

REVIEW OPEN ACCESS

Ethical Issues Raised by Interventions to Prevent or Treat Childhood Obesity: A Systematic Qualitative Review

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ABSTRACT

Background: Efforts to control the global obesity epidemic are increasingly focusing on preventing childhood obesity. A wide range of interventions has been implemented; however, such interventions raise important ethical issues.

Aim: This study aims to determine systematically the spectrum of ethical issues that are raised by interventions to prevent or treat childhood obesity.

Methods: A systematic review in PubMed was conducted for publications describing and/or assessing ethical issues raised by childhood obesity interventions. Data were analyzed and synthesized using qualitative content analysis.

Results: Our literature search retrieved 4637 publications of which 62 were included in the final analysis. When the ethical issues presented by the 11 different types of childhood obesity interventions were identified, it is clear that the discussion of ethical issues regarding interventions to prevent or treat childhood obesity has important gaps. However, two key overarching themes emerged across the different interventions: a lack of evidence of effectiveness and risk of harmful side effects.

Conclusion: The obesity epidemic is a growing, yet largely neglected, global public health crisis. Despite there being an ethical obligation to address this crisis, it is ethically problematic that efforts to reduce childhood obesity rates have primarily focused on individual behavior. Evidence demonstrates that these lifestyle interventions are not only largely ineffective but also cause harm. A fundamental shift towards more system-level actions is needed.

1 | Introduction

Obesity is a chronic complex disease defined by excessive fat deposits that can impair health. Once associated only with high-income countries, the increasing prevalence of obesity is a fast-globalizing problem. The worldwide prevalence of obesity more than doubled between 1990 and 2022, with over 890 million adults living with obesity in 2022 [1]. The rise has also occurred among children and adolescents. In 1990, 31 million children and adolescents aged 5–19 were living with obesity; by 2022, 160 million young people were living with obesity [1]. The consequences of obesity are significant. It is estimated that there were 5 million deaths in

2019 from noncommunicable diseases caused by obesity [2], and it is predicted that the global costs of obesity will reach 3 trillion US dollars per year by 2030 and more than 18 trillion by 2060 [3]. Having obesity during childhood is associated with an increased risk of several diseases, including cardiovascular disease, cancer, and diabetes, and developing them at a younger age, though they often do not become apparent until adulthood [4]. Children living with obesity also often experience negative psychosocial consequences such as stigma, discrimination, and bullying; it affects school performance and quality of life [5]. Evidence also indicates that children with obesity are more likely to become adults with obesity and that the prevention and nonsurgical treatment of

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obesity works better at young ages than during adulthood. Efforts to control the global obesity epidemic are, therefore, increasingly focusing on preventing childhood obesity to “cut the roots” of the epidemic [6]. Strategies include societal policy interventions such as introducing a higher tax on unhealthy foods and limiting fast food advertising, lifestyle interventions such as weight monitoring and exercise programs, and individual medical treatments such as weight loss drugs or bariatric surgery.

