

# Weight Stigma and Psychosocial Development in Children and Adolescents with Obesity: A Global Perspective on Mechanisms, Interventions, and Public Health Implications

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## Abstract

Weight stigma—devaluation based on body size—pervasively threatens the psychosocial development of youth with obesity globally. This narrative review synthesizes evidence on its manifestations, prevalence, consequences, mechanisms, and interventions. Worldwide, 40% - 75% of adolescents with obesity experience weight-related stigma across interpersonal, institutional, self-directed, and digital domains, with rising rates in China. Stigma predicts depression, anxiety, eating disorders, social withdrawal, and cognitive impairment, mediated by psychosocial (stereotype threat, social rejection), developmental, and biopsychological (HPA axis dysregulation) pathways. Evidence-based interventions span individual, family, school, community, and policy levels. However, major gaps include Western-centric research and insufficient longitudinal data from China. Future research must prioritize cross-cultural longitudinal designs and participatory approaches. Addressing weight stigma is a public health imperative requiring coordinated action to protect millions of children worldwide.

## Keywords

Weight Stigma, Childhood Obesity, Adolescent Development, Psychosocial Development, Internalized Weight Bias, Mental Health, Public Health, China

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## 1. Introduction

Childhood and adolescent obesity has reached unprecedented levels globally. The Global Burden of Disease Study 2021 reports that the combined prevalence of

overweight and obesity among youth doubled between 1990 and 2021, with obesity alone tripling (GBD 2021 Adolescent BMI Collaborators, 2025). By 2021, an estimated 93.1 million children (5 - 14 years) and 80.6 million adolescents (15 - 24 years) lived with obesity worldwide (GBD 2021 Adolescent BMI Collaborators, 2025). Projections to 2050 indicate rapid increases in southeast Asia, east Asia, and Oceania (GBD 2021 Adolescent BMI Collaborators, 2025). Obesity is biopsychosocial, entailing psychological distress and social marginalisation beyond metabolic consequences (Global Nutrition Target Collaborators, 2025). In China, overweight and obesity among children aged 6 - 17 years reached 11.1% and 7.9%, respectively—the largest absolute number of affected youth globally (Dong et al., 2019; Pan et al., 2021).

Weight stigma refers to social devaluation, stereotyping, and discrimination based on body weight (Puhl & Lessard, 2020). Distinct from obesity's physiological effects, it operates as a psychosocial stressor: the suffering of children with obesity often stems more from social rejection than physical health status (Tomiyama, 2014). The obesity-stigma relationship is bidirectional, forming a vicious cycle (Gmeiner & Warschburger, 2023). A systematic review confirmed associations between weight-related shame and victimisation, disordered eating, depression, and low self-esteem (Czeczor-Bernat et al., 2025). Between 40% and 75% of adolescents with obesity experience weight-related stigmatisation (Puhl & Lessard, 2020).

Existing research has key gaps: geographic concentration in Western countries, predominance of cross-sectional designs, and limited intervention research beyond the individual level (Pearl & Puhl, 2018; Puhl & Brownell, 2006). This narrative review pursues three objectives: 1) to characterise manifestations and global prevalence of weight stigma; 2) to examine psychosocial, developmental, and biopsychosocial mechanisms linking stigma to adverse outcomes; and 3) to evaluate evidence-based interventions across individual, family, school, community, and policy levels, with attention to China and other developing contexts.

## 2. Manifestations and Global Prevalence of Weight Stigma in Children and Adolescents

Weight stigma in pediatric populations manifests across interpersonal, institutional, self-directed, and digital domains. These dimensions and their global distribution is essential for designing targeted interventions.

### 2.1. Multidimensional Manifestations of Weight Stigma

1) Interpersonal level: Children with obesity are frequent targets of weight-related teasing, bullying, and social exclusion from peers (Puhl & King, 2013). Weight is consistently the most common reason for school bullying (Pont et al., 2017; Puhl & King, 2013). Parents and teachers may inadvertently perpetuate stigma through critical comments and weight-focused conversations, often unaware of the harm caused (Pont et al., 2017).

2) Institutional level: Weight stigma is embedded in policies of schools and healthcare systems. Practices such as public BMI screening, fitness testing, and weight-based seating disadvantage students with obesity (Puhl & King, 2013). Healthcare providers exhibit weight bias through shorter visits and less patient-centered communication (Pont et al., 2017). Employment discrimination based on weight has also been documented (Puhl & King, 2013).

