Int J Public Health (2017) 62:981–988
DOI 10.1007/s00038-017-1027-9

REVIEW

Ethical issues in obesity prevention for school children: a systematic qualitative review

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Received: 12 May 2017 / Revised: 22 July 2017 / Accepted: 29 July 2017 / Published online: 11 August 2017

Abstract
Objectives Planning and conducting preventive measures against obesity for school children is beset with ethical issues which should be known to make well-informed decisions. The goal of this study was to provide a comprehensive spectrum of these ethical issues by means of a systematic review. In this context, the study also assesses the value of different search strategies for ethical literature in public health.
Methods Literature was searched in Medline, EBSCO and others. Three different search strategies with varied scopes were applied and their output was compared. Qualitative content analysis was used for extracting and categorizing ethical issues.
Results 109 publications (published from 1995 to 2015) were finally included. The qualitative analysis resulted in 60 potentially relevant ethical issues. The three search strategies showed substantial differences regarding their search results.
Conclusions The presented spectrum provides an initial evidence base for dealing with ethical issues adequately. The findings of the study further suggest that a broader scope is more fruitful for systematic reviews on ethical issues in the field of public health.

Keywords Ethics · Ethical issues · Obesity prevention · School children · Systematic review

Introduction

Childhood obesity is a global public health problem (Caprio and Genel 2005; Ebbeling et al. 2002; Kelishadi et al. 2008; Misra et al. 2006; Wu et al. 2016; Zhang et al. 2017) that not only causes morbidity and mortality among children, but also increases the risk of obesity, cardiovascular diseases, diabetes mellitus, asthma, osteoarthritis, sleeping disorder, and many types of cancers in adulthood (Egan et al. 2013; Narang and Mathew 2012; Orgel et al. 2016; Park et al. 2012; Paulis et al. 2014; van Emmerik et al. 2012). In the WHO European Region about 20% of children suffer from obesity or being overweight (Ahrens et al. 2014). Similarly, the prevalence of obesity in the USA varies between 9% (2–5 years), 18% (6–11 years), and 21% (12–19 years) (Ogden et al. 2015).

Policies targeting the school environment can be considered a key strategy to address childhood obesity, as children spend a substantial amount of their time in school, and school resources and practices affect the availability of specific foods and beverages (e.g. Masse and de Niet 2013).

The measures taken against obesity often involve ethical challenges. On the one hand, there are obvious ethical reasons to nudge people towards a healthier lifestyle or to limit their freedom of action, such as improving individual and public health and reducing health care costs caused by obesity (e.g. Chaloupka 2011). On the other hand, the same

Electronic supplementary material The online version of this article (doi:10.1007/s00038-017-1027-9) contains supplementary material, which is available to authorized users.

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interventions to prevent obesity affect personal autonomy and might be unjust (e.g. Williams et al. 2014). Furthermore, even a well-intentioned intervention can cause harm through unintended health-related side effects (e.g. Ramos Salas 2015).

Conflicts between different ethical goals and unintended side effects can be caused by the intervention itself, for example, by increasing an existing stigma among school children of suffering from adiposity. But such conflicts can also originate from disease-specific factors. For example, the prevalence of obesity varies greatly among different subgroups of the population, with a higher incidence in families with low income (Flegal et al. 2010); this must be taken into consideration by an ethically sound, accountable prevention strategy.

ten Have et al. (2011) published a valuable 'inventory' of ethical issues based on the analysis of reported interventions and policy proposals. However, ten Have et al. could only include an ethical issue if it had occurred, was perceived, and was then reported. Additionally, some ethical issues may simply not arise when conducting an intervention. Such issues refer to more general questions in the context of national strategies on obesity, e.g. taking into account the social perspectives of the obesity epidemic or the general legitimacy of regulatory interventions against obesity. Therefore, it is important to be conscious of the fact that preventive measures against childhood obesity can affect individual, institutional and societal/political levels of decision-making in a health care system.

