

Influence and effects of weight stigmatisation in media: A systematic

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Summary

Background The lack of a comprehensive understanding of the role of mass media in perpetuating weight stigma hinders policy formulation. We reviewed the influence of mass media on weight stigmatisation and the effectiveness of media-based interventions designed to prevent or reduce stigma.

Methods We conducted a systematic review across seven databases from inception to December 2021. Included studies assessed exposure to or impact of weight stigma in mass media or examined interventions to reduce stigma through media in populations 12+ years. We synthesised data narratively, categorising studies based on similarity in focus to produce a set of integrated findings. The systematic review is registered in PROSPERO (No. CRD42020176306).

Findings One-hundred-and-thirteen records were eligible for inclusion from 2402 identified; 95 examined the prevalence of stigmatising content in mass media and its impact on stigma. Weight stigma was prevalent across media types, with the dominant discourse viewing overweight and obesity as an individual responsibility and overlooking systemic factors. Exposure to stigmatising content was found to negatively influence attitudes towards people with overweight or obesity. Few studies considered methods of reducing stigma in the media, with only two testing media-based interventions; their results were promising but limited.

Interpretation Weight stigma in media content is prevalent and harmful, but there is little guidance on reducing it. Future research focus needs to shift from assessing prevalence and impacts to weight stigma interventions.

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Introduction

People with overweight or obesity frequently encounter weight stigma – discrimination towards people based on their weight and body shape and size.¹ Such stigma is known to cause psychological and physiological harms, including disordered eating, depression, and elevated stress levels.² It has therefore become a major focus of research and practice in public health.³ Mass media, including news, entertainment, advertising, and social media, play a crucial role in the dissemination of health information and shape understandings of and attitudes towards public health issues, including

weight.^{4–6} Exposure to weight biased media content, such as over-representing thin individuals, using weight-related humour, and spreading misinformation about causes of overweight and obesity, can reinforce negative attitudes.⁷ Public health mass media campaigns can also perpetuate stigmatisation and amplify the risks of unhealthy behaviours through the use of anti-fat rhetoric.^{7,8} Accordingly, the World Health Organization (WHO) and the subsequent joint consensus of 2020 World Obesity Day have called for research to identify and improve policies and legislation approaches to reduce weight stigma in mass media.^{1,7}

The lack of understanding of the role of mass media in supporting and sanctioning weight stigmatisation hinders public policy formulation and action to address the problem.^{9,10} In a systematic review focusing on

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Research in context

Evidence before this study

Previous research indicates that people with overweight and obesity frequently encounter weight stigma, including through mass media. However, how mass media might perpetuate or be used to combat weight stigma has not been comprehensively reviewed.

Added value of this study

To the best of our knowledge, this is the first dedicated review of the relationship between mass media and weight stigmatisation. The evidence we identified suggests that weight stigma is highly prevalent across a wide range of media and has a negative impact on attitudes towards people with overweight or obesity and the causes of overweight and obesity.

Implications of all evidence available

Policymakers, researchers, and those working in the development, implementation and/or evaluation of obesity-related campaigns should be aware that weight stigma is highly prevalent in media and it is harmful. While there is some guidance on producing content that minimises weight stigma, there is very little on specific media-based interventions for its prevention. More evaluations of media-based interventions are needed to inform prevention efforts, particularly ways to change the dominant discourse on media to one that recognises the complexity of overweight and obesity causation and the harmfulness of weight stigma.

social media, the authors highlight the adverse effects of stigmatisation on health within online communities.⁹ However, the specific content and mechanisms by which different mass communication platforms (e.g. television, print, social media) might perpetuate weight bias, negatively impact population attitudes and behaviours, and encourage stigmatisation are not well understood.^{1,7,9,10} A review of the evidence would facilitate action to reduce media generated weight stigma.

In this narrative systematic review, we aimed to summarise current evidence on 1) how mass media influences weight stigmatisation; and 2) the effectiveness of mass media interventions designed to prevent or reduce weight stigma.

Methods

Search strategy and selection criteria

Following PRISMA guidelines¹¹ and a registered protocol with PROSPERO (No. CRD42020176306), we systematically searched seven electronic databases (PubMed, CINAHL, Scopus, Medline, Embase, PsycInfo, and Cochrane Databases of Systematic Reviews)

from inception until 2 December 2021. We applied English search terms without restriction on language, study setting, study design, follow-up duration, or outcome measures (Supplementary 1). We considered studies eligible if: a) they were a published peer-reviewed journal article; b) the age of the stigmatised or sampled population included in the study was over 12 years; c) the authors defined exposure as stigmatisation/bias through mass media and/or included interventions to reduce stigmatisation/bias through mass media.

After removing duplicates, two reviewers independently screened each article for eligibility in a two-staged approach using Covidence (<https://www.covidence.org/>). The first stage comprised title/abstract screening. The second stage comprised a full-text review, with reviewers recording the reason(s) for exclusion. Disagreements were rare (84% agreement between reviewers) and resolved by referral to a third reviewer who independently reviewed the study. One article reviewed at the full text stage was in Spanish, for which we invited an external reviewer with proficiency in Spanish to perform the screening process. This article was excluded at the full-text stage.

Quality assessment and data extraction

Pairs of independent reviewers applied the Joanna Briggs Institute (JBI) critical appraisal instrument to assess methodological quality using the associated tools appropriate to quantitative, qualitative, mixed-method, and review studies across all included studies.¹² The two reviewers were then unblinded and resolved any disagreements through discussion or referral to a third reviewer (BB) where reviewers could not agree. Each study was then given a rating of high, moderate, or low quality, as described in the study protocol and in line with Pieper, Koensgen and colleagues.¹³ No studies were excluded based on quality.

One reviewer extracted data from each study using an a priori pilot-tested standardised data extraction form in Microsoft Excel. Data comprised: country, study purpose, study design, study population or participants, stigma sources type, sample size, setting, communication platform(s), intervention, outcome measures, and key findings. We conducted data verification on a random sample of the included studies.

We synthesised data according to the convergent integrated approach of the JBI methodology for mixed-methods systematic reviews.¹⁴ We categorised studies based on similarity in focus to produce a set of integrated findings. Specifically, we grouped studies that provided information on:

- The presence of weight stigma in all types of media content, including public health messages and campaigns (Research Question (RQ) 1),
- The impact of stigmatising media content on attitudes, beliefs, and perceptions about weight and

behaviours towards people with overweight or obesity, including self-directed stigmatisation (RQ1), and

- Addressing or reducing weight stigma through media (RQ2).

Meta-analysis was not appropriate due to the high heterogeneity amongst the included studies in terms of exposures, samples, study methodology and outcomes. Therefore, we present an integrated narrative summary of the results.

Role of the funding source

There was no funding source for this study.

