Exploring weight inclusive vs. weight-normative approaches in high school nutrition education

Deb Hinchey, Bernice Garnett, Janet Gamble and Lizzy Pope
University of Vermont, Burlington, Vermont, USA

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Abstract

Purpose – Teaching about nutrition is a crucial component of high school health education, with the potential to shape students' perceptions about food, weight and bodies and improve health outcomes. Weight-inclusive approaches have demonstrated success in improving body acceptance, decreasing dieting behaviors and anti-fat attitudes and improving health outcomes and may decrease weight-based bullying. However, little is known about nutrition education in high school settings. This study sought to understand how high school health teachers in Vermont are teaching about the connections between nutrition, weight and bodies and what influences their nutrition-focused curricular decisions. The goal is to inform the development of a novel weight-inclusive curriculum for high school health teachers in Vermont and beyond.

Design/methodology/approach – This study used case study methodology: qualitative interviews with eight teachers and document analysis of curricular materials.

Findings – Findings indicate that weight-normative activities and values dominate curriculum and that multiple levels exert influence on teacher curricular decisions. Findings confirm a need for the development and implementation of a weight-inclusive nutrition curriculum, professional development for health teachers and policy-level interventions as strategies to improve health outcomes.

Research limitations/implications – Limitations of the data collection include a small within-case sample size and limited availability of documents to review. However, the triangulation of gathered and publicly available data ultimately supported an in-depth case study.

Originality/value – The findings from this study inform future directions for both curriculum and professional development for high school health teachers, which is essential for improving health outcomes, reducing stigma and moving toward justice. This is original work.

Keywords Nutrition, School health, Health education, Weight-inclusive, Weight-normative

Paper type Research paper

Introduction and background

Health education delivered in high school settings has a significant influence on young people's understanding of health and adoption of health-promoting behaviors (CDC, 2023). Teaching about nutrition is a crucial component of high school health education, with the potential to shape students' perceptions about food, weight and bodies and improve health outcomes. This study sought to understand how high school health teachers in Vermont are teaching about the connections between nutrition, weight and bodies and what influences their nutrition-focused curricular decisions.

Weight-normative approaches to health

A weight-centered or weight-normative paradigm is one that stresses the pursuit of weight loss, emphasizes weight as a primary indicator of health and alleges that being heavier bears significant health risks (Hunger *et al*., 2020; Tylka *et al*., 2014). However, this approach mischaracterizes the connection between weight and health. High body weight may be associated with poor health, but it is not a causal factor in poor health (Gaesser and Angadi, 2021; Hunger *et al*., 2020; Tylka *et al*., 2014). Additionally, weight-normative approaches are ineffective at generating sustained weight loss, as most people who engage in intentional dieting for weight loss not only gain weight back but many gain back more than they lost (Bacon and Aphramor, 2011; Gaesser and Angadi, 2021; Hunger *et al*., 2020; Tylka *et al*., 2014).

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Weight-normative approaches can have serious negative consequences. The weight-normative narrative frames dietary choices as an individual responsibility, with "obesity" a result of personal failure, laziness and a lack of discipline (Brownell *et al*., 2010; Nutter *et al*., 2024; Puhl *et al*., 2016a; Stoll, 2019). This focus lends itself to a policing of individual bodies that falls inequitably on women and other historically marginalized populations, resulting in significantly worse health outcomes (O'Hara and Taylor, 2018; Stoll, 2019) and increasing stigma and weight bias (Brownell *et al*., 2010; Nutter *et al*., 2024; Puhl *et al*., 2016a, b). Weight stigma has myriad negative outcomes such as decreased academic achievement (O'Hara and Taylor, 2018; Pearl and Lebowitz, 2014), decreased participation in physical activity, delayed medical treatment, diminished quality of life (Palad *et al*., 2019; Tomiyama *et al*., 2018), increased body shame, body dissatisfaction and eating disorders (Hunger and Tomiyama, 2018; Tylka *et al*., 2014). Weight stigma and anti-fat attitudes contribute to the rejection and isolation of fat kids, increasing the likelihood of bullying and victimization (Musher-Eizenman, 2004; Puhl *et al*., 2016a, b). Weight-based bullying is the most common form of bullying in youth worldwide (Puhl *et al*., 2016a), with consequences including depression, low self-esteem and suicidal thoughts (Cohen *et al*., 2005; Puhl *et al*., 2016a).