A core requirement for an ethically balanced approach to the prevention of obesity in school children is an unbiased and comprehensive account of all (discussed/reported) ethical issues at stake. Such an account, a full spectrum of ethical issues, can be based on a systematic literature review. Traditional reviews in medicine strive for a precise search, for example, based on the PICO scheme (*p*opulation/*p*atient, *i*ntervention, *c*omparison/*c*ontrol, and *o*utcome). However, to retrieve all relevant literature, such a search strategy requires comprehensively indexed article databases. For the ethics literature, such indexing does not yet exist (Droste 2008). Furthermore, traditional systematic reviews aim to reach definite conclusions, e.g. about drug efficacy. A systematic review of ethics literature, by contrast, analyses concepts, relations between norms and principles, and their practical implications (Mertz et al. 2016). Even for our relatively focused area of concern, therefore, literature addressing more general topics (e.g. "ethics of prevention" or "ethics of obesity care") can be important. Hence, the search strategy in our review was expanded to issues not explicitly related to obesity or childhood. However, as far as we know there has been no empirical investigation of the results of narrower and broader search strategies in regard to reviews of ethics literature.

This paper, therefore, has two aims: first, to provide an unbiased and comprehensive spectrum of possible ethical issues related to preventive measures for childhood obesity. The review is intended to be purely descriptive. We do not intend to judge the practical relevance of specific ethical issues, as this is a task for normative research projects and decision-makers in the health care system. Thus, the research question for the *review* was: *Which ethical issues regarding obesity prevention for school children can descriptively be identified in a) published literature that directly address obesity prevention for school children and b) published literature that not directly address obesity prevention for school children, but general ethical issues of obesity prevention and obesity in school children that are relevant and applicable to obesity prevention for school children?*

Given the lack of methodological best practice standards for such reviews, this paper additionally aimed to assess the effects of different scopes of search strategies on the basis of (a) results and (b) feasibility of search strategies and synthesis of results. So, a further research question for the *paper* is: *What is an adequate search strategy for finding ethical issues in public health-related topics?*

Methods

This review is based on three separate literature reviews (abbreviated "SR 1", "SR 2", and "SR 3"). This allows us to reflect the expediency of different search strategies with regard to the overarching aim of developing a full spectrum of specific ethical issues. The syntheses of the three reviews were merged into one meta-synthesis to form a comprehensive spectrum of ethical issues in the prevention of obesity in school children (Fig. 1). The first review followed the standard approach of HTA agencies. This review was developed in consultation with a specific HTA agency but for confidentiality reasons we cannot report details for this search algorithm. The other two reviews, a complementary pair, were based on a proven approach for reviewing ethics literature (Strech et al. 2013).

The search string for the first review (SR 1) was very close to the research question and had five search clusters: obesity, ethics, children, school, and prevention. The two others only had three clusters: obesity, ethics, and prevention (SR 2); and obesity, ethics, and children (SR 3). This was made to cover both intervention-specific and disease-specific ethical issues. SR 2 was not restricted to children because we suspected that ethical issues related to obesity prevention, in general, would probably be relevant

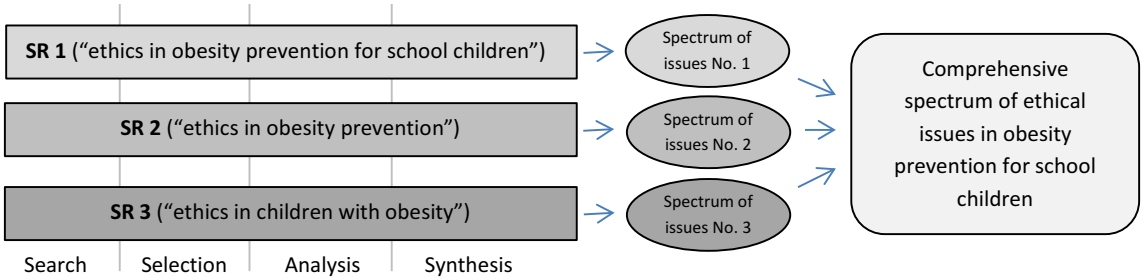

Fig. 1 General approach of the cumulative review

to obesity prevention in children. We included issues from the non-children-specific literature if both researchers (HK and MM) agreed.