However, such interventions raise important ethical issues. In 2011, Ten Have et al. published a helpful “inventory” of ethical issues regarding interventions or policies to prevent overweight and obesity [7]. Problematic ethical aspects included: uncertain or unfavorable effects on physical health; negative psychosocial consequences (e.g., uncertainty, fears, blaming, stigmatization, and discrimination); increased inequalities; inadequate information; disregarding the social and cultural value of eating; disrespecting privacy; disregarding the complexity of responsibilities; and infringement on personal freedom. In 2017, Hurlimann et al. conducted a review of ethical issues in the development and implementation of nutrition-related public health policies and interventions [8]. With regard to obesity specially, ethical issues identified included the ethical acceptability of food marketing to children, improving labeling to promote individual responsibility; restricting consumer choice and the risk of exacerbating socioeconomic inequalities through food bans and food taxes; concerns that interventions aimed at promoting access to healthy foods risked excessive paternalism, stigmatization, and infringing individual autonomy. The review also highlighted broader ethical issues including the unintended effects of obesity interventions, such as how it is necessary to consider the social determinants of obesity, the need to address underlying social inequities and the risk of obesity prevention policies increasing existing health disparities, and the balance between individual and collective responsibility. In one of the only reviews focusing on childhood obesity to date, Kahrass et al. conducted a review of ethical issues in obesity prevention for school children in 2017 [9]. Ethical risks and challenges were deductively categorized along six principles: (1) benefit, including the risk of ineffective approaches, the challenge of a bad evidence-base of preventive measures, and the challenge of having the right balance between short-term and long-term targeted interventions; (2) harm, including the risk of unintended effects and harms of preventive measures, the risk of stigmatization and discrimination, and the risk of overestimating personal responsibility; (3) efficacy/cost, including the challenges of dealing with the lack of efficiency of preventive measures; (4) justice, including the challenges of adequately taking underprivileged children into account, and the risk of reinforcing inequality; (5) autonomy, including the challenges to ensure informed choices and voluntariness in preventive measures, and challenges to recognize the limits of personal responsibility; and (6) legitimacy, including the risk of neglecting the social context of obesity, risk of undermining public support for preventive measures, and the risk of overestimating personal/parental responsibility.

This rationale for this review is threefold. First, prior reviews from Ten Have et al. [7] and Hurlimann et al. [8] focused on ethical aspects of obesity-related interventions in general or on nutrition-related policies specifically—not on interventions directed at children. Kahrass et al. [9] did focus on interventions directed at children but narrowed it down to school children

and preventative interventions. Therefore, treatment of childhood obesity or interventions for children outside of school have not yet been covered in the literature. Second, these prior reviews only covered literature up to 2015 (Ten Have et al. [7] up to 2011). In the last decade, however, new interventions have been introduced and studied. Third, in these prior reviews, the ethical issues were also typically not split out for different types of interventions, which makes it difficult for the readers to find out what ethical issues typically come up when implementing a particular intervention. An up-to-date overview of the ethical issues raised by interventions to prevent or treat childhood obesity can assist in well-considered decision and policy making with regard to efforts to reduce childhood obesity. Systematic qualitative literature reviews allow for a structured and methodologically informed identification and synthesis of the relevant literature regarding a specific topic [10]. This systematic qualitative review aims to determine systematically the spectrum of ethical issues that are raised by childhood obesity interventions. This review follows a purely descriptive approach, which means that it does not evaluate or rank the identified issues.

2 | Methods

The methods of the study are presented in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) as far as they are applicable to qualitative analysis [11].

2.1 | Inclusion Criteria

To be included, publications had to describe and/or assess ethical issues raised by interventions to prevent or treat obesity or being overweight in childhood. The definition of ethical issues was based on principlism [12], which has been successfully used in other systematic qualitative ethics reviews [10, 13–17]. It was assumed that an ethical issue arises when (1) one or more ethical principles have been neglected or (2) because of conflicts between two or more ethical principles. Interventions to prevent or treat obesity or being overweight during childhood are defined as any governmental or professionally organized effort, policy, or program intended to prevent or treat obesity in children under 18 years old. Interventions had to be focused specifically on childhood obesity rather than on obesity in general. Because of the composition of our research team, only publications in English, Italian, French, Spanish, or German were included. Furthermore, publications needed to be research articles and commentaries published until September 30, 2023. The methodological quality, beyond the fact that the paper was identified in scientific databases and published in peer-reviewed journals, did not serve as a criterion of eligibility, as the quality of a publication was irrelevant for the purpose of identifying the spectrum of ethical issues discussed in the literature.

2.2 | Search Strategy and Data Sources

The search terms were developed through an iterative process, where combinations of key words and MeSH terms were piloted in PubMed and the results were assessed for inclusion

of a known set of representative literature. This resulting combination of key words and MeSH terms included in the search strategy (see Table S1).