Finally, focusing on "obesity" and the narrative that individual-level behaviors are at the root of body size misses the overarching influence of the Social Determinants of Health (SDOH) on weight status. The social, environmental and economic contexts in which people live, and the policies that dictate these, shape what individuals have or do not have access to, including food, transportation and recreation opportunities (British Columbia Provincial Health Services Authority, 2013; Cohen *et al*., 2005) and are cited as a primary factor in over 50% of preventable mortality (Hinton and Artiga, 2018; Magnan, 2017; McGinnis *et al*., 2002).

The most used metric for defining "obesity" is the body mass index (BMI) (Faruque *et al*., 2019). BMI measurement is purported to indicate an individual's level of fatness and measure whether someone is of a "healthy" weight (CDC, 2022; Faruque *et al*., 2019; Gonzalez *et al*., 2017). However, BMI may not be particularly informative or impactful to explain or predict health outcomes on an individual level (British Columbia Provincial Health Services Authority, 2013; Burkhauser and Cawley, 2008; Humphreys, 2010). BMI does not take into consideration varied body compositions (Burkhauser and Cawley, 2008; Humphreys, 2010), is less accurate for men than women and seriously mischaracterizes the fatness of racial and ethnic populations (Burkhauser and Cawley, 2008). Despite these flaws, the BMI continues to be widely used as a proxy for health, thus perpetuating a weight-normative cultural narrative.

Weight-inclusive approaches to health

Weight-inclusive approaches advocate that people can be healthy at any size or weight, that all food is fuel, that behaviors are shaped by the broader environments in which people live and that they are the underlying contributors to health and longevity (Hunger *et al*., 2020; Tylka *et al*., 2014). Weight inclusivity is premised on the fact that not all factors – such as genetics and environmental conditions – are controllable by individuals (Tylka *et al*., 2014).

The weight-inclusive approach supports better overall health and longevity, can improve adherence to treatments and decreases overall weight-based stigma, thus lessening its consequences (Tylka *et al*., 2014). An example weight-inclusive approach is Health at Every Size (HAES), which focuses on exercising for pleasure and listening to internal eating cues while paying attention to how certain foods make the body feel (intuitive eating), instead of approaching exercise and food consumption as a means towards weight loss (Tylka *et al*., 2014). An HAES approach has myriad benefits including improved self-care practices, an increase in health-promoting behaviors, improvements in physiological measures like blood pressure and blood lipids and improvements in mental health outcomes (Bacon and Aphramor, 2011). In both the college and high school settings, HAES approaches to teaching nutrition

have demonstrated success in improving body acceptance and decreasing both dieting behaviors and anti-fat attitudes while improving healthy eating attitudes (Hawks *et al*., 2008; Healy *et al*., 2015; Humphrey *et al*., 2015).

Health education in schools

School health education is not only about reducing actual health risks (CDC, 2023) but is also essential to students succeeding academically (Basch, 2011). Health education across the USA is inconsistent at best, with many school districts requiring minimal subject-area education and lacking outcome assessment (Auld *et al*., 2020). As a primary organizational context for health promotion activities, schools in the USA may be inadvertently increasing weight stigma through an emphasis on programming focused on weight loss as opposed to health behaviors like nutrition and physical activity (Kenney *et al*., 2017).

Influences on health and nutrition curriculum

Teacher preparation and training is an essential component to health education instruction in high schools (Briggs *et al*., 2010; Herr *et al*., 2012). Additionally, professional development in specific content areas, including nutrition, improves teachers' ability to deliver curriculum (Lee *et al*., 2019) and contributes to higher learning gains in students (Murray *et al*., 2019). Strong collaborations between food service staff, health education teachers, school nurses and other health-related staff facilitate consistent messaging around nutrition and an improvement in the overall school food environment (Lee *et al*., 2019). Having an actively supportive principal, as opposed to a principal that demonstrates passive buy-in for a program, is vital to effective implementation and perhaps the most important factor to success (Storey *et al*., 2016). Policies at multiple levels can also have a significant positive impact on the implementation of and consistency in delivering health education (Eisenberg *et al*., 2012; Felton *et al*., 2005; Hulme Chambers *et al*., 2017).

It is clear from reviewing the literature that weight-inclusive approaches have demonstrated success at both the high school and college levels. It is also clear that there are various levels of influence on health teacher curricular decision-making. The gap that currently exists is a comprehensive understanding of the paradigm through which nutrition is being taught in the high school classroom in Vermont and the factors that influence curricular content. This study provides an exploration of these elements, which are essential to inform future directions for both curriculum and professional development opportunities for high school health teachers.