Results

Our search identified 2402 potentially eligible studies, of which 113 were included in the review (Figure 1). Almost all ($n = 95$) of the included studies examined the presence and/or impact of weight stigma in media content, with the over half of those focusing on news media ($n = 35$) or entertainment ($n = 18$); Table 1 and Supplementary 2). Comparatively few studies examined social media ($n = 9$) or advertising ($n = 3$). Twenty-six studies provided insights into addressing or reducing weight stigma on or through mass media, with half relating to public health messages or campaigns ($n = 13$). Only four studies reported on mass media interventions specifically designed to address weight stigma.¹⁵⁻¹⁸

More than half of the included studies were from North America, with 65 from the USA^{6,16,18-80} and five from Canada.⁸¹⁻⁸⁵ The remainder were from Australia ($n = 16$),^{17,86-100} the UK ($n = 10$),^{15,101-109} Sweden ($n = 2$),^{110,111} New Zealand ($n = 2$),^{9,112} and one each from Israel,¹¹³ Norway,¹¹⁴ the Netherlands,¹¹⁵ Germany,¹¹⁶ Ireland,¹¹⁷ Malaysia,¹¹⁸ South Korea,¹¹⁹ and Dominica.¹²⁰ Five studies included a cross-national focus.^{7,121-124} Of the included studies, 48 were quantitative^{15-19,24,30-34,37,39-42,45,46,50,51,54-58,60,61,63-67,69,73,74,76,77,80,83,84,87,90,91,98,102,106,120,124} and 55 were qualitative.^{20,21,23,25,27-29,35,38,43,44,47-49,52,62,68,71,72,78,81,82,85,86,88,89,92-97,99-101,103-105,107-114,116-119,121-123} Of the remaining studies, nine were review articles^{6,9,26,36,53,59,75,79,115} and one was an expert consensus statement.⁷ Most studies were ranked as high quality ($n = 91$)^{7,15-21,23-25,27,29-31,33-40,42,44,47-52,54-74,76-82,84-90,92-99,102-107,109-111,113,114,117,118,120-123} and the remainder ($n = 22$) as moderate quality.^{6,9,22,26,28,32,41,43,45,46,53,75,83,91,100,101,108,112,115,116,119,124} For qualitative studies, the most common shortcomings related to consideration of the influence of the research on the researcher (and vice versa) and positioning the research culturally or theoretically. For quantitative studies, common weaknesses in the included studies were being unclear about the randomisation process

(for randomised trials) and whether the characteristics of participants in the different groups were similar at baseline. Reviews lacked sufficient detail about their inclusion/exclusion criteria and the screening and extraction process.

Presence of weight stigma in media content

Review papers and prevalence studies noted the presence of stigmatising content across a wide range of media.^{6,26,36,53,75,77} On the one hand, people with overweight or obesity were underrepresented in the media, compared to the prevalence of overweight and obesity in the general population.^{20,43,48} On the other, where people with overweight or obesity were included, it was typically in ways that could contribute to stigma.^{22,23,38,48,49,51,52,62,65,68,71,91,111,113,121,122} Backstrom²⁷ argued that the negative representation of overweight and obesity has a long history dating back to so-called “freak shows” and has not changed substantially in more recent times. Studies of imagery of people with overweight or obesity found that their bodies were frequently criticised, and depicted as headless, from behind, or in other unflattering ways, such as with negative facial expressions, poorly fitting clothes, eating unhealthy foods, or while sedentary.^{48,49,51,62,103,121} Gender differences were noted across media types, with a study of news media finding that images of people with overweight or obesity were more frequently women and women with overweight or obesity were more likely to be the subject of abuse in social media comments,^{23,111} while studies of television shows and YouTube videos found that men were more likely to be depicted in stigmatising ways.^{22,38} Additionally, pregnant and postpartum women reported expectations around body shape and size created by media content were frequently stigmatising.⁷⁸ There were also some studies that examined differences by race or ethnicity, but findings were inconsistent. For example, one study noted that actors of colour with overweight or obesity were less likely to be represented in media than white people,⁴⁸ while another found Latinos were more likely to be praised in celebrity gossip magazines than other racial groups.⁴⁹ Similarly, Sievert, Lobstein and colleagues¹²¹ found differences between countries, with online media in Japan, Brazil, and New Zealand showing a higher proportion of positive images of people with overweight and obesity, while Italy, Hong Kong, and South Africa showed a higher proportion of negative images. The authors did not explain why these differences might exist. Another study also showed that negative depictions had declined over time in two news outlets in the US.⁴³

Overt or covert discourses in news media, social media, and public health campaigns included depiction of people with overweight or obesity as being lazy, greedy, undisciplined, unhappy, unattractive, and

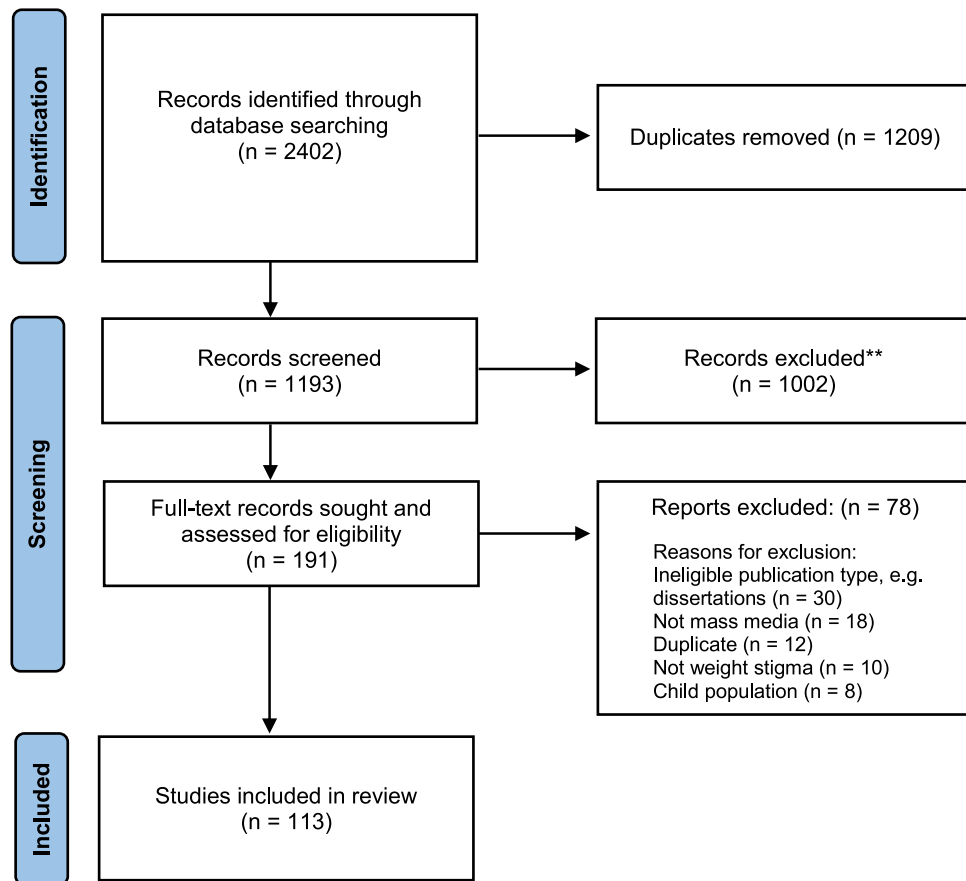


Figure 1. Study Selection.

stupid.^{21,35,38,44,47,72,80,85,100,107–109,115–117,120,123,124} Entertainment media similarly presented people with overweight or obesity as subjects of humour and ridicule, and as deserving of harsh treatment.^{21,39,44} Previte and Gurrieri⁹⁹ argued that people with overweight or obesity in the media were pathologised, gazed upon, marginalised, controlled, and gendered. These discourses generate and reinforce a view of overweight and obesity as an individual responsibility, assigning blame and shame to the individual. Simultaneously, they normalise and idealise thinness, and ignore or downplay systemic and biological factors that contribute to overweight and obesity.^{9,96,106,114} Other studies noted that anti-fat rhetoric was used to ‘frighten’ women into losing weight¹¹⁸ and to overemphasise the benefits of bariatric surgery.^{82,105,112} Five studies served to highlight the role of social media and public commentary on news articles, arguing that their anonymous nature facilitates stigmatising comments from the public,^{9,81,101,117} especially when journalists had made stigmatising remarks about a person’s weight in the associated content.²⁹ Lessard and Puhl⁷⁶ also found increased exposure to stigmatising social media content during the Covid-19 pandemic amongst US adolescents.