2.3 | Study Selection

Based on the inclusion criteria, all titles and abstracts were independently screened to assess their eligibility for inclusion for full text screening to insure inter-rater validity. Further publications were identified by screening the reference lists of the included publications. In case of disagreement, consensus was reached discursively. Full texts of potentially eligible studies were then screened. Any discrepancies between reviewers during the screening process with regard to the inclusion/exclusion of articles were resolved by consensus. The steps of study selection and number of articles included in each are shown in Figure 1.

2.4 | Data Analysis and Synthesis

Included full texts were analyzed using conventional inductive qualitative content analysis. Interventions were categorized as either being on the individual, community, or societal level. Individual level interventions included those that involve

individualized education, advice, counseling, or treatment. Community-level interventions were defined as group-based education, advice, or counseling, or activities conducted in a community setting. Societal-level interventions include those that involve a change in the environment or macro-level policies [18]. Interventions were further categorized as being preventative (primary, secondary, and tertiary), therapeutic, and public health and system interventions. Ethical issues were categorized using principlism: (1) well-being (beneficence), (2) harm (non-maleficence), (3) autonomy, and (4) justice. Additional subcategories were inductively identified from the data. Furthermore, the issue of ethical uncertainty was added as a category due to it being such a prominent issue raised in the reviewed literature. Five articles were purposefully selected for reading and coding to identify inductively as many ethical issues as possible, which were compared and publications and a preliminary coding framework constructed using the qualitative data analysis software MAXQDA. The draft framework was discussed during regular meetings with the research team to increase validity and reliability. For the next five publications, relevant quotes were extracted, and it was checked whether the existing coding framework already described the relevant issues and introduced new categories where necessary. The remaining publications were then analyzed applying the defined categories and introducing new ones if necessary. Further in-person meetings with co-authors