Theoretical framework

Critical theory is premised on identifying and challenging dominant belief systems and power structures and exploring social inequalities (Green, 2017; Winkle-Wagner *et al*., 2018), and this study is rooted in a critical obesity studies paradigm. Critical obesity scholars seek to explore, challenge and critique the assumptions that underlie the dominant, weight-normative narratives around obesity – specifically, the weight-health connection, the pathologizing of bodies through the obesity-as-disease framing and body size as personal failure (Bombak, 2015; Cameron, 2016; Hopkins, 2012; Russell and Cameron, 2016; Stoll, 2019). In the case of this study, a critical framework was essential to explore whether the nutrition curriculum is perpetuating the dominant, weight-normative narrative and to identify the various influences that impact individual-level teacher decision-making.

Through this research, researchers endeavored to answer the following questions:

(1) How are health teachers in Vermont high schools educating about the connections between nutrition, weight and bodies?

- How is high school health education consistent with a weight-inclusive paradigm?

- How is high school health education consistent with a weight-normative paradigm?

(2) What multi-level factors influence Vermont high school health teacher curricular decision-making related to nutrition, weight and bodies?

The social-ecological model (SEM), widely used in public health, provides a visual representation of the complex interaction between multiple levels of influence on individual health outcomes; these levels influence and are influenced by each other (CDC, 2017) (see Figure 1). The application of the SEM framework supported a critical analysis of not only the curricular content of nutrition education in Vermont high schools but also the various factors that influence the content.

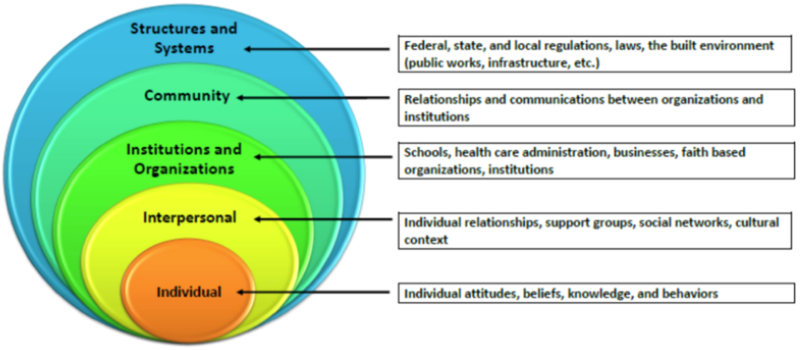
Methods

This research is nested within a larger, mixed-methods project working towards a reduction in weight stigma and a reduction in the development of disordered eating and weight-based bullying through the design and implementation of a weight-inclusive high school nutrition education curriculum. For this study, an exploratory, single-case design was used, and a common case was identified. A common case supports an understanding of everyday situations and can provide an opportunity to explore social processes and relationships between structures, individuals and social phenomena (Yin, 2018). The case for this study was defined as nutrition education in Vermont high schools.

Participants

In case study methodology, it is essential to identify information-rich participants that will provide an in-depth understanding of the phenomenon being studied (Miles *et al.*, 2020; Yin, 2018). The goal of sampling, therefore, is to understand a phenomenon or concept, as opposed to being driven by representativeness (Miles *et al.*, 2020). Within this case, purposeful sampling was used to identify current health teachers to provide unique insight into what they are teaching in their classrooms and why (Lee *et al.*, 2010). It was important, at the outset of this study, to consider a sampling method that would incorporate a breadth of perspectives from health teachers in schools across the state, as the contexts in which teachers work and the students whom they teach will vary depending on school location and student demographics. Teacher sampling therefore was multi-level and criterion-based.

A primary inclusion criterion for this study was that participants must be current high school health teachers in Vermont. Schools with health teachers were first stratified by whether



Source(s): CDC (2017)

Figure 1. Social-ecological model

BMI is or is not taught in the curriculum (Vermont Department of Health, 2020) to potentially identify schools that may be moving away from an obesity-focused paradigm. The next criteria for inclusion were all accessed via the Vermont Agency of Education data Dashboard (Vermont Agency of Education, 2023). These criteria were school size, percent of students eligible for free and reduced lunch (as a proxy for school SES), percentage of students who identify as non-white and whether schools were rural or urban. It was essential to ensure that teachers were identified from schools that represent the broader socio-economic, racial and rural/urban demographic profiles of the state. Figure 2 offers a visual representation of the sampling schema, and the characteristics of the schools included in the sample are listed in Table 1.

Semi-structured, qualitative interviews were conducted with eight health teachers from Vermont high schools. The interview questions were developed by the researchers and allowed for the exploration of influences on and content of high school nutrition curriculum, including (1) the multiple levels of influence on curricular decisions and associated power structures, (2) weight-inclusive and weight-normative curricular content and (3) curricular elements that take a critical lens to the influences on individual health behaviors. The research team is comprised of experts in nutrition, eating disorders and public health, and the questions were informed by current evidence around teacher training in health education, weight-normative and weight-inclusive principles and critical pedagogy and guided by the SEM as an overarching framework.

