articles about obesity, every article produced by our search results was screened to determine whether the primary topic (or a major topic) of the article was about obesity. For some articles, the word *obesity* appeared in the headline, but for many articles *obesity* was prominently discussed in the text of the article. Thus, each article was read by coders in order to determine whether the main focus of the article was obesity. Articles were selected for inclusion in the content analysis if they met the following criteria:

1. The main topic or a major topic in the article was obesity (e.g., health care spending on obesity, obesity treatment, health consequences of obesity).
2. The article was accompanied by an image.

Because of the high volume of articles produced by each Web site search (e.g., 78,200 articles about obesity were retrieved on MSNBC.com), only the first 500 results on each Web site were included as potential sources of images for this study. After reviewing the first 500 results on each Web site, exclusions were made if the online report was not accompanied by an image or photograph (which was the primary reason for exclusion), and if after reading the article it became apparent that obesity was not a primary focus of the content. Using this exclusion process, 549 images were ultimately retrieved to be included in the content analysis (70 images from MSNBC.com, 267 images from CBSnews.com, 119 images from ABCnews.com, 65 images from CNN.com, and 28 images from FOXnews.com).

Measurement

The unit of analysis in this study was individual images accompanying news stories about obesity ($N = 549$). To conduct a content analysis, a comprehensive coding tool was developed with specific variables that were chosen to document demographic characteristics and describe the portrayals of obese persons in the photographs. Variables were also chosen to capture ways in which images may be stigmatizing or stereotypical. Variables included the following:

1. News source of the image
2. Date the article was published
3. Story topic
4. Image credit (Associated Press, a stock image, or credited to the news source itself)
5. Demographic characteristics of the person in the image (gender, age, and race)
6. Body weight (underweight, normal weight, overweight, obese, very obese, or pregnant)
7. How the body was portrayed in the image (most of the body, head/face, abdomen, or lower body)
8. Whether the head was cut out of the image
9. Whether the person in the image was clothed (fully clothed, partially clothed, or mostly unclothed)
10. Clothing style (professional, casual, or exercise)
11. Fit of clothes (appropriate or inappropriate; coded as inappropriate only if an obese individual's clothing was distinctly too tight)

Images were also coded according to the main role or activity of the person(s) portrayed in the image. These included the following:

1. Eating and/or drinking
2. Selling, shopping for, serving, and/or cooking food
3. Exercising
4. Being an expert, researcher, advocate, or journalist
5. Being a patient
6. Being a health professional
7. Being the feature of a weight loss success story
8. Being shown as an isolated body part (e.g., only the abdomen is shown)
9. Walking down the street
10. Engaging in sedentary behavior (e.g., watching television, playing a video game)
11. Being featured in a personal interest story (e.g., a photograph of a couple who were denied adoption because of their obesity)
12. Other activities

If there was food or drink present in the photograph, it was coded as either healthy (e.g., fruit, vegetables, water) or unhealthy (e.g., potato chips, fast food, soda).

All images were systematically coded by a team of four trained coders. We assessed interrater reliability by having each of the four coders independently code 25% of articles in the sample ($n = 137$). Because the coded variables were nominal, we calculated reliability using Cohen's kappa for multiple raters. This calculation corrected for chance agreement among coders. Reliability scores in this study ranged

from 0.72 (lowest) to 1.0 (highest), which indicates a high level of agreement among all four coders. The lowest score was for the variable assessing the story topic of the news article. Before coding the remaining 75% of the articles, all four coders arbitrated in order to resolve any outstanding coding inconsistencies.

Results

Sample Characteristics

Of the total sample of 549 images, 120 (22%) were excluded from analysis because they did not contain people (these were mostly images of food or other health-related graphics). This exclusion left 429 images published in online news articles about obesity from 2002 to 2009. Among these articles, 15 different categories of story topics were identified. The most prevalent story topics were about the health consequences of obesity (13%), community or government initiatives to prevent obesity (10%), obesity prevalence (9%), and weight loss surgery or drugs (9%). The majority of the images accompanying these reports were credited to the Associated Press (54%).