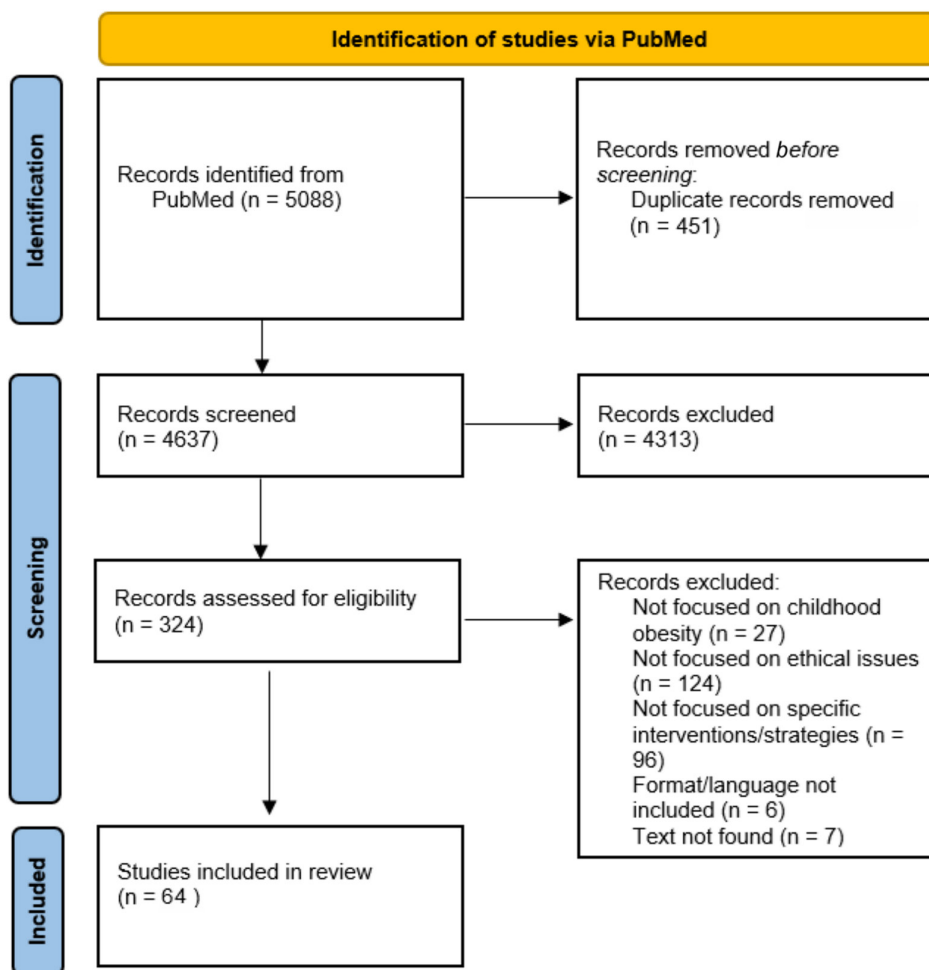


FIGURE 1 | PRISMA flowchart.

were convened to help resolve any remaining coding problems, and to discuss the framework's consistency and comprehensibility until all authors agree upon the final matrix of ethical issues.

3 | Results

3.1 | Characteristics of Included Papers

Our literature search retrieved 4637 publications of which 62 were included in the final analysis (Figure 1). Of the included publications, 46.8% (30/62) came from North America, 45.3% (29/62) came from Europe, and 7.8% (5/62) from Oceania. Article types included ethical analysis ($n=27$), empirical research ($n=22$), literature reviews ($n=7$), legal analysis ($n=4$), guidelines/consensus statements ($n=3$), cost-effectiveness studies ($n=2$), and a letter to the editor (see Table S2).

3.2 | Identified Interventions and Associated Ethical Issues

A total of 11 different types of childhood obesity were identified in the included publications. The associated ethical issues of each type of childhood obesity intervention are described below (see Table 1 and Table 2 for an overview of the interventions and associated ethical issues).

3.3 | Individual and Community Level

3.3.1 | Preventative Interventions (Primary, Secondary, Tertiary)

1. Predictive tests (primary): genetic or nongenetic tests to predict an infant's risk of developing obesity, based on biological and/or social factors [19, 20]. Predictive tests were seen to have a role promoting *well-being* through appropriate and timely action; however, various ethical risks were identified. *Harm*: the risk of harm via malnourishment or enhanced obesity risk if behavioral risk factors are not appropriately understood; and the risk of stigmatization and parental guilt in "causing" obesity predisposition. *Autonomy*: the risk of parents' autonomy being undermined by an inability to appropriately understand and action predictive information; and the risk of individual de-responsibilization as a consequence of an over-focus on the genetic component of obesity. *Justice*: the risk of financial costs and the coverage of genetic tests being unfairly distributed; and the risk of inequalities being widened because predisposition reduction measures being unaffordable or inaccessible to economically disadvantaged families. *Uncertainty*: uncertainty that predictive information is accurate (false positives or false negatives) and actionable.
2. Diet and exercise (primary and secondary): multi-faceted individual, family, or school targeted programs and regulations to improve children's nutrition and increase their physical activity [21–33]. Although diet and exercise this can increase *well-being* in successful cases, various ethical

risks were identified. *Harm*: the risk of psychological harm to children; and the risk of children involved in the programs being stigmatized. *Autonomy*: the risk of interference with freedom of choice of the child or the family; and the risk of focusing too much on individual responsibility rather than social determinants. *Justice*: the challenges around healthy food affordability and concerns about school unequal budgets to implement programs; and the risk of unequal financial burden for people in disadvantaged socio-economic conditions. *Uncertainty*: uncertainty about the effectiveness of diet or exercise against other social factors.