Procedure

After receiving Institutional Review Board approval, an email was sent directly to prospective participants explaining the study and requesting participation. Participants were offered compensation in the form of a $50 check. Documents attached to the email included a research information sheet that detailed risks, benefits, compensation and voluntary participation and the interview questions. Sample questions include:

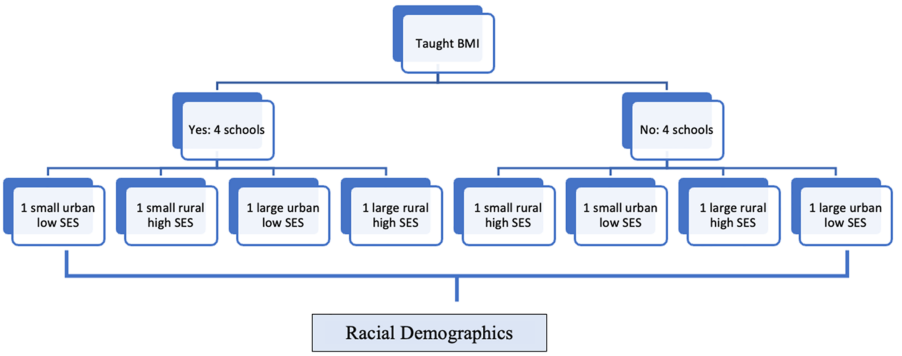
(1) What is your educational background?

(2) Do you have training specifically in health? Healthy bodies? Nutrition?

(3) What informs your curricular decisions around nutrition and healthy bodies?

(4) Do you teach about BMI in your class?

(5) If yes, how do you frame BMI through your teaching?



Source(s): Authors' own work

Figure 2. Within-case sampling schema for Vermont high schools

Table 1. School Characteristics for Teacher Interviews (N = 8)

School	Taught BMI? Y = Yes N = No	School size (# of students)	% of students qualified for free/reduced lunch	School location Rural/Urban	% White students
1	Y	221	57%	Urban	34%
2	Y	509	24%	Urban	92%
3	Y	1227	22%	Rural	83%
4	Y	393	43%	Rural	97%
5	N	729	19%	Urban	87%
6	N	688	50%	Urban	94%
7	N	381	41%	Rural	93%
8	N	370	42%	Rural	95%

Source(s): Authors' own work

(6) How do you approach teaching about different foods and food choices?

(7) What is your approach to discussing unhealthy weight control practices and eating disorders?

(8) How do you teach about various influences on nutrition and healthy bodies that are beyond individual student choices?

(9) Can you give me an example of an activity that you use to teach about nutrition or healthy bodies?

Interviews lasted approximately 60 min and took place via Microsoft Teams. They were recorded using VoiceThread on the researcher's computer. The interviews occurred during the months of November and December 2022 and January–March 2023. Interviews followed a semi-structured format to allow teachers to expand on the topics being discussed.

Data analysis

The researcher applied a lean coding approach to the data and began with a priori codes informed by a review of the literature, the conceptual framework and research questions (Miles *et al.*, 2020). Once initial codes were established, each member of the team coded the same transcript to ensure consistent interpretation and application of codes (Giesen and Roeser, 2020). Many of the initial codes were too broad and the team expanded the codes to be more specific and to better address the research questions. Next, researchers initiated second cycle coding, studying the frequency at which codes were applied, and wrote memos reflecting on themes that emerged (Saldana, 2021; Yin, 2018) During the coding process, noteworthy quotes were highlighted that helped to understand and interpret the data in relation to the research questions (Creswell and Poth, 2018; Yin, 2018). Finally, researchers used pattern coding and grouped excerpts into themes (Saldana, 2021). Member checking and peer debriefing were also used throughout the process to ensure consistency.

As previously noted, critical theory is premised on identifying and challenging dominant belief systems and power structures and exploring social inequalities (Green, 2017; Winkle-Wagner *et al.*, 2018); in the case of this study, a critical analysis of the interview responses, through the lens of a critical obesity paradigm, was essential to explore whether nutrition curriculum is perpetuating the dominant, weight-normative narrative. Furthermore, the application of the theoretical framework supported the identification of the various influences that impact curricular decision-making and implementation.