Definition of "ethical issue"

We use the ethical approach called principlism (Beauchamp and Childress 2009) to define "ethical issue", which is the information unit extracted from the literature. Principlism is based on four "mid-range" principles: *beneficence*, *non-maleficence*, *respect for autonomy*, and *justice*; many ethical and medical professionalism frameworks (e.g. ABIM Foundation 2002) resonate with these principles as well. However, we expanded this approach by also taking the *efficiency* of a public health intervention and the *legitimacy* of the decision-making authority into account (Marckmann et al. 2015). Each principle entails obligations that are valid prima facie. This means that they must be followed in a particular case unless there is a conflict with another obligation that is of equal or greater weight. The principles themselves, though, are only general orientations. To be able to support adequate treatment of ethical challenges in specific situations, the principles have to be adapted to context and balanced against each other.

In the literature found, any ethical issues mentioned are rarely explicitly linked to the four principles or another theoretical approach. Thus, interpretation is unavoidable. This, however, corresponds to the method of ethical analysis in any principle-oriented approach: the course of action to be ethically analysed has to be subsumed under the proper principles (e.g. is the course of action threatening the autonomy of a person, or does it harm someone?), and checked if there are principles that approve the course of action and principles that prohibit it, resulting in a conflict. The according interpretational decisions were made by at least two independent researchers, then discussed and agreed within the whole research group (HK, DS and MM). All researchers are well experienced in similar systematic reviews on ethical issues (Kahrass et al. 2016; Seitzer et al. 2016; Strech et al. 2013) and have published a meta-analysis on reviews of ethics literature (Mertz et al. 2016); two researchers also have a professional background in philosophy (DS and MM).

Therefore, an ethical issue can arise when (a) one or more (specified) principles have been neglected (e.g. failing to consider that the preventive measure risks reinforcing existing inequalities), or (b) because of conflicts between two or more (specified) ethical principles (e.g. the trade-off between (unintended) harm caused by the preventive measure and the intended benefits for the obese child). In the following, we refer to the first case as an "ethical risk" and to the second as an "ethical challenge".

Literature search

All three systematic reviews (SR) used the Boolean operator "AND" to connect the respective cluster (see table 1). The clusters themselves were composed of free text search terms and MeSH search terms connected by "OR". The search used Medline, EBSCO and others with no restrictions applied. An overview of the clusters can be found in Table 1. In a later step additional literature was identified by a reference check of all those papers found by the three systematic reviews.

Literature selection

We applied the same selection method for all three reviews independently. In the first round, title and abstract were screened for relevance by one researcher (MM or HK). Where it was unclear how to apply the inclusion/exclusion criteria (see Table 1), discussions were held and a consensus procedure was applied. In the second round, full text screening took place in the same manner. The access to full text was realized via institutional subscription, interlibrary loan and direct contact with the corresponding author via *academia.edu* or *researchgate.net*. We excluded articles also if there was no full text accessible or if there was no full text available in English or German (for more details, see PRISMA flowchart, Fig. 2).

Table 1 Search details of the three separate literature reviews

	SR 1	SR 2	SR 3
Search cluster	Obesity + prevention + children + school + ethics	Obesity + ethics[a] + prevention	Obesity + ethics[a] + children
Date of search	03 December 2015	30 June 2015	30 June 2015
Databases	Medline, EBSCO, and others	PubMed	PubMed
Inclusion criteria	Articles that describe ethical issues associated with a preventive measure or obesity at all levels of health care (micro: conducting preventive measures and one-to-one dealing with obese minors, meso: planning and implementation of preventive measures, macro: policy making)		
Excluded issues	Articles that merely describe bariatric surgery interventions for obesity		
	Articles that focus on another primary disease with obesity as a side effect (e.g. Prader–Willi syndrome)		
	Articles that merely describe the relation between obesity and stigmatization in general		
	Articles that merely describe food-industry-specific issues (e.g. "legitimacy" of taxes, ad bans or the "responsibility" of private companies)		
	Articles that merely describe research-specific issues on (obese) children		