3) Self-directed level (internalized stigma): Internalized weight bias (IWB) involves self-blame, body shame, and self-criticism related to one's body size (Rozzell-Voss et al., 2024). The Modified Weight Bias Internalization Scale (WBIS-M) shows that IWB predicts poorer mental health, disordered eating, and reduced quality of life (Rozzell-Voss et al., 2024). This self-stigma often persists even when external victimization diminishes.

4) Digital level: Social media algorithms amplify thin-ideal content ("fitspiration", weight-loss challenges, altered images), fostering appearance comparison and body shame (Mazzeo et al., 2024; Revranche et al., 2022). A systematic review found robust associations between social networking site use and negative body image, mediated by thin-ideal internalization and peer feedback (Revranche et al., 2022). Online weight-based bullying and algorithmic bias (e.g., targeted weight-loss ads) constitute digital stigma (Mazzeo et al., 2024). In China, platforms like Douyin and Xiaohongshu promote extreme thinness (e.g., "A4 waist" challenges), amplifying body anxiety among adolescents (Revranche et al., 2022). **Table 1** summarizes these manifestations.

**Table 1.** Multidimensional manifestations of weight stigma.

Level	Manifestations	Examples
Interpersonal	Peer bullying, parental/teacher critical comments	Name-calling, exclusion, weight-focused conversations
Institutional	Discrimination in education, healthcare, employment	BMI screening, short medical visits, hiring bias
Self-directed	Internalized bias, body shame, self-criticism	Self-blame, worthlessness, believing stereotypes
Digital	Thin-ideal content, cyberbullying, algorithmic bias	"Fitspiration" posts, body shaming, targeted ads

## 2.2. Global Prevalence and Population Disparities

1) Global prevalence range: Weight stigma affects 40% - 75% of adolescents with overweight/obesity, with rates exceeding 80% in clinical samples when subtle forms are included (Puhl & Lessard, 2020).

2) Regional differences: Prevalence is higher in Western countries with strong thin-ideal norms (Puhl & Lessard, 2020). However, rates are rising rapidly in East Asia (China, Japan, South Korea) as globalization and social media spread Western beauty standards (Puhl & Lessard, 2020; Revranche et al., 2022). Traditional cultural values may have historically suppressed overt comments, but social media

has accelerated body dissatisfaction in the region (Revranche et al., 2022).

3) Population disparities: Gender represents one of the most consistent moderators: girls report higher rates of weight stigma, greater body dissatisfaction, and more severe internalization than boys, reflecting disproportionate societal pressure on female appearance (Bucchianeri et al., 2013; He et al., 2020; Puhl & Lessard, 2020). A 10-year longitudinal study demonstrated that body dissatisfaction increases from middle school through young adulthood, with girls showing steeper trajectories (Bucchianeri et al., 2013). Age also moderates exposure: weight stigma prevalence peaks during early adolescence (ages 11 - 15), coinciding with heightened self-consciousness, pubertal changes, and increased sensitivity to peer evaluation (Puhl & Lessard, 2020). Lower socioeconomic status is associated with elevated stigma exposure, reflecting both higher baseline obesity rates in disadvantaged populations and compounded stigma based on weight and poverty (Puhl & Lessard, 2020).

4) Chinese adolescent data: Body image dissatisfaction is widespread among Chinese youth. A study of children aged 8 - 15 years found significant correlations between body dissatisfaction and aggressive behavior, with distinct pathways across pubertal stages (He et al., 2020). Although precise stigma prevalence data are limited, many Chinese adolescents—especially girls—report dissatisfaction and weight-loss intentions even at normal BMI (He et al., 2020). Over 95% of Chinese youth use social media daily, and algorithmic amplification of thin-ideal imagery intensifies these concerns (Revranche et al., 2022). **Table 2** summarizes global prevalence and key population disparities.

**Table 2.** Global prevalence and population disparities in weight stigma.

Parameter	Estimate/Pattern
Global prevalence among youth with obesity	40% - 75% report victimization
Regional pattern	Higher in West; rapidly rising in East Asia
Gender disparity	Girls > boys (prevalence, severity, internalization)
Age pattern	Peaks at 11 - 15 years
Socioeconomic status	Higher in lower-SES groups
Chinese adolescents	Elevated body dissatisfaction; limited stigma prevalence data

### 3. The Impact of Weight Stigma on Psychosocial Development

Weight stigma profoundly affects the psychosocial development of youth with obesity, with consequences spanning psychological, social, and behavioral domains that often persist into adulthood. This section synthesizes evidence from systematic reviews, longitudinal studies, and diverse cultural contexts, including China.