When more than one person was depicted in an image, each person was coded separately, resulting in 441 individual people in the final sample. Table 1 shows the demographic characteristics of individuals in our sample. Overall, 56% of the sample was male, and 44% was female. The majority of individuals were White (79%), and 18% were racial/ethnic minorities (e.g., Black, Latino, Asian). In addition, 70% were adults and 29% were youths. Sixty-five percent of the sample was overweight/obese, and 27% were nonoverweight. The original weight categories of “overweight,” “obese,” and “very obese” were collapsed into one “overweight/obese” category, because of relatively small percentages of individuals who were coded as “overweight” or “very obese.” The remaining 8% were either pregnant or their weight category could not be determined; thus, they were subsequently excluded from further analysis. All subsequent analyses compare nonoverweight with overweight/obese persons.

Portrayals of Overweight/Obese Persons

Table 2 compares the percentage of overweight/obese persons versus nonoverweight persons who were portrayed with specific characteristics of interest. We performed chi-square tests to determine significant differences between portrayals of overweight/obese people and nonoverweight people. In addition, we calculated odds ratios to maximize the interpretability of the chi-square results. Although there were no differences in gender or race among overweight/obese persons versus nonoverweight persons, several other significant findings emerged. Youths depicted in images were twice as likely to be overweight/obese than were adults who were portrayed in images, $\chi^2(1, N = 400) = 6.75, p = .009$.

There were several significant differences in how individuals' bodies were portrayed in the photographs. More than half of overweight/obese people (52%) were portrayed in images with only their abdomens or lower bodies shown, whereas nonoverweight people were never portrayed in this way, $\chi^2(1, N = 404) = 98.44, p < .001$. Overweight/obese individuals were 23.3 times more likely to have their heads cut out of the photos than were nonoverweight individuals, $\chi^2(1, N = 404) = 97.16, p < .001$.

Table 1. Demographic characteristics of individuals portrayed in online news images ($N = 441$)

Online news source						
Variable	MSNBC (N = 70)	CBS (N = 202)	ABC (N = 103)	CNN (N = 42)	FOX (N = 24)	Total Sample (N = 441)
<i>Weight</i>						
Nonoverweight	39%	19%	24%	45%	33%	27%
Overweight/ Obese	61%	71%	71%	45%	33%	65%
Could not be determined	0%	8%	4%	10%	29%	7%
<i>Sex</i>						
Male	69%	55%	47%	61%	54%	56%
Female	31%	45%	52%	39%	46%	44%
Could not be determined	0%	1%	2%	2%	0%	1%
<i>Age</i>						
Youth	30%	34%	26%	19%	8%	29%
Adult	69%	65%	73%	76%	92%	70%
Could not be determined	1%	1%	1%	5%	0%	1%
<i>Race</i>						
White	79%	89%	62%	69%	75%	79%
Black	10%	5%	12%	7%	4%	7%
Latino	11%	2%	18%	7%	0%	8%
Asian	0%	1%	2%	12%	13%	3%
Could not be determined	0%	3%	6%	5%	8%	3%

Overweight/obese individuals were also more likely to be photographed from the side and rear view (rather than from the front) than nonoverweight individuals, odds ratio = 2.61, $\chi^2(1, N = 403) = 14.26$, $p < .001$. Overweight/obese people were less likely to be appear fully clothed, odds ratio = 0.32, $\chi^2(1, N = 400) = 5.73$, $p = .02$, and were less likely to appear in professional clothing compared with nonoverweight persons, odds ratio = 0.13, $\chi^2(1, N = 370) = 65.80$, $p < .001$.