[a] Apparently suitable search terms which were not used because they did not find further results: "ethics" [Mesh], "social justice" [Mesh], "personal autonomy" [Mesh], "social behavior/ethics" [Mesh]

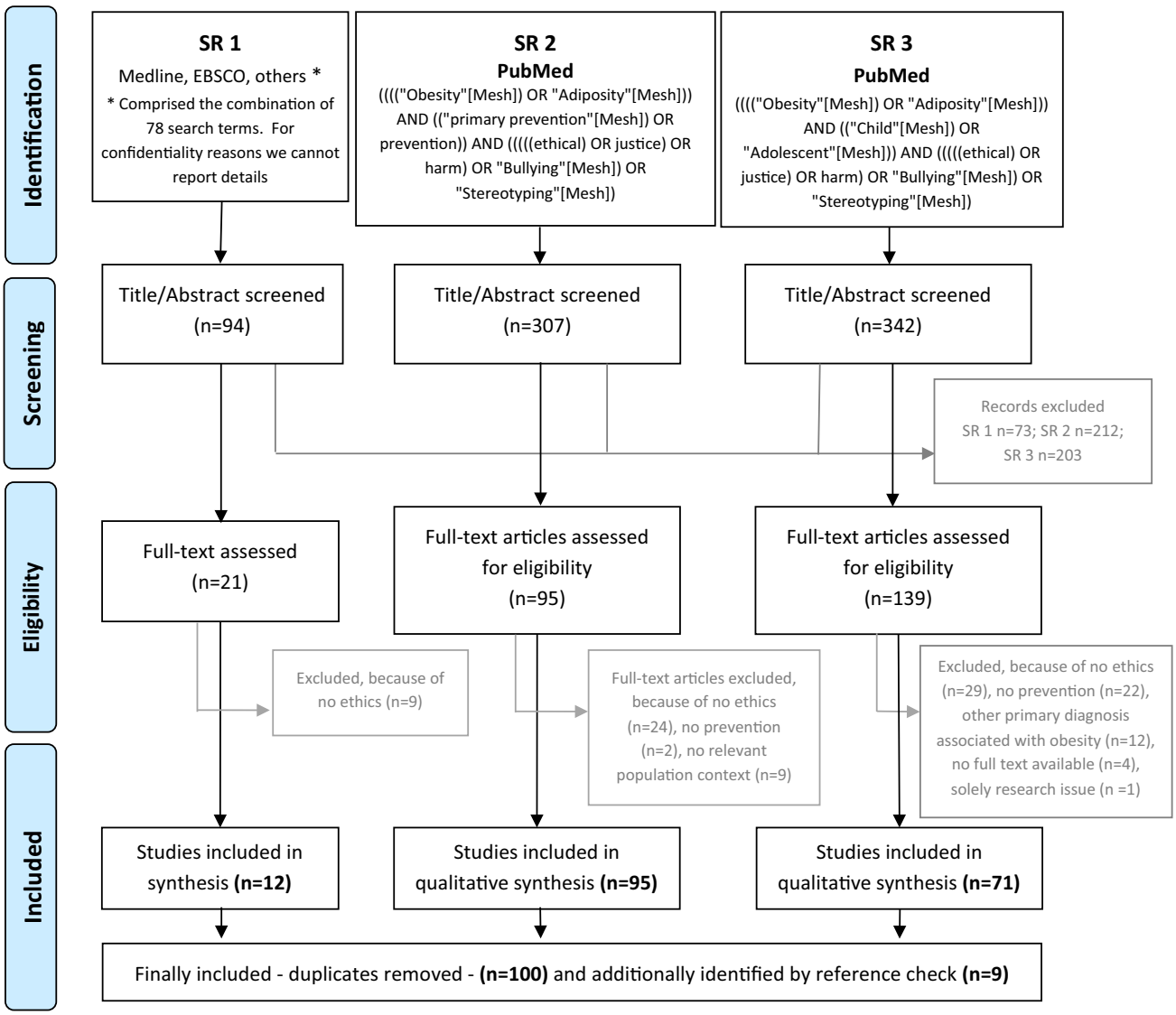

Fig. 2 PRISMA flowchart of search and selection/inclusion (covering all three systematic reviews)