### 3.1. Psychological Outcomes

1) Emotional disorders: Weight stigma consistently predicts elevated depression and anxiety. A systematic review found significant associations between internalized weight bias (IWB) and depressive symptoms and generalized anxiety (Butt et al., 2023). Longitudinal evidence from Chinese adolescents confirms bidirectional relationships: IWB predicts subsequent psychological distress, which in turn predicts increased IWB, creating a self-reinforcing cycle (Barnhart et al., 2023)

2) Body image disturbances, self-esteem deficits, and eating disorders: Weight stigma attacks the developing self-concept, producing body shame and diminished self-worth. Critically, weight self-stigma (WSS) is a stronger longitudinal predictor of binge eating than body dissatisfaction itself: baseline WSS predicted binge eating at eight-month follow-up, whereas body dissatisfaction did not (Patarinski et al., 2025). This effect was pronounced among higher-weight individuals, where IWB mediated the experienced stigma-binge eating relationship (Keast et al., 2023). Weight-based victimization is also associated with suicidal ideation, and weight discrimination links to a near 60% increased mortality risk (Puhl & Lessard, 2020; Sutin et al., 2015). Notably, positive family factors do not fully offset stigma's effects on disordered eating, underscoring stigma's potency (Hooper et al., 2023).

3) Cognitive impairment: Chronic stigma-related stress activates the HPA axis, elevating cortisol and impairing attention, memory, and executive function—pathways that may diminish academic performance, though direct paediatric research is needed (Hughes et al., 2025).

4) Chinese adolescents, new media, and eating disorders: In China, social media amplifies body concerns. A prospective study of 1549 Chinese adolescents found bidirectional relationships between IWB and body dissatisfaction, disordered eating, and psychosocial impairment (Barnhart et al., 2023). Media literacy training and body-positive interventions may mitigate these harms (Mazzeo et al., 2024). **Table 3** summarizes key psychological outcomes.

**Table 3.** Psychological outcomes associated with weight stigma.

Outcome domain	Key findings
Depression & anxiety	Consistent associations between IWB and depressive symptoms, anxiety, psychological distress
Binge eating	Weight self-stigma predicts binge eating longitudinally; mediates experienced stigma→binge eating in higher-weight individuals
Body dissatisfaction	Bidirectional relationship with IWB; directly associated with IWB across weight status
Suicidal ideation & mortality	Weight-based victimization associated with suicidal ideation; weight discrimination linked to increased mortality risk
Chinese youth	Bidirectional relationships between IWB and psychosocial impairment, disordered eating

### 3.2. Social and Behavioral Outcomes

1) Social functioning impairment: IWB is significantly associated with impaired social functioning, including social withdrawal, loneliness, and poor peer relationships (Butt et al., 2023). Youth avoid physical education and school activities to escape stigmatization, limiting social skill development and supportive peer networks (Puhl et al., 2020; Puhl & Lessard, 2020).

2) Unhealthy and risky behaviors: Weight stigma paradoxically promotes maladaptive coping. It is linked to binge eating, emotional eating, dietary restraint, and lower physical activity (Puhl et al., 2020; Puhl & Lessard, 2020; Vartanian & Porter, 2016). These patterns are pronounced among youth who internalize stigma (Keast et al., 2023; Patarinski et al., 2025). Additionally, weight-based victimization is associated with elevated substance use (alcohol, tobacco) as an alternative coping mechanism (Puhl & Lessard, 2020).

3) Long-term social adaptation difficulties: Weight-related bullying predicts school avoidance and reduced academic engagement; yet only 6.7% of school anti-bullying policies explicitly mention weight (Hughes et al., 2025). In adulthood, weight discrimination is associated with lower educational attainment, reduced employment opportunities, wage penalties, and impaired intimate relationships (Hatzenbuehler et al., 2013; Puhl et al., 2020). As a fundamental cause of health inequalities, weight stigma disrupts resources, social relationships, and coping across the life course (Hatzenbuehler et al., 2013).