Impact of stigma exposure on attitudes, beliefs, intentions, and behaviours

Many studies assessed the impact of various types of mass media portrayal of overweight and obesity on observers’ weight-related attitudes and beliefs. Some of these studies used ‘real world’ media examples, while others created their own content. Studies compared the impact of positively and negatively framed content, either in comparison to controls or within participants before and after exposure. There were two main areas of interest: the impact of stigmatising content on beliefs and attitudes to overweight and obesity as an issue; and the impact of stigmatising content on beliefs and attitudes about people with overweight or obesity, or about one’s own appearance or body satisfaction. Some studies also assessed whether any media exposure was linked to stigmatising attitudes and beliefs.^{28,46}

Exposure to stigmatising content consistently affected attitudes towards weight and people with overweight or obesity. Exposure to content that disparaged or negatively framed people with overweight or obesity was associated with stronger beliefs in the health risk of overweight and obesity and personal responsibility for overweight and obesity and increased dislike for people

Study characteristics		References		
		Quantitative studies	Qualitative studies	Other study type
Presence of weight stigma in media content	Advertising	18	48,118	
	Entertainment	39	21,23,27,38,44,52,68,71,72,113,120	
	News media	41,106,112	20,29,43,49,62,78,81,82,85,96,99-101, 103,105,107,108,111,114,116,121-123	
	Public health messaging or campaigns	17,69,80	109	115
	Social media	22,65,76,124	35,47,117	9,75
	Multiple media	77,91		6,36,53,79
Impact of stigma exposure on attitudes, beliefs, intentions, and behaviours	Advertising	18,34,42,45		
	Entertainment	24,32,37,39,46,55,64		
	Images	51		
	News media	30,40,41,63,84,102	25,86,95,101	7
	Public health messaging or campaigns	17,57,66,74,87,89,90,98	33,92,97,104	
	Social media	76,119	110	9,75
Addressing weight stigma in the media	Advertising			
	Entertainment			
	Images	54,56,61		
	News media	40,63	93,96,107	
	Public health messaging or campaigns	15-17,19,31,50,58,60,73,83	88,92,94	
	Social media		70	75
Multiple media	67		36,59	

Table 1: Summary of study characteristics.

with overweight or obesity.^{7,32,41,42,119} Similarly, framing obesity as a ‘public health crisis’ in news reporting increased anti-fat attitudes,⁶³ while exposure to fat-positive frames generally shifted anti-fat attitudes and beliefs related to overweight and obesity-causation in a positive direction more than exposure to fat-negative frames.^{33,40}

Actual or perceived size of the observer appeared to influence anti-fat attitudes, with thinner people and people who were not trying to lose weight especially likely to increase their anti-fat attitudes after exposure to weight-loss shows like *The Biggest Loser*,³⁷ and those who self-identified as not overweight being more likely to socially exclude people who are overweight after exposure to stigmatising content.⁶⁴ Conversely, people with overweight or obesity felt excluded from and ridiculed by news media because their bodies defy social norms.^{86,95} Personal beliefs were also noted as potentially mediating the effects of stigmatising content. For example, one study showed that participants’ anti-fat attitudes measured after exposure to stigmatising content were mediated by their body satisfaction⁴⁶ and another showed that those with a higher perceived

pressure to be thin were more likely to express body dissatisfaction after reading an anti-obesity article.⁸⁴ Covid-19 pandemic-related increases in body dissatisfaction were also noted amongst adolescents, especially those of higher weight, following exposure to stigmatising social media content,⁷⁶ although a review noted that there was still insufficient evidence to fully understand the impact of weight stigma during the pandemic.⁷⁹

Several studies considered whether mass media and social marketing campaigns designed to address weight-related behaviours or other anti-obesity messages contribute to stigmatisation.^{57,66,74,87,90,92,97,98,104} Most of these studies concluded that such interventions might contribute to stigmatising attitudes, but this was often based on author critique and not empirical tests.^{74,90,92,97,104} Of those that did test it empirically, the evidence was mixed. One study found no evidence that a graphic mass media campaign had increased weight stigma,⁸⁷ while others found stigmatising campaigns were associated with lower self-efficacy for behaviour change,^{57,66} and an experimental study found that the imagery used can influence stigma-related attitudes.⁹⁸

While exposure to stigmatising content was found in general to increase stigmatising beliefs and attitudes, some counterintuitive findings were also noted. One study, for instance, found that people who identified as overweight were more likely to express body satisfaction when exposed to stigmatising content and increase their positive treatment of other people who are overweight, compared to when exposed to neutral media.⁶⁴ Further, Lin and McFerran⁴⁵ found that positive portrayals of larger body types can have unintended consequences such as a reduction in motivation to improve health, greater consumption of unhealthy food items, and creation of meals with higher calories.

Studies investigated whether portrayals of overweight and obesity in media influenced people's intentions and behaviours.^{39,40,55,64,84,89,102} One study found that people's intention to diet if they gained weight was higher with negatively framed 'obesity crisis' news reports but not positively framed reports.⁴⁰ Other studies found that exposure to stigmatising media content may lead to weight gain and undermine efforts to lose weight,¹⁰² and may interact with the experience of stigma not only to increase exercise intentions, motivation and behaviour, but also to increase a desire for thinness.⁵⁵ This may have negative consequences as it centres on weight loss, not health. Additionally, adolescents with experience of weight stigma were found to use strategies to hide their weight status on social media.¹¹⁰ Some differential effects by gender were evident, with Eisenberg, Ward and colleagues³⁹ finding that body satisfaction was lower amongst girls (but not boys) who had higher exposure to weight and shape-related teasing in TV shows than girls with lower exposure.