Literature analysis and synthesis

We extracted text passages that implicitly or explicitly describe an issue falling under our definition of ethical issue (see above). Extracting and, afterwards, categorizing ethical issues unavoidably involves interpretative tasks (e.g. which text passages deal with an ethical issue? what is the appropriate paraphrase and category for the issue?). To ensure validity and consistency of extraction and categorization, two researchers (MM and HK) experienced in the method (Kahrass et al. 2016; Seitzer et al. 2016; Strech et al. 2013) identified and initially categorized ethical issues independently in a subsample of three publications from SR 2 and SR 3, and discussed the findings. The remaining publications were grouped into two (SR 2) or three (SR 3) clusters. One author (MM) took the lead in extracting the data from the included literature in SR 2 (MM) and another author (HK) took the lead in SR 3. The results of the first extraction round were merged and represented the first version of the spectrum of ethical issues. The second and third rounds were then used to check thematic saturation of the spectrum (thematic saturation implies that no new categories can be generated by analysing additional relevant literature).

The extraction and categorization of ethical issues were checked by the other authors, with professional backgrounds in philosophy and public health, using random samples of 15 (SR 2, by HK) and 25 (SR 3, by MM). Discrepancies and coding problems were resolved by discussions with all involved authors.

The literature from SR 1 was analysed in the same manner, though the stepwise extraction phase was skipped because of the low number of total hits ($n = 12$). The extracted ethical issues were also used to check thematic saturation of the combined spectrum based on the results of SR 2 and SR 3.

To categorize the extracted issues, we deductively used the aforementioned principles as top-level categories, namely (1) benefit, (2) harm, (3) efficacy/cost, (4) justice, (5) autonomy and (6) legitimacy. Further (sub-)categories were inductively built, although they remained informed by the six ethical principles mentioned above. In the analysis, we additionally differentiated the issues along three dimensions: (1) whether they are more associated with obesity (disease) or the preventive measure (intervention); (2) whether they reflect an ethical risk (inadequate consideration or neglecting of principles) or ethical challenge (conflicts between principles), which describes the type of the issue; and, finally, (3) whether they relate to decision-making at the micro-level (individual), meso-level (institution) and/or macro-level (society, politics) of health care.

Results

Our literature search retrieved 750 publications in total [in detail: $n = 94$ (SR 1), $n = 307$ (SR 2) and $n = 349$ (SR 3)]. Of these, we finally included $n = 12$ (SR 1), $n = 55$ (SR 2) and $n = 71$ (SR 3) in the cumulative review (see PRISMA flowchart, Fig. 2). After eliminating duplicates, we included 100 hits. Only five of the included hits were found as a search result by all three reviews, with SR 3 exclusively responsible for the most of the hits that were finally included (40%), compared to SR 2 (23%) and SR 1 (4%) (see Table 2). We further included 9 references identified by reference check, so we finally analysed 109 publications from 1995 to 2015 (for the comprehensive list of all included references see Online Resource Table A).

From the 109 references, we identified 60 potentially relevant ethical issues. None (SR 1), 22% (SR 2) and 22% (SR 3) of the issues were exclusively identified by one of the reviews. Furthermore, 13% were identified by all three reviews; the respective share of the final spectrum varied from 17% (SR 1) to 78% (SR 3). With respect to the identification of ethical issues, SR 2 and SR 3 were the most fruitful of the three reviews (see Table 3).

Intervention and disease-specific ethical issues

The spectrum of 60 ethical issues consisted of six main categories and 25 subcategories. For each subcategory, we decided whether the issues originated with the intervention ($n = 30$) or the disease ($n = 30$) (see Online Resource Table B).