Weight stigma is a potent risk factor for adverse psychological, social, and behavioral outcomes. Bidirectional IWB—psychosocial impairment relationships (Barnhart et al., 2023; Keast et al., 2023), the predictive value of WSS for disordered eating (Patarinski et al., 2025), and limited buffering by positive family environments (Hooper et al., 2023) underscore the need for early, multi-level interventions. The next section examines core mechanisms underlying these effects.

## 4. Core Mechanisms Linking Weight Stigma to Psychosocial Outcomes

### 4.1. Psychosocial Mechanisms

Stereotype threat refers to the risk of confirming a negative stereotype about one's social group, generating anxiety and cognitive load that impair performance (Steele & Aronson, 1995). For youth with obesity, stereotype threat creates a self-fulfilling prophecy: expecting negative judgment leads to behaviors that confirm the stereotype, reinforcing both external bias and internalized shame (Major & O'Brien, 2005).

Social rejection theory posits that humans have a fundamental need for belonging (Baumeister & Leary, 1995). Chronic weight-based rejection-through teasing, exclusion, or bullying-deprives this need, triggering stress responses and maladaptive coping. Anticipated rejection leads to social withdrawal, reinforcing isolation (Major & O'Brien, 2005).

Social learning theory explains how children acquire stigmatizing attitudes

through observing peers, family, and media (Rosenstock et al., 1988). Vicarious learning normalizes weight bias, such that even youth who are not direct targets may internalize and perpetuate stigma.

Tripartite influence model identifies media, peers, and family as key sources transmitting thin-ideal standards through pressure and internalization, leading to body dissatisfaction and eating disturbance (Shroff & Thompson, 2006). In Chinese populations, sociocultural pressures from these sources predict lower body esteem and disordered eating, with acculturative stress amplifying effects (Gale et al., 2014).

## 4.2. Developmental Mechanisms

1) Adolescent vulnerability: Pubertal changes, abstract reasoning, heightened self-consciousness, and identity formation converge during adolescence, making youth exceptionally sensitive to social evaluation and rejection (Casey et al., 2008; Steinberg, 2005).

2) Prefrontal cortex immaturity: Ongoing development of prefrontal executive functions, combined with heightened limbic reactivity, impairs emotion regulation under stress (Casey et al., 2008). Adolescents show nonlinear recruitment of socioaffective circuitry when processing social evaluation, increasing vulnerability to weight stigma (Somerville, 2013).

3) Family and social support as moderators: Supportive family environments buffer weight stigma effects, whereas critical family weight talk and teasing exacerbate harm (Neumark-Sztainer et al., 2010). Negative maternal comments consistently predict disordered eating, mediated by body dissatisfaction (Chng & Fassnacht, 2016). In Chinese contexts, intergenerational differences in weight attitudes and acculturative stress shape family dynamics around body image (Wang et al., 2026).

## 4.3. Biopsychosocial Mechanisms

1) Biological level: Weight stigma activates the HPA axis, elevating cortisol and promoting neuroendocrine dysregulation (Tomiyama et al., 2018). Approximately half of studies report positive associations between weight discrimination and cortisol output (Kalantzis et al., 2025). Chronic cortisol elevation impairs cognition, increases abdominal fat deposition, and drives obesogenic eating behaviors (Tomiyama et al., 2018). Context matters: peer and cumulative discrimination are linked to altered diurnal cortisol patterns in adolescents with overweight/obesity (Emlaw et al., 2023).

2) Psychological level: Internalized weight bias and body shame serve as key mediators linking stigma exposure to depression, anxiety, eating disorders, and diminished self-esteem (Major & O'Brien, 2005). Cognitive appraisals (self-blame vs. external attribution) and emotion regulation strategies (adaptive vs. maladaptive) determine whether stigma leads to transient distress or persistent psychopathology.

3) Social level: Cultural norms equating thinness with virtue provide ideological foundations for weight stigma (Tomiyama et al., 2018). In rapidly changing societies

like China, traditional attitudes coexist with Western thin ideals, creating fluid cultural contexts. Peer and family dynamics moderate stigma's impact, as articulated in the tripartite influence model (Shroff & Thompson, 2006; Wang et al., 2026).

Integrative summary:

Weight stigma affects youth through interacting biological (HPA axis/cortisol), psychological (internalization, shame), and social (cultural norms, family/peer dynamics) pathways. Effective interventions must address all three levels simultaneously.