Addressing weight stigma in the media

Some studies explored public support for policy options to reduce stigmatising media content. Interviews with people with overweight or obesity found views both in favour and opposed to whether media guidelines to reduce stigmatisation or to control the portrayal of overweight and obesity should be considered as a policy option,⁹³ while USA parents supported policies to address weight stigmatisation of children in media.⁶⁷ Some authors argued that the stigmatising discourse of individual responsibility evident in the media might undermine support for effective policy solutions.^{63,73,96} However, there was some evidence that framing of messages in the media had limited impact on support for public policies.^{40,60}

A few studies sought to identify characteristics of media that may minimise or avoid weight stigma. Images and messages that were less likely to be stigmatising were focused on healthy behaviour changes,^{58,94} included people with similar physical characteristics to message recipients,³¹ used non-stereotypical images and text,^{54,56,61,107} and did not mention the term 'obesity'.⁵⁸ There was also some preliminary evidence that testimonial-style messages, messages that address

myths and misunderstandings, and a mixture of biomedical and biopsychosocial frames may be effective in reducing stigma.^{19,50,83} Some authors emphasised a need for media-based interventions that recognise the wider influences on weight-related behaviours.^{88,92,94} Clark, Lee and colleagues⁷⁵ argued that social media platforms should change their terms of use to explicitly include policies against weight stigma and ensure that their algorithms avoid privileging stigmatising materials over positive material and voices. The few studies that considered terminology were consistent in concluding that the terms 'obese' and 'obesity' should be avoided in media, but recognised that there is otherwise considerable variation in opinions on alternatives, depending on the characteristics (e.g. race/ethnicity, gender, or weight status) of the person asked and the context within which the terms might be used.^{59,70} For example, 'fat' was considered stigmatising in certain contexts but not others. An experimental study of anti-stigma messaging to address workplace discrimination and anti-fat attitudes found positive effects from fat-positive reporting.⁴⁰ Diedrichs, Puhl and colleagues³⁶ also noted that public health strategies designed to promote physical activity and nutrition messages without focusing on weight are viewed more positively and are more likely to motivate behaviour change.

Studies of media interventions to reduce stigmatisation of people with overweight or obesity were rare but we identified an educational film targeting trainee health professionals¹⁵ and a video campaign aimed at reducing weight-based stigma towards children with overweight or obesity.¹⁶ These studies provide preliminary evidence that media interventions have the potential to address weight-based stigma, with one study noting improvements in explicit but not implicit weight bias.¹⁵ Variations in effects by gender and weight status were observed in the other study, with participants who were overweight and/or female being more likely to reduce weight-based stigma compared with those who were thin and male.¹⁶ Additionally, Rathbone, Cruwys and colleagues¹⁷ tested public health messages and found that those that challenge weight stigma and promote body positivity had positive effects on some psychological indicators of health and well-being for people of all body sizes. Body positive commercial advertising campaigns, however, were not found to improve weight stigma attitudes.¹⁸

Discussion

Our review found that stigmatising presentations of people with overweight or obesity are highly prevalent in mass media and that media discourses contribute negatively to the social construction of the 'obesity problem'; that is, that fatness is inherently bad, should be avoided at all costs, and that individuals have complete control over, and therefore responsibility for, their weight. Taken together, these factors contribute to and

reinforce anti-fat attitudes, beliefs, and perceptions, as well as encourage stigmatising behaviours towards people with overweight or obesity and reduce the likelihood of effective policy action. Critically, though, we also found limited evidence on how to minimise or prevent stigmatising media content and even less on specifically addressing weight stigma through media interventions. Our review highlights the complex issues that must be considered in developing policy and practice responses to stigma in mass media.

As found in other reviews, the included studies demonstrate unequivocally that stigmatising content is present across all media types, including news, entertainment, advertising, and social media.^{26,53} This occurs through dehumanising imagery, depicting stereotypical behaviours, and other negative representations. Moreover, experimental studies showed that, in general, individuals held more stigmatising views after exposure to stigmatising content. At the same time, the impact of this exposure may be mediated by personal beliefs, body satisfaction, and other perceptions and experiences, including lived experiences of stigma. Some studies also noted differences in the impacts by gender and weight status, with women and people with overweight or obesity tending to exhibit fewer stigmatising attitudes after exposure to stigmatising material, but also lower body satisfaction. However, the reasons for these differences are unclear. It may be that as these populations are more likely to experience weight-based stigma^{125–127} they have a greater ability to empathise. The interaction between media-based stigma and stigmatising attitudes is therefore complex, with exposures interacting with socio-demographic characteristics, existent beliefs about people with overweight or obesity, and body image. While further research on the differences between different socio-demographic groups, such as age, and media-based stigma is warranted, our review confirms that weight stigmatising content is highly prevalent in mass media and that it perpetuates negative attitudes and beliefs.

A key element in the persistence of stigmatising content in media appears to be the bidirectional relationship with dominant discourses around the causes of overweight and obesity. These discourses, both reinforced by and generative of public commentary on mass media, tend to attribute responsibility for overweight and obesity to individuals while failing to build or consolidate an understanding of biological factors and the more complex societal and environmental contributors. This is not unique to media, however, with studies of overweight and obesity policies and mass media overweight and obesity prevention campaigns finding that the focus is predominantly on individual behaviours.^{128–130} Despite their intent, in reality, these discourses reinforce that overweight and obesity can be solved by individual choice only, rendering the wider systemic causes (junk food marketing, processed food supply, social isolation,

poverty etc.) invisible and unchallenged. It appears that a similar process occurs in media, with systemic causes downplayed or ignored, which ultimately contributes to weight stigma. We echo the call of others that this must change if there is to be a reduction in stigmatising content on media and, ultimately, a reduction in weight stigma across society.^{7,131,132}

To change the discourse on weight, content creators and distributors, policymakers, and other parties need to take action to avoid or minimise stigmatising content on media, with greater emphasis on how to address weight stigma proactively through mass media-based interventions. Our review found that using positive language and images of people with overweight or obesity may assist in minimising stigmatising content. Resources are already available on the choice of language and imagery when reporting on obesity-related issues (e.g., The Obesity Collective¹³³). In addition, these parties should ensure there is representation of people of different body shapes and sizes more generally in media including, but not restricted to, content that is specific to weight or health. More research is needed particularly in relation to social media, as these platforms were understudied in comparison with their widespread use and their potential to perpetuate stigma is already clear. Careful evaluation of efforts to destigmatise content is also required to ensure there are no unintended consequences of these changes, such as demotivation to improve health as indicated by Lin and McFerran.⁴⁵ Further, unintended consequences might be avoided by shifting the narrative on overweight and obesity to focus on nutrition and physical activity rather than weight.³⁶

Our review found only two studies which specifically examined proactive media-based interventions to address weight stigma, of which only one could truly be said to make use of mass media.¹⁶ There is thus very little guidance we can derive from the peer review evidence on whether mass media interventions have the potential to reduce stigmatising attitudes, as has been found in a review of weight stigma in contexts other than mass media.¹³⁴ More interventions are needed, especially as weight stigma continues to be so prevalent. It is essential that these interventions follow best practice approaches, such as those outlined in the FLOW-PROOF protocol.¹³⁵ This includes extensive formative research with the target audience and with people with overweight or obesity. This research should focus on terminology, given the contested nature of what is and what is not appropriate, and ways of shifting the dominant discourse away from individual responsibility and toward the systemic causes of overweight and obesity.

A limitation of our review is that, although we did not exclude studies based on language, our search terms were in English, reducing the likelihood of including studies conducted in non-English speaking countries and populations. Perhaps consequently, the included

studies were predominantly from English-speaking countries, especially the United States, and therefore our findings may not reflect important cultural differences in weight stigma prevalence and intervention on media. Additionally, some relevant studies may have been missed because they are more implicit in their discussion of stigma (e.g. referring to public discourse or opinion) and thus would not have been found by our search terms. Finally, although we conducted a systematic synthesis of the findings, because of their heterogeneity we were only able to provide a narrative summary of the included studies.