Table 2 Details on the finally included literature, sorted by search strategy of the systematic review (SR) Nos. 1–3

Included hits ($n = 100$ [+9])	Number of hits exclusively identified by the respective SR (n)	Number of identical hits with SR 1 (n)	Number of identical hits with SR 2 (n)	Number of identical hits with SR 3 (n)	Number of identical hits in all SRs (n)	Total hits (n)
SR 1	4 (4%)	–	2 (2%)	1 (1%)	5 (5%)	12 (12%)
SR 2	23 (23%)	2 (2%)	–	25 (25%)	5 (5%)	55 (55%)
SR 3	40 (40%)	1 (1%)	25 (25%)	–	5 (5%)	71 (71%)

Table 3 Details on the identified ethical issues, sorted by search strategy of the systematic review (SR) Nos. 1–3

Ethical issues ($n = 60$)	Number of issues exclusively identified by the respective SR (n)	Number of identical issues with SR 1 (n)	Number of identical issues with SR 2 (n)	Number of identical issues with SR 3 (n)	Number of identical issues in all SRs (n)	Total issues (n)
SR 1	0 (0%)	–	0 (0%)	2 (3%)	8 (13%)	10 (17%)
SR 2	13 (22%)	0 (0%)	–	24 (40%)	8 (13%)	45 (75%)
SR 3	13 (22%)	2 (3%)	24 (40%)	–	8 (13%)	47 (78%)

Ethical risks, challenges and levels of impact on decision-making processes

Forty of the 60 ethical issues were categorized as ethical risks and 20 as ethical challenges (see Online Resource Table B). In addition, regarding the level of impact on decision-making processes, 29 ethical issues belonged to the micro-level, 44 ethical issues to the meso-level, and 10 to the macro-level (multiple categorizations were allowed for each issue). For example, the risk of giving biased information (Ethical Issue No. 5.3.3) appears at the micro-level when a health care professional interacts with an individual. By contrast, the challenge to include all relevant stakeholders adequately (Ethical Issue No. 4.3.1) affects the planning phase of the preventive measure and is thus located at the meso-level. Finally, the risk to demonize eating by defining it as a major cause of obesity and subsequently to ignore social and cultural dimensions of meaning related to food consumption reflects the social, i.e. the macro-level (see Online Resource Table B).

Discussion

Planning and conducting preventive measures against obesity in school children is beset with ethical issues. We identified 60 different ethical issues discussed in 109 publications from 1995 to 2015. Dealing with ethical issues in a systematic and transparent manner requires an unbiased awareness of the spectrum and the complexity of the respective issues. We, therefore, grouped ethical issues under six basic ethical principles (benefit, harm, autonomy, justice, efficacy and legitimacy) and differentiated them along three dimensions (origin, type and level of impact on decision-making processes).

How to use the spectrum

The spectrum reflects whether an ethical issue is *intervention* or *disease specific* (origin). This distinction can be important, as adequate responses to the ethical issue differ. For example, stigmatization that stems from the disease should be countered by strengthening resilience and coping strategies (Panzer and Dhuper 2014), or by anti-discrimination training for school classes (Diedrichs and Barlow 2011; Poustchi et al. 2013), whereas stigmatization caused by preventive measures would rather be tackled by a modification of the intervention or by special training of the staff.

Another important differentiation is whether the ethical issue can be understood as an ethical *risk* [e.g. of "iatrogenic" harm caused by health care professionals because of prejudice among them (Ethical Issue No. 2.2.5)] or as an ethical *challenge* [e.g. appropriately inducing stress and discomfort to provoke or motivate weight reduction (Ethical Issue No. 1.1.2)]. In a situation with an ethical risk, the moral obligation—e.g. "do no harm"—is clear. The tangible problem arises because harm is indeed caused (unintentionally) by the health care professional. These ethical issues could be substantiated by empirical data as to the scope (rare to frequent occurrence) and extent (little to great damage). In challenging situations it is not obvious what is morally right and wrong, because two principles of equal value are conflicting: "do not stress (harm)" and "enable weight reduction (benefit)". What might adequate recommendations look like when two or more principles conflict? Because it is essential to reflect the preferences and interests of all stakeholders involved in a situation where a conflict occurs, there is no one-size-fits-all solution. Rather than trying to find consensus on the principles themselves, providing a set of criteria that guides the process of ethical decision-making when planning and conducting preventive measures should be the goal (cf. Daniels 2000). Here, the consideration of the relevant principles, attitudes and interests of the individuals involved can be more or less appropriate. Also, both situations demand well-trained staff. The training should first of all sensitize, second provide sufficient guidance or background knowledge on the origin and how to deal with a specific ethical issue, and last but not least train to moderate the process. Our spectrum of ethical issues is an initial evidence base that can be used to raise awareness of ethical issues and could be incorporated in the corresponding trainings.