Overweight/obese and nonoverweight persons also differed in the types of activities in which they were portrayed in photographs. Overweight/obese individuals were 3.5 times more likely to be shown consuming food compared with nonoverweight persons, $\chi^2(1, N = 404) = 4.66$, $p = .03$. Conversely, nonoverweight individuals were 3.9 times more likely to be shown exercising compared with overweight/obese individuals $\chi^2(1, N = 404) = 16.91$, $p < .001$. Nonoverweight individuals were 50 times more likely to be shown as experts, advocates, or journalists than were overweight/obese individuals, $\chi^2(1, N = 404) = 90.99$, $p < .001$, and were also more likely than overweight/obese persons to be shown as healthcare providers, odds ratio = 7.69, $\chi^2(1, N = 404) = 34.95$, $p < .001$. There were no significant

Table 2. Comparison of portrayals for overweight/obese persons versus nonoverweight persons in online news reports about obesity

	Overweight/obese (N = 287)	Nonoverweight (N = 119)
<i>Negative characteristic</i>		
“Headless”	59%	6%
Shown from side or rear angle	40%	20%
Only abdomen or lower body shown	52%	0%
Shown without clothes or bare midriff	12%	4%
Inappropriate fitting clothing	6%	0%
Shown eating and/or drinking	8%	3%
Engaged in sedentary activity	5%	3%
<i>Positive characteristic</i>		
Wearing professional clothing	11%	50%
Shown exercising	6%	20%
Portrayed as expert or advocate	1%	33%
Portrayed as health care provider	4%	22%

differences for being shown in the role of a patient or engaging in sedentary behaviors between overweight/obese and nonoverweight persons.

Characteristics of Individual News Source

Because the sample included images from five distinct news sources, we conducted analyses to determine whether significant differences emerged between each news source for demographic characteristics. The Breslow-Day Test determined whether there was homogeneity in the odds ratio between news sources, with the criterion for significance set with an alpha of .10. First, analyses revealed that there were differences between the news sources regarding gender and weight: Breslow-Day $\chi^2(4) = 16.55$, $p = .002$. Specifically, within CBSnews.com, men were 4.2 times more likely to be overweight/obese than were women, $\chi^2(1, N = 182) = 14.74$, $p < .001$. There were no significant differences for gender among the other news sources. Second, there were also differences between sources for weight and age of images portrayed: Breslow-Day $\chi^2(4) = 8.03$, $p = .09$. Specifically, within CBSnews.com, the odds of a youth being overweight/obese were 3.6 times greater than the odds of adults being overweight/obese, $\chi^2(1, N = 181) = 7.86$, $p = .005$. There were no significant differences for age among the other sources.

Stigmatizing Portrayals

Images were also analyzed to determine whether the portrayals of overweight/obese individuals were stigmatizing. An image was considered stigmatizing if it met one or more of the following criteria:

1. Disproportionately emphasized an overweight/obese person's abdomen or lower body
2. Portrayed an overweight/obese person's abdomen without clothes
3. Featured an overweight/obese person with their head cut out of the image

4. Portrayed an overweight/obese person with inappropriately fitting clothing (e.g., a shirt that is distinctly too tight)
5. Portrayed an overweight/obese person eating/drinking an unhealthy food/drink
6. Portrayed an overweight/obese person engaging in a sedentary activity

Overall, 72% of images that portrayed an overweight or obese person met at least one of the aforementioned criteria. Overweight/obese men were slightly more likely than overweight/obese women to be portrayed in a stigmatizing way, odds ratio = 1.6, $\chi^2(1, N = 437) = 5.95, p = .02$. In addition, overweight/obese White individuals were twice as likely to be portrayed in stigmatizing ways than overweight/obese minorities, $\chi^2(1, N = 426) = 7.85, p = .005$. There were no significant differences by age.