There can be no doubt that stigmatising content is highly prevalent in all types of mass media and that this needs to change if we are to reduce weight stigma and its harms. Critically, a change in discourse in media needs to occur, with the focus shifting to systemic causes of overweight and obesity. Public health policymakers, practitioners, and researchers should drive this shift, in partnership with empowered consumers and the media. At the same time, our review found that a pathway, proactively to reduce stigma through media is largely unclear. The focus of weight stigma research must progress from assessing the prevalence and impacts of media content to an evaluation of interventions to address stigma through media.

Declaration of interests

Dr. Kite reports grants from Quit Tasmania, outside the submitted work. Dr. Williams reports personal fees from NovoNordisk, personal fees from Pfizer, personal fees from Lilly, outside the submitted work. Dr. Thomas has nothing to disclose. Dr. Grunseit has nothing to disclose. Dr. Bellew has nothing to disclose. Dr. Laird has nothing to disclose. Mr. Huang has nothing to disclose. Dr. McGill has nothing to disclose.

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Contributors

JK led the preparation of the manuscript. MT, YL, BM and BH conducted the searches and excluded duplicates. BB conceived the study. JK, BH, BM, YL, AG, MT, and BB screened studies, conducted quality appraisal and extracted data. All authors contributed to the review design, synthesis of findings, and writing of the manuscript. All the authors agreed to submit the manuscript for publication.

Data sharing

All data extracted for this study are available upon request upon request to the corresponding author.

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Supplementary materials

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References

- 1 World Health Organization. Weight bias and obesity stigma: considerations for the WHO European Region. 2017. <https://www.euro.who.int/en/health-topics/noncommunicable-diseases/obesity/publications/2017/weight-bias-and-obesity-stigma-considerations-for-the-who-european-region-2017>.
- 2 Wu YK, Berry DC. Impact of weight stigma on physiological and psychological health outcomes for overweight and obese adults: a systematic review. *J Adv Nurs*. 2018;74(5):1030–1042.
- 3 Hart LM, Ferreira KB, Ambwani S, Gibson EB, Austin SB. Developing expert consensus on how to address weight stigma in public health research and practice: a Delphi study. *Stigma and Health*. 2021;6(1):79–89.
- 4 Zhao Y, Zhang J. Consumer health information seeking in social media: a literature review. *Health Info Libr J*. 2017;34(4):268–283.
- 5 Gollust SE, Fowler EF, Niederdeppe J. Television news coverage of public health issues and implications for public health policy and practice. *Annu Rev Public Health*. 2019;40(1):167–185.
- 6 Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*. 2009;17(5):941–964.
- 7 Rubino F, Puhl RM, Cummings DE, et al. Joint international consensus statement for ending stigma of obesity. *Nat Med*. 2020;26(4):485–497.
- 8 Treasure J, Ambwani S. Addressing weight stigma and anti-obesity rhetoric in policy changes to prevent eating disorders. *Lancet*. 2021;398(10294):7–8.
- 9 Wanniarachchi VU, Mathrani A, Susnjak T, Scogings C. A systematic literature review: what is the current stance towards weight stigmatization in social media platforms? *Int J Hum Comput Stud*. 2020;135.
- 10 Bellew B, Grunseit A, Huang B, et al. Weight stigma and bias - what is known? *Rapid review of evidence: The University of Sydney*. 2020.
- 11 Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*. 2009;339:b2535.
- 12 Joanna Briggs Institute. Critical Appraisal Tools 2020. <https://jbi.global/critical-appraisal-tools>. Accessed 18 August 2021.
- 13 Pieper D, Koensgen N, Breuing J, Ge L, Wegewitz U. How is AMSTAR applied by authors - a call for better reporting. *BMC Med Res Methodol*. 2018;18(1):56.
- 14 Lizarondo L, Stern C, Carrier J, et al. Chapter 8: mixed methods systematic reviews. In: Aromataris E, Munn Z, eds. *JBI Manual for evidence synthesis*. JBI; 2020.
- 15 Swift JA, Tischler V, Markham S, et al. Are anti-stigma films a useful strategy for reducing weight bias among trainee healthcare professionals? Results of a pilot randomized control trial. *Obes Facts*. 2013;6(1):91–102.
- 16 Barry CL, Gollust SE, McGinty EE, Niederdeppe J. Effects of messages from a media campaign to increase public awareness of childhood obesity. *Obesity (Silver Spring)*. 2014;22(2):466–473.
- 17 Rathbone JA, Cruwys T, Jettan J. Non-stigmatising alternatives to anti-obesity public health messages: consequences for health behaviour and well-being. *J Health Psychol*. 2021(9703616) 1359105321999705.
- 18 Selensky JC, Carels RA. Weight stigma and media: an examination of the effect of advertising campaigns on weight bias, internalized weight bias, self-esteem, body image, and affect. *Body Image*. 2021;36. (Aerie. (2016, August 1). The share your spark experience [Video]. Youtube. <https://www.youtube.com/watch?v=UktgRClp7Bc>. Alberga, AS, Pickering, BJ, Alix Hayden, K, Ball, GDC, Edwards, A, Jelinski, S, et al. (2016). Weight bias reduction in health): 95–106.