## 5. Evidence-Based Interventions and Public Health Strategies

Addressing weight stigma in children and adolescents requires a multi-level approach that targets individuals, families, schools, communities, and broader policy environments. This section synthesises evidence on interventions across these ecological levels, drawing on systematic reviews, randomised controlled trials, and position statements from authoritative bodies.

### 5.1. Individual-Level Interventions

Individual-level interventions focus on modifying psychological processes that perpetuate internalised weight stigma and its adverse consequences. Three main approaches have received empirical support: evidence-based psychotherapies, skills training, and body positivity programmes.

1) Psychological therapies: Cognitive-behavioural therapy (CBT) remains the most extensively studied intervention for weight bias internalisation (WBI). A systematic review by Pearl and Puhl (Pearl & Puhl, 2018) identified 74 studies examining WBI and health, demonstrating strong, negative relationships between WBI and mental health outcomes. CBT techniques—including cognitive restructuring to challenge internalised weight stereotypes and behavioural activation to reduce avoidance—have shown efficacy in reducing stigma-related distress. Acceptance and commitment therapy (ACT) offers an alternative paradigm, emphasising psychological flexibility rather than symptom reduction. The Mind & Life randomised controlled trial protocol evaluates an ACT and mindfulness-based group intervention for individuals with overweight or obesity, targeting weight self-stigma and quality of life (Iturbe et al., 2021). Compassion-focused therapy (CFT) specifically addresses the shame and self-criticism that accompany internalised weight stigma. Gale and colleagues demonstrated significant improvements in eating disorder symptomatology following integration of CFT into standard treatment programmes, with 73% of participants with bulimia nervosa achieving clinically reliable improvement (Gale et al., 2014). The National Institute for Health and Care Excellence (NICE) evidence review confirms that compassion-focused therapy, ACT, and CBT are effective psychological approaches for addressing weight stigma across age groups (NICE Evidence Reviews Collection, 2025).

2) Body positivity and media literacy programme: Interventions aimed at promoting positive body image and challenging thin-ideal internalisation have shown promise, particularly in adolescent populations. A systematic review by Guest and colleagues evaluated 12 interventions for children and adolescents aged 9 - 18 years, finding that cognitive dissonance-based approaches, peer support, and psychoeducation improved body appreciation and body esteem in adolescent girls (Guest et al., 2022). School-based media literacy interventions have demonstrated significant effects on both media literacy and body dissatisfaction reduction, with meta-analytic evidence showing that interventions using cognitive dissonance induction were most effective (Kurz et al., 2022).

3) Skills training: Although less rigorously evaluated than psychotherapeutic approaches, skills training programmes—including social skills training to navigate stigmatising situations, stress management techniques, and anti-bullying response strategies—are often embedded within broader interventions. These components help youth develop adaptive coping mechanisms to mitigate the impact of weight-related victimisation.

## 5.2. Family-Level Interventions

Families are both potential sources of weight stigma and critical buffers against its effects. Family-level interventions therefore target parent-child communication patterns and family dynamics.

1) Parent education: The European Childhood Obesity Group (ECOG) position statement on parental communication emphasises that parents need support and skill building to provide a healthy, accepting communication environment (Puhl et al., 2026). Key recommendations include focusing on health rather than weight, building family strengths, asking youth about preferred language to discuss weight, and acknowledging the multifactorial causes of obesity. A universal weight stigma intervention delivered to parents significantly improved the quality of parent-adolescent conversations about weight, with intervention group participants showing 28% less stigmatising content at 3 months and 24% less at 6 months compared to controls (Rancaño et al., 2025). This intervention holds promise as a scalable strategy to reduce family-based weight stigma.

2) Family-based treatment (FBT): Family-based behavioural treatment for childhood obesity has been successfully implemented in paediatric primary care settings. A large randomised clinical trial (n = 452) by Epstein and colleagues demonstrated that FBT produced superior weight outcomes at 24 months compared to usual care, with benefits extending to non-treated siblings and parents (Epstein et al., 2023). However, ECOG has issued a position statement highlighting the risk of intra-familial stigmatisation within family-based treatment (Hoeeg et al., 2025). The statement notes that while much attention has been paid to societal and peer-related weight stigma, less focus has been placed on how stigma manifests within families during treatment. Recommendations include attending to family dynamics, supporting parents in changing their own habits, and involving

siblings and extended family members to ensure truly family-focused, person-centred intervention.