Among all the images in the sample for each news source, CBSnews.com had the highest percentage of stigmatizing images (43%), followed by ABCnews.com (35%), MSNBC.com (26%), CNN.com (19%), and FOXnews.com (18%). Among photos credited to the Associated Press, 46% were stigmatizing. Among the stock photos, 33% were stigmatizing, and 19% of images that were credited to the individual news sources were stigmatizing. Last, news stories about the genetic causes of obesity contained the highest percentage of stigmatizing images (70%), followed by health care spending (63%), and prevalence of obesity (58%). The lowest percentages of stigmatizing images were paired with stories on food/diet (5%) and exercise (8%). There were no significant differences in stigmatizing portrayals by the year of an article's publication.

Discussion

This study demonstrates that the majority (72%) of overweight and obese individuals depicted in online news photographs were stigmatized. Overweight and obese individuals were more likely to have their heads cut out of photos, to be shown from the side or the rear, to be portrayed with only their abdomens or lower bodies shown, and to be partially clothed (e.g., bare stomachs showing) than non-overweight individuals.

These findings confirm the phenomenon of the “headless stomach,” which is the tendency for news reports to show obese people with their heads cut out of images. This phenomenon has been fervently discussed by writers in online communities (Cooper, 2007), but it has never been empirically studied. Some may argue that obese individuals' heads and faces are omitted from news photos to protect their privacy. However, images that place unnecessary emphasis on particular body parts seem to intentionally evoke a sense of disgust, rather than merely portray a obese person with their identity concealed. This is especially apparent when news articles are accompanied by stock images that show unclothed obese people (e.g., with no shirt). By isolating certain body parts and emphasizing unflattering portrayals of excess weight, news photographs degrade and dehumanize obese individuals. Consequently, obese people are reduced to being symbols of the epidemic, rather than valued members of society who deserve compassion and respect.

In addition to the abundance of negative images of overweight individuals observed in the present study, there was also a considerable lack of positive portrayals. Overweight and obese individuals were less likely to be shown wearing professional-looking clothing, and were far less likely to be portrayed as experts,

advocates, journalists, or healthcare providers than those who were not overweight. In addition, overweight persons were less likely to be shown exercising and more likely to be portrayed eating or drinking than were nonoverweight persons. Such portrayals perpetuate negative weight-based stereotypes about obese persons.

Millions of Americans rely on the Internet for their news (Pew Research Center Publications, 2009). Thus, the number of Americans who are exposed to these stigmatizing portrayals of obese persons is vast, which may affect the pervasive stigma and discrimination directed toward obese individuals. Experimental research shows that people who read a news story about obesity that is paired with a stigmatizing photograph subsequently express higher levels of weight bias than do those who read the same news story about obesity paired with a nonstigmatizing photograph (McClure et al., 2011). As these negative images of obese people have become commonplace, they help to shape societal beliefs about obese persons.

In addition to perpetuating societal stigma, negative news images of obese persons may also contribute to the physical and emotional health consequences suffered by persons who experience weight stigma. An accumulation of research demonstrates that obesity stigma poses a significant threat to psychological and physical health, including increasing vulnerability for depression, anxiety, low self-esteem, disordered eating, lower levels of physical activity, and weight gain (Ashmore, Friedman, Rechmann, & Musante, 2008; Carels et al., 2009; Puhl & Brownell, 2006; Puhl & Heuer, 2009; Puhl, Moss-Racusin, & Schwartz, 2007; Vartanian, Herman, & Polivy, 2005; Vartanian & Shaprow, 2008). Obese individuals who view these stigmatizing images in the news may be vulnerable to internalizing negative weight-based stereotypes, which can, in turn, lead to emotional and physical health consequences (Puhl et al., 2007). Considering both the pervasiveness of negative visual content in the news, and the prevalence of overweight and obesity in American children and adults, the public health impact of these stigmatizing portrayals may be substantial.