3. Anthropometric measurement (secondary): measuring children's bodies primarily in schools in relation to parameters associated with obesity or obesity risk [21, 34, 35]. It was thought that measurement could promote *wellbeing* by encouraging children and families to seek medical care and undertake positive behavioral changes, but various ethical risks were identified. *Harm*: the risk of reduced self-esteem and eating disorders ("counterproductive labelling") and the potential discrimination for the children with abnormal parameters; and the risk of stigmatization of children outside the parameters considered as normal. *Autonomy*: the risk of freedom of choice being undermined if the measurement is mandatory; the risk of inadequate responses if action is left to parents alone with no medical guidance; and the risk that the measurement and its communication may violate children's privacy and data protection. *Justice*: the risk that the financial costs may unfairly burden schools, and the risk that inequalities may be widened because not all schools have the budget to implement accurate measurement programs and that these programs may be ineffective in disadvantaged families who may fail to understand and act on the received information. *Uncertainty*: uncertainty that Body Mass Index (BMI) is an appropriate measure in children.
4. Counseling (secondary and tertiary): counseling concerning healthy nutrition and physical activity [36–41]. Ethical risks regarding counseling focused on issues of *justice*, including the risk that financial and time costs for families to participate is unfairly distributed; and the risk of unequal availability of counseling in deprived areas.
5. Monitoring devices (secondary and tertiary): wearable devices to measure intensity and frequency of physical activity and track behavioral changes [42]. Ethical risks regarding monitoring devices focused on the risk of wearable devices being visible and causing *harm* through stigmatization to the children wearing them.

3.3.2 | Therapeutic Interventions

6. Pharmaceuticals: weight loss drugs that suppress appetite and increase satiety by mimicking hormones, or prevent the absorption of dietary fat in the digestive tract by inhibiting the enzymes that break down fat [22–24]. Various ethical risks regarding the use of pharmaceuticals were identified. *Harm*: the risk of physical harm due to side effects. *Justice*: the risk of the intervention not being cost

TABLE 1 | Ethical issues for individual and community interventions.

Ethical issue	Interventions					
	Preventative interventions (primary, secondary and tertiary)			Therapeutic interventions		
	Predictive tests (primary)	Diet and exercise (primary and secondary)	Anthropometric measurement (secondary)	Counseling (secondary and tertiary)	Monitoring devices (secondary and tertiary)	Pharmaceutical
Well-being						
Harm						
Stigmatization						
Autonomy						
Individual responsibility						
Privacy and data protection						
Justice						
Inequalities						
Uncertainty						

TABLE 2 | Ethical issues for societal interventions.

Ethical issue	Public health and system-level interventions		
	Advertising regulation	Taxes and subsidies	Health and nutrition information
Well-being			
Harm			
Stigmatization			
Autonomy			
Individual responsibility			
Justice			
Inequalities			
Uncertainty			

effective due to high financial costs; and the risk of societal inequalities being widened because drugs are not affordable or prescribed to everyone. *Uncertainty*: concerns about uncertain or limited efficacy.

7. Surgery: bariatric surgery that reduces stomach size and/or alter the digestive tract to promote weight loss, when diet and exercise have failed to achieve sustainable weight loss, or when obesity-related health problems are severe [22–29, 43–49]. Although surgery could increase well-being with “the new body”, various ethical risks were identified. *Harm*: risk of physical harm due to side effects of surgery (e.g., unintentional bleeding); and the risk of stigmatization of the individuals who undergo surgery. *Autonomy*: the risk that children are unable to understand the long-term consequences and risks of surgery to provide informed consent. *Justice*: the risk that the cost coverage and the subsequent affordability of surgery is unequally distributed; and the risk of unequal accessibility for certain social groups (primarily ethnic minorities and marginalized groups) is restricted due to affordability. *Uncertainty*: the uncertainty caused by a lack of data on the effectiveness of surgery in children.
8. Removal from family: children being removed from their homes and placed in foster care to improve their lifestyle [48, 50]. Three ethical risks of removing children from their family were identified. *Harm*: the risk of psychological harm for children and families, which is disproportionate to the expected benefits. *Autonomy*: the risk of significant intrusion into family life. *Uncertainty*: the uncertain evidence of effectiveness.