### 5.3. School and Community-Level Interventions

Schools represent pivotal environments for weight stigma intervention, given that weight is the most common reason for bullying victimisation among youth.

1) School-based interventions: Three policy strategies have been identified to mitigate weight stigma in schools: adopting weight-neutral approaches in nutrition and physical education, implementing equitable screening and referral for eating disorders, and de-implementing BMI screenings (Turner & D'Arpino, 2025). Removal of BMI screenings emerges as the most impactful and feasible approach, given its association with increased body dissatisfaction and limited efficacy in improving health outcomes. However, a review of school anti-bullying policies in southwest England found that only 6.7% of policies explicitly mentioned weight-related bullying, despite weight being the most common target (Hughes et al., 2025). Youth perspectives support the inclusion of weight-related bullying in school policies, with 68.5% of respondents endorsing this approach (Kale et al., 2025). A school-based intervention programme delivered to Italian adolescents ( $n = 539$ ) demonstrated significant reductions in internalised weight bias among students who perceived themselves as overweight, with cognitive dissonance-based psychoeducational content showing promise (Mazzeo et al., 2024).

2) Community-level interventions: Community-based strategies include anti-stigma public awareness campaigns, inclusive physical activity programmes designed for diverse body sizes, support groups for youth with obesity, and community partnerships with healthcare providers and youth-serving organisations. While rigorous evaluation of community-level interventions remains limited, these approaches leverage natural social networks to amplify anti-stigma messaging and provide safe, affirming spaces for affected youth.

### 5.4. Public Health and Policy Interventions

Public health and policy interventions address the structural and cultural determinants of weight stigma at the societal level.

1) Media literacy and regulation: Social media plays a dual role in weight stigma: biased algorithms may concentrate exposure to thin-ideal content and facilitate online attacks, yet movements such as Body Positivity and Health at Every Size have created inclusive counter-spaces (Clark et al., 2021). Public health solutions include government exploration of anti-weight discrimination policies, platform investment in diverse content moderation teams with weight bias training, and clinician awareness of stigmatising online content.

2) Healthcare system reform: Weight stigma remains prevalent in healthcare settings, with physicians explicitly reporting negative attitudes about individuals of higher body weight. A call to action by Olson and colleagues argues that medical school represents a unique period to impact physician training (Olson et al.,

2025), recommending critical interrogation of how body weight is positioned within curricula, identification of embedded weight stigma, and development of training that produces physicians equipped to deliver inclusive care for all body sizes.

3) Policy interventions: Legal protections against weight discrimination remain limited globally. In Canada, weight is not a protected identity in human rights legislation, and an environmental scan of case law found significant gaps in identifying and correcting instances of weight discrimination (Nutter et al., 2025). The authors argue that weight ought to be a bona fide human rights issue, independent from disability protections. Public health scholars emphasise that beyond obesity prevention legislation, professionals should advocate for legislation directly targeting weight-based discrimination (Puhl, 2025). This includes adopting weight-inclusive rather than weight-normative approaches in public health messaging, avoiding stigmatising language, and framing obesity as a complex, multifactorial condition rather than a matter of individual willpower.

The evidence base for weight stigma interventions has expanded substantially, with strongest support for individual-level psychological therapies and emerging evidence for family, school, and policy-level strategies. However, significant gaps remain, particularly in the scalability of interventions and their evaluation in diverse cultural contexts, including China. Future research must prioritise multi-level, culturally adapted interventions that address weight stigma as a structural, not merely individual, problem. **Table 4** provides an overview of evidence-based interventions across ecological levels, their target mechanisms, and key evidence sources.

**Table 4.** Evidence-based interventions for weight stigma in children and adolescents.

Level	Intervention Type	Key Strategies
Individual	Psychological therapy	CBT, ACT, CFT
Individual	Body positivity & media literacy	Cognitive dissonance, peer support, psychoeducation
Family	Parent education	Non-judgemental communication, modelling healthy behaviours
Family	Family-based treatment	Whole-family behavioural intervention
School	Policy & practice reform	Anti-bullying policies, weight-neutral curricula, de-implement BMI screening
School	Targeted programmes	Cognitive dissonance-based psychoeducation
Community	Awareness & support	Anti-stigma campaigns, inclusive physical activity, support groups
Public health/Policy	Media regulation	Algorithmic bias correction, content moderation
Public health/Policy	Healthcare reform	Provider training, curriculum change
Public health/Policy	Anti-discrimination legislation	Legal protection for weight as a protected category

## 6. Current Research Gaps and Future Directions

### 6.1. Key Research Gaps

Despite substantial advances, several critical research gaps persist in understanding weight stigma among youth.