Some critics may argue that the use of “positive” (e.g., nonstigmatizing) images of obese persons could potentially normalize obesity in a way that reduces motivation to maintain a healthy weight. However, scientific evidence suggests that weight stigma is not a beneficial tool for motivating weight loss. Weight stigma is counterproductive for public health and increases the likelihood for unhealthy eating behaviors, avoidance of physical activity, impaired weight loss efforts, and decreased use of preventive health services (Amy, Aalborg, Lyons, & Keranen, 2006; Ashmore et al., 2008; Carels et al., 2009; Puhl & Brownell, 2006; Puhl & Heuer, 2010). In contrast, studies suggest that communicating acceptance and providing support, rather than instilling stigma and shame, are more appropriate and effective strategies to promote healthy lifestyle behaviors in obese persons (Lillis, Hayes, Bunting, & Masuda, 2009).

The present findings also have potential implications for public health policy. The news media have tremendous power to shape the public’s perception of social issues, and, in doing so, can influence the agenda of policymakers (McCombs & Shaw, 1972). To the extent that news images stigmatize obese individuals, they reinforce blame on obese persons (Crandall & Reser, 2005). The media’s attribution of obesity as a problem with obese individuals themselves (rather than a more complex societal and public health issue) is underscored by the inclusion of stigmatizing images. When obese individuals are blamed, the need for government involvement and public policy efforts to address obesity is curtailed. Thus, negative visual

framing of obese persons in the news could adversely influence public policy efforts to address obesity.

At the same time, the news media can play an important role in reducing societal stigma toward obese individuals by changing the visual content of their news reports about obesity. It is not uncommon for media outlets to establish ethical guidelines that advise journalists against stereotyping and bias. For example, the Society of Professional Journalists' Code of Ethics states, "Journalists should avoid stereotyping by race, gender, age, religion, ethnicity, geography, sexual orientation, disability, physical appearance or social status" (Society of Professional Journalists, 2010). The Code of Ethics for the National Press Photographers Association states that visual journalists should "avoid stereotyping individuals and groups" (National Press Photographers Association, 2010). Therefore, it is reasonable to expect the news media to make a concerted effort to correct bias in their visual content when it is exposed.

In the present study, more than half of images were credited to the Associated Press, and 46% of these images were found to be stigmatizing. According to the Associated Press Statement of News Values and Principles, "Always and in all media, we insist on the highest standards of integrity and ethical behavior when we gather and deliver the news That means we abhor inaccuracies, carelessness, bias or distortions" (Associated Press, 2010). Thus, in keeping with their stated values and standards, it would be consistent and appropriate for the Associated Press to improve their photographic depictions of obese individuals, as should other mainstream online news outlets.

There are several limitations of the present study. First, the sample consisted of Web-based news reports and therefore it is unknown whether images that accompany print articles (e.g., newspapers, magazines) about obesity differ from images used in online news. Additional research is needed to establish the generalizability of these findings to other media sources. Second, it would be useful to obtain larger and more diverse samples of images from online news sources to more closely examine potential differences in portrayals of obese persons related to issues of race, age, sexual orientation, and other characteristics that were beyond the scope of this study. Last, the sample of images selected for this study focused on online news coverage of obesity-related topics. It would be informative for future research to examine whether portrayals of obese and nonobese persons documented in the present study are similar in news stories on topics unrelated to body weight.

Obesity stigma in the mass media contributes to the social acceptability of weight prejudice and its consequences for those who are affected (Puhl & Heuer, 2009). News images of obese persons may be a particularly powerful and insidious source of obesity stigma, especially given that these images are prevalent and rarely challenged. Our study revealed that the prevalence of stigmatizing images accompanying news stories about obesity remained consistent throughout a 7-year period from 2002 to 2009. As this problem persists, efforts are clearly needed to address the visual portrayals of obese persons in the media to help reduce stigma. Photographers, journalists, and editors must be mindful of the power of their photographic content to communicate biases to their readers. As a result of societal weight stigma, overweight individuals are vulnerable to serious health complications, and they face disadvantages in health care, employment, education, and beyond. Just as the news media have the power to perpetuate these disparities, they may also play a vital role in correcting them. Further research is needed to examine the effect of a shift toward

positive portrayals of obese individuals in obesity news on public attitudes and approaches to address obesity.

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