- 19 Heley K, Kennedy-Hendricks A, Niederdeppe J, Barry CL. Reducing health-related stigma through narrative messages. *Health Commun.* 2020;35(7):849–860.
- 20 Heuer CA, McClure KJ, Puhl RM. Obesity stigma in online news: a visual content analysis. *J Health Commun.* 2011;16(9):976–987.
- 21 Himes SM, Thompson JK. Fat stigmatization in television shows and movies: a content analysis. *Obesity (Silver Spring).* 2007;15(3):712–718.
- 22 Hussin M, Frazier S, Thompson JK. Fat stigmatization on YouTube: a content analysis. *Body Image.* 2011;8(1):90–92.
- 23 Jeon YA, Hale B, Knackmuhs E, Mackert M. Weight stigma goes viral on the internet: systematic assessment of YouTube comments attacking overweight men and women. *Interact J Med Res.* 2018;7(1):e6.
- 24 Katterman SN, Klump KL. Stigmatization of eating disorders: a controlled study of the effects of the television show *Starved*. *Eating Disorders.* 2010;18(2):153–164.
- 25 Anderson J, Zhu Y, Zhuang J, Nelson JC, Bresnahan MJ, Yan X. Metaphors that communicate weight-based stigma in political news: a case study of New Jersey Governor Chris Christie. *European Rev Appl Psychol / Revue Europeenne de Psychologie Appliquee.* 2017;67(3):139–146.
- 26 Ata RN, Thompson JK. Weight bias in the media: a review of recent research. *Obes Facts.* 2010;3(1):41–46.
- 27 Backstrom L. From the freak show to the living room: cultural representations of dwarfism and obesity. *Sociological Forum.* 2012;27(3):682–707.
- 28 Bennett BL, Wagner AF, Obleada KT, Latner JD. Appearance-focused media use as a moderator of the relationship between fear of fat and weight bias: an exploratory study. *Eat Weight Disord.* 2020;25(3):643–648.
- 29 Bresnahan M, Zhuang J, Anderson J, Zhu Y, Viken G. “Governor of the House of Pancake”: a content analysis of the political framing of Chris Christie’s size in online news media. *Fat Studies.* 2017;6(1):2–16.
- 30 Brochu PM, Pearl RL, Puhl RM, Brownell KD. Do media portrayals of obesity influence support for weight-related medical policy? *Health Psychol.* 2014;33(2):197–200.
- 31 Buller MK, Andersen PA, Bettinghaus EP, et al. Randomized trial evaluating targeted photographic health communication messages in three stigmatized populations: physically-disabled, senior, and overweight/obese individuals. *J Health Commun.* 2018;23(10–11):886–898.
- 32 Burmeister JM, Carels RA. Weight-related humor in the media: appreciation, distaste, and anti-fat attitudes. *Stigma and Health.* 2015;1(5):92–107.
- 33 Burmeister JM, Taylor MB, Rossi J, Kiefner-Burmeister A, Borushok J, Carels RA. Reducing obesity stigma via a brief documentary film: a randomized trial. *Stigma and Health.* 2017;2(1):43–52.
- 34 Castonguay J, Bakir A, Blodgett JG. Adolescents’ responses to cereal ads: an assessment of weight and gender. *J Food Products Market.* 2019;25(8):785–804.
- 35 Chou WY, Prestin A, Kunath S. Obesity in social media: a mixed methods analysis. *Transl Behav Med.* 2014;4(3):314–323.
- 36 Diedrichs PC, Puhl R, Sibley CG, Barlow FK. Weight bias: prejudice and discrimination toward overweight and obese people. In: Sibley C, Barlow F, eds. *The Cambridge Handbook of the Psychology of Prejudice*. Cambridge: Cambridge University Press; 2017:392–412.
- 37 Domoff SE, Hinman NG, Koball AM, et al. The effects of reality television on weight bias: an examination of *The Biggest Loser*. *Obesity (Silver Spring).* 2012;20(5):993–998.
- 38 Eisenberg ME, Carlson-McGuire A, Gollust SE, Neumark-Sztainer D. A content analysis of weight stigmatization in popular television programming for adolescents. *Int J Eat Disord.* 2015;48(6):759–766.
- 39 Eisenberg ME, Ward E, Linde JA, Gollust SE, Neumark-Sztainer D. Exposure to teasing on popular television shows and associations with adolescent body satisfaction. *J Psychosom Res.* 2017;103(0376333):15–21.
- 40 Frederick DA, Saguy AC, Sandhu G, Mann T. Effects of competing news media frames of weight on antifat stigma, beliefs about weight and support for obesity-related public policies. *Int J Obes (Lond).* 2016;40(3):543–549.
- 41 Frederick DA, Tomiyama AJ, Bold JG, Saguy AC. Can she be healthy at her weight? Effects of news media frames on antifat attitudes, dieting intentions, and perceived health risks of obesity. *Stigma and Health.* 2020;5(3):247–257.
- 42 Geier AB, Schwartz MB, Brownell KD. Before and after” diet advertisements escalate weight stigma. *Eating Weight Disorders.* 2003;8(4):282–288.
- 43 Gollust SE, Eboh I, Barry CL. Picturing obesity: analyzing the social epidemiology of obesity conveyed through US news media images. *Soc Sci Med.* 2012;74(10):1544–1551.
- 44 Greenleaf C, Klos L, Hauff C, Hennum A, Pozoliniski B, Serafin G. “Unless you puke, faint, or die, keep going!” Exploring weight stigma in the gym on *The Biggest Loser*. *Fat Studies.* 2019;8(2):110–126.
- 45 Lin L, McFerran B. The (ironic) dove effect: use of acceptance cues for larger body types increases unhealthy behaviors. *J Public Policy & Market.* 2016;35(1):76–90.
- 46 Lin L, Reid K. The relationship between media exposure and antifat attitudes: the role of dysfunctional appearance beliefs. *Body Image.* 2009;6(1):52–55.
- 47 Lydecker JA, Cotter EW, Palmberg AA, et al. Does this Tweet make me look fat? A content analysis of weight stigma on Twitter. *Eat Weight Disord.* 2016;21(2):229–235.
- 48 Lydecker JA, Izzo A, Spielberger G, Grilo CM. I only watch for the commercials”: messages about weight, eating and race in Super Bowl advertisements. *Int J Clin Pract.* 2017;71(11):e13026.
- 49 McDonnell A, Lin L. The hot body issue: weight and caption tone in celebrity gossip magazines. *Body Image.* 2016;18(101222431):74–77.
- 50 Meyer J-H, De Ruyter K, Grewal D, Cleeren K, Keeling DI, Motyka S. Categorical versus dimensional thinking: improving anti-stigma campaigns by matching health message frames and implicit world-views. *J Acad Market Sci.* 2019;48(2):222–245.
- 51 Oliver MD, Datta S, Baldwin DR. A sympathetic nervous system evaluation of obesity stigma. *PLoS ONE.* 2017;12(10):e0185703.
- 52 Parrott S. When Everyone is laughing: The presence, characteristics, and Enjoyment of Disparagement Humor in Online TV. 19. *Mass Communication & Society.* 2016:49–73.
- 53 Pearl RL. Weight bias and stigma: public health implications and structural solutions. *Soc Issues Policy Rev.* 2018;12(1):146–182.
- 54 Pearl RL, Dovidio JF, Puhl RM. Visual portrayals of obesity in health media: promoting exercise without perpetuating weight bias. *Health Educ Res.* 2015;30(4):580–590.
- 55 Pearl RL, Dovidio JF, Puhl RM, Brownell KD. Exposure to weight-stigmatizing media: effects on exercise intentions, motivation, and behavior. *J Health Commun.* 2015;20(9):1004–1013.
- 56 Pearl RL, Puhl RM, Brownell KD. Positive media portrayals of obese persons: impact on attitudes and image preferences. *Health Psychol.* 2012;31(6):821–829.
- 57 Puhl R, Luedicke J, Lee Peterson J. Public reactions to obesity-related health campaigns: a randomized controlled trial. *Am J Prev Med.* 2013;45(1):36–48.
- 58 Puhl R, Peterson JL, Luedicke J. Fighting obesity or obese persons? Public perceptions of obesity-related health messages. *Int J Obes (Lond).* 2013;37(6):774–782.
- 59 Puhl RM. What words should we use to talk about weight? A systematic review of quantitative and qualitative studies examining preferences for weight-related terminology. *Obes Rev.* 2020;21(6):e13008.
- 60 Puhl RM, Heuer C, Sarda V. Framing messages about weight discrimination: impact on public support for legislation. *Int J Obes (Lond).* 2011;35(6):863–872.
- 61 Puhl RM, Luedicke J, Heuer CA. The stigmatizing effect of visual media portrayals of obese persons on public attitudes: does race or gender matter? *J Health Commun.* 2013;18(7):805–826.
- 62 Puhl RM, Peterson JL, DePierre JA, Luedicke J. Headless, hungry, and unhealthy: a video content analysis of obese persons portrayed in online news. *J Health Commun.* 2013;18(6):686–702.
- 63 Saguy AC, Frederick D, Gruys K. Reporting risk, producing prejudice: how news reporting on obesity shapes attitudes about health risk, policy, and prejudice. *Soc Sci Med.* 2014;111(ut9):125–133. 8303205.
- 64 Savoy S, Boxer P. The impact of weight-biased media on weight attitudes, self-attitudes, and weight-biased behavior. *Psychol Popular Media.* 2020;9(1):31–44.
- 65 Schuldt JP, Guillory JE, Gay GK. Prejudice and the Plate: effects of Weight Bias in Nutrition Judgments. *Health Commun.* 2016;31(2):182–192.
- 66 Simpson CC, Griffin BJ, Mazzeo SE. Psychological and behavioral effects of obesity prevention campaigns. *J Health Psychol.* 2019;24(9):1268–1281.
- 67 Suh Y, Puhl R, Liu S, Fleming Milici F. Parental support for policy actions to reduce weight stigma toward youth in schools and