1) Study design limitations: Most existing research relies on cross-sectional designs, precluding causal inference (Nutter et al., 2024). The COBWEBS model proposes bidirectional feedback loops between weight stigma and weight gain, but rigorous longitudinal testing remains limited (Tomiyama, 2014).

2) Geographic imbalance: Research has concentrated in Western high-income countries, with samples predominantly comprising higher-weight White women (Nutter et al., 2024). There is a striking paucity of research from low- and middle-income countries and East Asian contexts, including China.

3) Lack of intersectional research: Weight stigma intersects with other forms of marginalization, including gender identity, race/ethnicity, and socioeconomic status. A study of Chinese gender-diverse adults found that weight bias internalization (WBI) uniquely predicted eating and body image disturbances even after controlling for gender minority stress (Barnhart et al., 2024). However, intersectional research in pediatric populations remains underdeveloped.

4) Intervention study limitations: A systematic review of 56 RCTs noted significant limitations: small samples, short follow-ups, predominant focus on individual-level interventions, and few assessing behavioral or health outcomes (Wang et al., 2025).

5) Biological mechanism gaps: While the HPA axis and cortisol are implicated, few pediatric studies have measured biomarkers (Tomiyama, 2014). Other potential mechanisms—*inflammation, epigenetic modifications, gut-brain axis*—remain largely unexplored (Puhl & Suh, 2015).

### 6.2. Future Research Directions

1) Longitudinal and cross-cultural research: Large-scale longitudinal studies are needed to enable causal inference and characterize developmental trajectories (Nutter et al., 2024). Cross-cultural research is urgently required to understand weight stigma in diverse contexts, including China (Barnhart et al., 2024).

2) Intersectional and biopsychosocial research: Future work should adopt intersectional frameworks and integrate biological markers (cortisol, inflammatory cytokines), psychological processes, and social factors (Tomiyama, 2014). Conceptual clarity distinguishing internalized weight stigma from body dissatisfaction is essential (Nutter et al., 2024).

3) Community- and policy-level intervention research: The evidence base must expand beyond individual-level approaches to include family, school, community, and policy strategies (Wang et al., 2025). Future RCTs should incorporate longer follow-ups, diverse samples, and behavioral endpoints. Digital interventions (app-based CBT/ACT, social media literacy) represent promising scalable approaches.

4) Participatory research with affected youth: Youth with lived experience

should be engaged in all research phases—from problem definition to intervention design—ensuring relevance and acceptability (Nutter et al., 2024; Wang et al., 2025).

5) Focus on Chinese and East Asian contexts: With approximately 19% of Chinese children aged 6 - 17 overweight or obese, and thin-ideal content proliferating on weight stigma in Chinese youth is urgently needed. Culturally adapted measures, digital interventions, and school- and family-based strategies tailored to Chinese contexts are priorities (Barnhart et al., 2024).

## 7. Conclusion

Weight stigma is a pervasive yet underrecognized driver of adverse psychosocial outcomes in children and adolescents with obesity, including depression, anxiety, eating disorders, social withdrawal, and cognitive impairment. These effects operate through a vicious cycle in which stigma-induced distress promotes maladaptive behaviors that exacerbate weight gain and further stigma exposure. Mediating mechanisms span psychosocial pathways (stereotype threat, social rejection), developmental vulnerabilities (adolescent neurocognitive immaturity), and biopsychological processes (HPA axis dysregulation).

Effective mitigation requires coordinated action across multiple levels: individual psychological interventions (CBT, ACT, compassion-focused therapy), family-based strategies (parent education, non-stigmatizing communication), school and community programs (anti-bullying policies, inclusive physical education, body image curricula), and public health policies (media literacy, healthcare reform, anti-discrimination legislation).

Future research must prioritize longitudinal and cross-cultural designs, intersectional frameworks, community- and policy-level interventions, and participatory engagement of affected youth. In contexts such as China, understanding digital weight stigma on local social media platforms and developing culturally adapted interventions is urgent. Weight stigma is not an acceptable cost of obesity prevention but a public health priority demanding direct, compassionate action.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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