3.4 | Societal Level

3.4.1 | Public Health and System Interventions

9. Advertising regulation: policies to regulate the advertising of food and beverages targeted to children [30, 31, 51]. The ethical risks of advertising regulation focused on the impact on industry. *Harm*: the risk of damage to industry profit. *Autonomy*: the risk of undermining industry freedom to advertise and sell their products as they find

more profitable. *Justice*: the risk of unfair financial loss to industry.

10. Taxes and subsidies: increasing taxes on unhealthy foods and beverages to disincentivize buying, and/or subsidies to incentivize buying healthy products [32, 33, 50, 52]. Ethical risks of taxes and subsidies focused on issue of justice and uncertainty. *Justice*: the risk of increased costs burden on buyers of unhealthy product irrespective of their health, and the risk of disproportionate burden on economically disadvantaged people. *Uncertainty*: unclear evidence that taxes and subsidies prevent or reduce obesity or unhealthy choices.
11. Health nutrition information: health nutrition information providing nutritional content or labeling to make it easier to assess the food [31, 52–54]. Ethical concerns raised regarding this intervention include *Harm*: concerns that education programs could contribute to stigmatization of obesity. *Autonomy*: concerns that education programs may foster state control over people attitude towards obesity, concerns that information campaigns may over-focus individual responsibility and lead to blame. *Justice*: concerns about the public costs of education programs given the uncertainty around their effectiveness, the information provided may not be actionable for many socioeconomically disadvantaged families without additional support. *Uncertainty*: uncertain how effective the education programs are.

4 | Discussion

This is one of the first systematic reviews of the spectrum of ethical issues that have been discussed in the literature about obesity interventions that are directed at (all) children. Although most of the general ethical issues identified in relation to childhood obesity interventions align with the ethical issues that have been identified by previous ethics reviews of interventions for general obesity and preventative interventions for school children [7–9], when ethical issues are presented by different types of childhood obesity interventions it is clear that the ethical issues currently discussed in the literature regarding childhood obesity interventions are incomplete and not exhaustive; many ethical issues in relation to certain

interventions are not discussed (e.g., “counseling” omits obvious concerns around autonomy and well-being). This indicates an important gap in the scientific literature that may undermine well-considered decision and policy making with regard to efforts to reduce childhood obesity. With regard to the ethical issues that were identified, two key overarching themes emerged across the different childhood obesity interventions: a lack of evidence of effectiveness and risk of harmful side effects.

It was repeatedly noted in the reviewed literature that many interventions to prevent or treat childhood obesity are clouded in uncertainty about their effectiveness [22, 23, 46, 53]. The use of these interventions despite the lack of evidence for their effectiveness was seen as ethically problematic [32, 53, 55]. A recently published review of barriers for decision makers in prioritizing interventions for obesity generally also identified uncertainty about the long-term consequences of obesity interventions and wider economic consequences as a key challenge [56]. Where evidence of effectiveness is unclear, a reasonable strategy to deal with this ethical challenge is to reduce this uncertainty by obtaining further evidence; and given the impact on children's lives, this is arguably an ethical duty [57]. However, there is currently a lack of consensus about what should count as effectiveness for such interventions. While some authors refer to effectiveness of childhood obesity interventions in terms of stabilizing or decreasing the number of children living with obesity, other interventions focus on improving overall wellbeing of children, partly through weight loss [39].