- children's television programs: trends from 2011 to 2013. *Child Obes.* 2014;10(6):533–541.
- 68 Throop EM, Skinner AC, Perrin AJ, Steiner MJ, Odulana A, Perrin EM. Pass the popcorn: "obesogenic" behaviors and stigma in children's movies. *Obesity (Silver Spring)*. 2014;22(7):1694–1700.
- 69 Vaala SE, Bleakley A, Hennessy M, Jordan AB. Weight stigmatization moderates the effects of sugar-sweetened beverage-related PSAs among U.S. parents. *Media Psychol.* 2016;19(4):534–560.
- 70 Webb JB, Vinoski ER, Bonar AS, Davies AE, Etzel L. Fat is fashionable and fit: a comparative content analysis of Fatspiration and Health at Every Size((R)) Instagram images. *Body Image*. 2017;22. ((Webb, Davies) UNC Charlotte, Department of Psychological Science, United States(Vinoski) UNC Charlotte, Department of Public Health Sciences, United States(Bonar) UNC Chapel Hill, Department of Psychology, United States(Etzel) Queens University, Departme): 53–64.
- 71 Yoo JH. No clear winner: effects of The Biggest Loser on the stigmatization of obese persons. *Health Commun.* 2013;28(3):294–303.
- 72 Yoo JH, Kim J. Obesity in the new media: a content analysis of obesity videos on YouTube. *Health Commun.* 2012;27(1):86–97.
- 73 Young R, Hinnant A, Leshner G. Individual and social determinants of obesity in strategic health messages: interaction with political ideology. *Health Commun.* 2016;31(7):903–910.
- 74 Young R, Subramanian R, Hinnant A. Stigmatizing images in obesity health campaign messages and healthy behavioral intentions. *Health Educ Behav.* 2016;43(4):412–419.
- 75 Clark O, Lee MM, Jingree ML, et al. Weight stigma and social media: evidence and public health solutions. *Front Nutr.* 2021;8:739056.
- 76 Lessard LM, Puhl RM. Adolescents' exposure to and experiences of weight stigma during the COVID-19 pandemic. *J Pediatr Psychol.* 2021;46(8):950–959.
- 77 Mensinger JL, Cox SA, Henretty JR. Treatment outcomes and trajectories of change in patients attributing their eating disorder onset to anti-obesity messaging. *Psychosom Med.* 2021;83(7):777–786.
- 78 Nippert KE, Tomiyama AJ, Smieszek SM, Incollingo Rodriguez AC. The media as a source of weight stigma for pregnant and postpartum women. *Obesity (Silver Spring, Md)*. 2021;29(1):226–232.
- 79 Pearl RL, Schulte EM. Weight bias during the COVID-19 pandemic. *Curr Obes Rep.* 2021;10(2):181–190.
- 80 Turner MM, Ford L, Somerville V, Javellana D, Day KR, Lapinski MK. The use of stigmatizing messaging in anti-obesity communications campaigns: quantification of obesity stigmatization. *Commun Reports.* 2020;33(3):107–120.
- 81 Glenn NM, Champion CC, Spence JC. Qualitative content analysis of online news media coverage of weight loss surgery and related reader comments. *Clin Obes.* 2012;2(5–6):125–131.
- 82 Glenn NM, McGannon KR, Spence JC. Exploring media representations of weight-loss surgery. *Qual Health Res.* 2013;23(5):631–644.
- 83 Ramos Salas X, Forhan M, Sharma AM. Diffusing obesity myths. *Clin Obes.* 2014;4(3):189–196.
- 84 Shentow-Bewsh R, Keating L, Mills JS. Effects of anti-obesity messages on women's body image and eating behaviour. *Eat Behav.* 2016;20:48–56.
- 85 Ries NM, Rachul C, Caulfield T. Newspaper reporting on legislative and policy interventions to address obesity: united States, Canada, and the United Kingdom. *J Public Health Policy.* 2011;32(1):73–90.
- 86 Dickins M, Browning C, Feldman S, Thomas S. Social inclusion and the Fatosphere: the role of an online weblogging community in fostering social inclusion. *Sociol Health Illn.* 2016;38(5):797–811.
- 87 Morley B, Niven P, Dixon H, et al. 2014 world congress abstracts, 3–6 december 2014, Melbourne, Australia. *Asia Pac J Clin Oncol.* 2014;10(SUPPL. 9):1–263.
- 88 Thomas SL, Lewis S, Hyde J, Castle D, Komesaroff P. "The solution needs to be complex." Obese adults' attitudes about the effectiveness of individual and population based interventions for obesity. *BMC Public Health.* 2010;10:420.
- 89 Dixon H, Scully M, Cotter T, Maloney S, Wakefield M. Healthy weight and lifestyle advertisements: an assessment of their persuasive potential. *Health Educ Res.* 2015;30(4):569–579.
- 90 Dixon H, Scully M, Durkin S, et al. Finding the keys to successful adult-targeted advertisements on obesity prevention: an experimental audience testing study. *BMC Public Health.* 2015;15:804.
- 91 Lawrie Z, Sullivan EA, Davies PS, Hill RJ. Media influence on the body image of children and adolescents. *Eat Disord.* 2006;14(5):355–364.
- 92 Couch D, Fried A, Komesaroff P. Public health and obesity prevention campaigns – a case study and critical discussion. *Commun Res Pract.* 2017;4(2):149–166.
- 93 Holland K, Blood RW, Thomas SL, Lewis S. Challenging stereotypes and legitimating fat: an analysis of obese people's views on news media reporting guidelines and promoting body diversity. *J Sociol.* 2015;51(2):431–445.
- 94 Lewis S, Thomas SL, Hyde J, Castle D, Blood RW, Komesaroff PA. "I don't eat a hamburger and large chips every day!" A qualitative study of the impact of public health messages about obesity on obese adults. *BMC Public Health.* 2010;10(100968562):309.
- 95 Couch D, Thomas SL, Lewis S, Blood RW, Komesaroff P. Obese adults' perceptions of news reporting on obesity. *Sage Open.* 2015;5(4):1–14.
- 96 Farrell LC, Warin MJ, Moore VM, Street JM. Emotion in obesity discourse: understanding public attitudes towards regulations for obesity prevention. *Sociol Health Illn.* 2016;38(4):543–558.
- 97 Gurrieri L, Previte J, Brace-Govan J. Women's bodies as sites of control. *Journal of Macromarketing.* 2012;33(2):128–143.
- 98 Johnstone G, Grant SL. Weight stigmatisation in antiobesity campaigns: the role of images. *Health Promot J Austr.* 2019;30(1):37–46.
- 99 Previte J, Gurrieri L. Who is the biggest loser? fat news coverage is a barrier to healthy lifestyle promotion. *Health Mark Q.* 2015;32(4):330–349.
- 100 Lupton D. 'A grim health future': food risks in the Sydney press. *Health Risk Soc.* 2004;6(2):187–200.
- 101 Brooker P, Barnett J, Vines J, Lawson S, Feltwell T, Long K. Doing stigma: online commenting around weight-related news media. *New Media & Society.* 2018;20(9):3201–3222.
- 102 Lambert ER, Koutoukidis DA, Jackson SE. Effects of weight stigma in news media on physical activity, dietary and weight loss intentions and behaviour. *Obes Res Clin Pract.* 2019;13(6):571–578.
- 103 Patterson C, Hilton S. Normalisation and Stigmatisation of Obesity in UK Newspapers: a Visual Content Analysis. *Open Obes J.* 2013;5(101551494):82–91.
- 104 Piggins J, Lee J. 'Don't mention obesity': contradictions and tensions in the UK Change4Life health promotion campaign. *J Health Psychol.* 2011;16(8):1151–1164.
- 105 Williamson JM, Rink JA, Hewin DH. The portrayal of bariatric surgery in the UK print media. *Obes Surg.* 2012;22(11):1690–1694.
- 106 Baker P, Brookes G, Atanasova D, Flint SW. Changing frames of obesity in the UK press 2008–2017. *Soc Sci Med.* 2020;264(8303205)113403.
- 107 Flint SW, Hudson J, Lavalley D. The portrayal of obesity in U.K. national newspapers. *Stigma and Health.* 2016;1(1):16–28.
- 108 Inthorn S, Boyce T. 'It's disgusting how much salt you eat!': television discourses of obesity, health and morality. *Int J Cultural Studies.* 2010;13(1):83–100.
- 109 Varshney N. Cancer Research UK's obesity campaign in 2018 and 2019: effective health promotion or perpetuating the stigmatisation of obesity? *J Med Ethics.* 2020. ((Varshney) Liverpool School of Medicine, University of Liverpool, Liverpool, United Kingdom).
- 110 Holmberg C, Berg C, Hillman T, Lissner L, Chaplin JE. Self-presentation in digital media among adolescent patients with obesity: striving for integrity, risk-reduction, and social recognition. *Digit Health.* 2018;4:(101690863)2055207618807603.
- 111 Sandberg H. A matter of looks: the framing of obesity in four Swedish daily newspapers. *Communications.* 2007;32(4):447–472.
- 112 Rahiri JL, Barazanachi A, Gillon A, MacCormick A, Harwood M, Hill A. Portrayal of bariatric surgery in the New Zealand print news media. *ANZ J Surg.* 2019;89(6):689–694.
- 113 Padva G. Heavenly monsters: the politics of the male body in the naked issue of Attitude magazine. *Int J Sexuality & Gender Studies.* 2002;7(4):281–292.
- 114 Malterud K, Ulriksen K. "Norwegians fear fatness more than anything else"—a qualitative study of normative newspaper messages on obesity and health. *Patient Educ Couns.* 2010;81(1):47–52.
- 115 de Boer B, Lemke M. Bringing disgust in through the backdoor in healthy food promotion: a phenomenological perspective. *Med Health Care Philos.* 2021. ((de Boer) University of Twente, Enschede, Netherlands(Lemke) Delft University of Technology, Delft, Netherlands).
- 116 Hilbert A, Ried J. Obesity in print: an analysis of daily newspapers. *Obes Facts.* 2009;2(1):46–51.