Furthermore, the comprehensive spectrum could be used to assess how ethical issues are addressed in current manuals or guidelines about obesity prevention for school children. A comparable analysis, though of dementia guidelines based on a full spectrum of ethical issues in dementia care, provided valuable insights into the status quo of such guidelines, and thereby could inform future revisions of guidelines (Knuppel et al. 2013). However, an analysis of existing guidelines or recommendations about obesity prevention for school children is beyond the scope of this paper.

Methodological aspects

This review consists of three separate reviews, with a focus on (a) prevention AND obesity (narrow), (b) prevention ("intervention"), and (c) obesity ("disease"). The results demonstrate that to identify a comprehensive and thematically saturated spectrum of ethical issues in preventive measures against obesity, it was necessary to include both intervention-specific (50%) and disease-specific issues (50%). Furthermore, our results demonstrate that the search algorithm should not necessarily reflect the narrow research question (the share of the specific SR 1 of the final results was 12% of the literature and 17% of the issues).

Our review covers three different effect levels where ethical decision-making can take place (the *micro*-, *meso*- and *macro*-level). This offers a user of our spectrum of ethical issues valuable orientation. We allowed multiple coding and emphasize that it is difficult to draw a demarcating line between the levels. Despite these limitations, this categorization could be seen as a first proof-of-concept demonstration that deserves further discussion and research. However, further reviews should carefully consider the intended purpose, and could use narrower search algorithms, depending on the research question.

Limitations

One limitation of our review might be seen in the fact that we restricted our searches in SR 2 and SR 3 to PubMed and did not systematically search for textbooks. It is clear to us that although our review was systematic we did not include all the existing literature dealing with ethical issues concerning preventive measures against obesity. However, our search strategy allowed thematic saturation, and the publications that were finally analysed covered journals from all relevant fields (medicine, public health, nursing, social science and philosophy). Furthermore, we included several systematic and narrative reviews such as those by Cuttler et al. (2005), Fry (2012), Hinds (2005), Ten Have (2014) and Ten Have et al. (2013).

One could further note that our spectrum does not comprehensively give guidance on how to deal with the issues addressed. There are two main reasons why we restricted ourselves to the descriptive presentation of the ethical issues. First, our aim was to provide an evidence base for the further assessment of ethical issues. Hence, we did not evaluate the relevance of single ethical issue, or determine the best solutions for each issue. Second, there are currently no best practice standards for the development of practice recommendation for ethical issues (Mertz and Strech 2014). This includes the lack of well-established methods for the critical appraisal of ethical issues themselves or the corresponding sources/literature.

A further limitation can be seen using principlism for identifying and defining ethical issues. Besides the inevitable interpretational tasks associated with this approach—which cannot rule out that other researchers could subsume an issue under another principle—other theoretical approaches (e.g. casuistry, or using an ethical theory such as utilitarianism or Kantianism) could lead to a deviating understanding of ethical issues altogether. However, without a specific theoretical approach, ethical issues cannot be identified in the first place. The principle-oriented approach utilized can be regarded as appropriate for this task due to its prevalence in bioethics and public health ethics.

Conclusion

Based on our approach we identified 60 specific ethical issues regarding the prevention of obesity for school children. The specification of basic principles could help to identify relevant issues in decision-making and could be used to train stakeholders to identify and adequately deal with ethical issues. The complexity of a comprehensive spectrum can be structured by differentiating (1) the origin (intervention or disease) of an issue, (2) its type (ethical risk or challenge) and (3) its level of impact on decision-making (micro, meso, or macro).

Acknowledgements We would like to thank Nadine Komainder for her assistance in the search, selection and analysis procedures.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Funding We had no additional funding for this study.

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