Furthermore, nine out of the identified 11 interventions were reported to carry a risk of causing harm themselves. The potential harmful side effects of childhood obesity interventions ranged from physical harm from surgery (e.g., around 8% of patients undergoing bariatric surgery require reoperation within 3 years because of leaking or bleeding) [23, 27, 28, 44] or weight-loss drugs (e.g., mineral deficiencies [22]) to psychological harm due to stigmatization [57]. The risk of some childhood obesity interventions potentially worsening inequalities was also raised in the reviewed literature [47, 58, 59]. Although there is a growing body of evidence that shows disparities in obesity among racial and ethnic minorities and individuals with a low socioeconomic status [60], research indicates that obesity interventions themselves do not increase inequalities [61, 62]. Nevertheless, there is an increasing view that certain interventions, particularly lifestyle interventions that focus on restricting an individual's energy intake and increasing their physical activity levels, may be doing more harm than good [63]. Such lifestyle interventions have been the key recommendation to reduce obesity rates, but robust evidence indicates that these lifestyle interventions are largely ineffective in providing sustained long-term weight loss, and the focus on weight loss contributes to weight bias and stigma [63]. Weight stigma was repeatedly identified in the reviewed literature as a pervasive problem for children, and lifestyle interventions in particular were reported to worsen it. Weight stigma is driven by beliefs that body size is easily in control of the individual and a matter of discipline and “not being lazy” [20]. It is experienced by children as well as their parents [64–68]. Stigma is known to worsen obesity by creating even more barriers for weight-loss and negatively impacting a child's self-image [66]. Children or their parents may even refuse to

participate in health programs because of fear of stigmatization and bullying [42, 69, 70] or avoid explicitly talking about obesity [64, 65].

The obesity epidemic is a growing, yet largely neglected, global public health crisis. The risk to public health of not addressing this crisis is potentially catastrophic; it is predicted that by 2035 around 25% of the world's population may be affected, and that by 2050 more than 50% of the global adult population may be living with obesity [71]. Obesity is associated with an alarming rise in non-communicable diseases, collectively contributing to over 5 million deaths annually [71]. Although a single main cause of obesity can be identified in a minority of patients (medications, diseases, monogenic disease/genetic syndrome), in most cases, obesity is a multifactorial disease due to obesogenic environments, psycho-social factors, and genetic variants.

Despite there being an ethical obligation to address this public health crisis, it is ethically problematic and a failure of health policy that efforts to reduce obesity rates have primarily focused to date on individual behavior, implying that obesity is a failure of will [51, 72]. Evidence demonstrates that these interventions are not only largely ineffective but are also creating harm. In response to this situation, a fundamental shift in strategy is being advocated towards more system-level actions [72]. Evidence on how to operationalize such a multisectoral systems approach is still in its infancy [73], and “must also be underpinned by political will, competence to manage the commercial determinants of health and conflicts of interest and investment” [72]. Recent research also highlights that policies focusing on improving neighborhood food environments will likely be most effective if combined with those addressing systemic issues related to family deprivation [74].

5 | Limitations

This review has a number of limitations that should be taken into account when interpreting the results. The search was only conducted on PubMed. However, this is the key database for journal articles in the biomedical literature and previous systematic reviews of bioethical issues have shown limited value of also searching other databases [75, 76]. It is also possible that not all interventions used to address obesity are included in the review because publications discussing these interventions did not meet the inclusion criteria of being specifically focused on childhood obesity and discussing ethical issues connected to the intervention. For instance, the association between built environments and urbanization and childhood obesity is well discussed in the literature [77–80], but environmental or urban planning measures are not included in the review. Furthermore, the literature search does not cover recent developments such as the application of artificial intelligence in the management of childhood obesity [81, 82], which may be due the developments being so recent that the associated ethical issues have not yet been discussed in the literature. All the included literature also only comes from North America, Europe, or Oceania, despite childhood obesity interventions also being implemented in non-Western countries [83, 84]. This means that ethical issues specific to non-Western countries

may not covered by this review. This could partly be the result from including only English, Italian, French, Spanish, and German literature and focusing on the academic rather than non-scientific literature. Systematic qualitative ethics reviews also involve a high level of interpretation, introducing a subjective element to the analysis. Nevertheless, as four authors were involved in reading and analyzing the literature and met regularly to discuss challenges with interpretations, this process should ensure as much as possible the reliability and validity of the findings.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Table S1:** Search Strategy in PubMed. **Table S2:** Included literature.