- 117 De Brun A, McCarthy M, McKenzie K, McGloin A. Weight stigma and narrative resistance evident in online discussions of obesity. *Appetite*. 2014;72(8006808):73–81.
- 118 Ling ELK, Don ZM. Fat stigmatisation in slimming advertisements in Malaysia. *SEARCH (Malaysia)*. 2013;5(2):1–18.
- 119 Lim Y, An S. Effects of attributions and social media exposure on obesity stigma among Korean adolescents. *Social Behav Personal*. 2018;46(12):2049–2062.
- 120 Council SK, Placek C. Cultural change and explicit anti-fat attitudes in a developing nation: a case study in rural dominica. *Social Medicine*. 2015;9(1):11–21.
- 121 Sievert K, Lobstein T, Baker P. Stigmatizing images in the media - a cross-national survey. *Clin Obes*. 2018;8(6):407–410.
- 122 Saguy AC, Gruys K, Gong S. Social problem construction and national context: news reporting on "overweight" and "obesity" in the United States and France. *Soc Probl*. 2010;57(4):586–610.
- 123 Atanasova D, Koteyko N. Obesity frames and counter-frames in British and German online newspapers. *Health (London)*. 2017;21(6):650–669.
- 124 Lazarus JV, Kakalou C, Palayew A, et al. A Twitter discourse analysis of negative feelings and stigma related to NAFLD, NASH and obesity. *Liver Int*. 2021;41(10):2295–2307.
- 125 Puhl RM, Andreyeva T, Brownell KD. Perceptions of weight discrimination: prevalence and comparison to race and gender discrimination in America. *Int J Obes (Lond)*. 2008;32(6):992–1000.
- 126 Prunty A, Clark MK, Hahn A, Edmonds S, O'Shea A. Enacted weight stigma and weight self stigma prevalence among 3821 adults. *Obes Res Clin Pract*. 2020;14(5):421–427.
- 127 Spahlholz J, Baer N, Konig HH, Riedel-Heller SG, Luck-Sikorski C. Obesity and discrimination - a systematic review and meta-analysis of observational studies. *Obes Rev*. 2016;17(1):43–55.
- 128 Salas XR, Forhan M, Caulfield T, Sharma AM, Raine K. A critical analysis of obesity prevention policies and strategies. *Can J Public Health*. 2017;108(5–6):e598–e608.
- 129 Theis DRZ, White M. Is obesity policy in England fit for purpose? analysis of government strategies and policies, 1992–2020. *Milbank Q*. 2021;99(1):126–170.
- 130 Kite J, Thomas M, Grunseit A, Li V, Bellew W, Bauman A. Results of a mixed methods evaluation of the make healthy normal campaign. *Health Educ Res*. 2020;35(5):418–436.
- 131 Tomiyama AJ, Carr D, Granberg EM, et al. How and why weight stigma drives the obesity 'epidemic' and harms health. *BMC Med*. 2018;16(1):123.
- 132 Flint SW, Nobles J, Gately P, Sahota P. Weight stigma and discrimination: a call to the media. *The Lancet Diabetes & Endocrinol*. 2018;6(3):169–170.
- 133 The Obesity Collective. Weight Stigma. 2020. <https://www.obesityaustralia.org/weight-stigma>. Accessed 17 August 2021.
- 134 Danielsdóttir S, O'Brien KS, Ciao A. Anti-fat prejudice reduction: a review of published studies. *Obes Facts*. 2010;3(1):47–58.
- 135 Grunseit AC, Bellew B, Goldbaum E, Gale J, Bauman A. Mass media campaigns addressing physical activity, nutrition and obesity in Australia: an updated narrative review 2016. <http://preventioncentre.org.au/resources/evidence-reviews/an-updated-narrative-review-mass-media-campaigns-addressing-physical-activity-nutrition-and-obesity-in-australia-1996-2015/>. Accessed 18 August 2021.