A review of additional sources of evidence was an important addition to the data collection and analysis for this study and contributed to construct validity. Given that schools carry curricular requirements for health class and the state of Vermont has established policies and standards for health education in the high school classroom, reviewing both available curriculum and overarching policies influencing content for health education was essential. Additionally, district, school and organizational materials consulted by teachers and associated with nutrition-focused professional development were reviewed. Documents were analyzed with the purpose of triangulation: corroborating and deepening understanding of findings from teacher interviews through multiple measures of the same phenomena (Quintão *et al*., 2020; Yin, 2018).

The codes used in the analysis of teacher interviews formed the foundation for document analysis. After an initial skimming of the various documents, researchers looked for themes that were consistent with or divergent from those that emerged in the interviews. When analyzing policies, curricula and professional development materials, researchers endeavored to identify weight-normative and weight-inclusive language and concepts in addition to themes relating to factors that influence what is taught in high school nutrition class sessions.

Results

A total of three key themes were identified in the interview data and supported through a document analysis. When exploring how health teachers in Vermont high schools are educating about the connections between nutrition, weight and bodies, findings indicate that weight-normative values and activities dominate nutrition curriculum and that curriculum varies in content that identifies the multiple levels of influence on health outcomes. While investigating influences on curricular decisions, findings clearly showed that multiple socio-ecological levels exert influence on curricular decisions.

Weight-normative values and activities dominate health curriculum

Table 2 summarizes characteristics of the teachers included in this study and provides example quotes pertaining to curricular content. The quotes illustrate weight-normative values and/or approaches to teaching nutrition. These include tracking meals and dichotomizing food into "good" and "bad" categories with undertones of food shaming and a strong emphasis on vilifying sugar, framing body size broadly and obesity specifically as a health concern, supporting the use of the BMI as a measure of individual health and using stigmatizing language when discussing body size.

Seven teachers interviewed noted that they have students keep a food log and use these logs as a way to analyze student diets and set eating-related goals, which is a weight-normative food dichotomization strategy. Half of the interviewees are teaching about the BMI, and the other half noted that this was taught in physical education (PE) or by a PE teacher. Interestingly, there were clear contradictions in the responses from six of the interviewees when discussing the teaching of BMI. Teachers expressed *both* weight-normative and inclusive values when explaining how BMI is an important concept to cover while at the same time voicing concerns about the potential for harm and questioning its value. For example:

> I don't, and we used to have a PE teacher who – I would love some suggestions on how to teach that – who used to have the kids take their BMI. And I wasn't so . . . into that, especially with kids with eating disorders, or unhealthy perceptions, not body positive. Teacher #7

Finally, all eight of the teachers did share some, although minimal, weight-inclusive values, specifically by discussing the ways in which certain foods make bodies feel or exploring the connection between the consumption of certain foods/essential nutrients and health outcomes. An example is when teacher #2 said, "If we're eating healthily, we're way less likely to get heart disease and diabetes and stroke and certain types of cancers."

Table 2. Teacher characteristics and example weight-normative quotes

Teacher (number corresponds with school)	Teacher role	Teacher years of experience teaching health	Teacher educational background in health and/or nutrition	Teacher professional development in nutrition	Sample weight-normative quote
1	Health teacher	6 years	Undergraduate degree in nutrition	1 class	"They're gonna keep a food journal. And then, we're gonna analyze the foods they eat. And then, by the end of that lesson, they're gonna have a one-day meal plan for them. Something that is balanced."
2	Health teacher	26	Undergraduate degree in nutrition; some graduate nutrition classes	Minimal	"I . . . show the movie Supersize Me. I don't know if you're familiar with that documentary . . . It's still an effective tool to bring awareness around the problem in society that obesity brings, the health problems that it brings. And that it's just so easy to rely on fast food."
3	Health and PE teacher	6 years	Undergraduate degree in EXCS 1 college-level nutrition class	1 class	"I let them know it's (BMI) the ratio between height and weight. And we talk about how it is a general indicator of health. But again, it doesn't paint the whole picture. We talk about muscle density. And insurance companies will use it when your parents apply for life insurance. So, again, a general indicator of health."
4	Health teacher	22 years	2 college classes in nutrition (BA History; grad in teaching)	1 class	"I also talk a lot about portion control. We do things talking about portion control . . . I'll bring in measuring cups to show them when you're looking at the back, reading the nutritional label of cereal, how much is a cup of cereal."
5	Health teacher	27 years	Undergraduate degree in PE/Health No nutrition	No	"Definitely cover avoiding sugar, reducing salt. We talk about how food is produced in the sense of their adding sugar, salt, and fat so that you eat more processed food."

(*continued*)

Table 2. Continued

Teacher (number corresponds with school)	Teacher role	Teacher years of experience teaching health	Teacher educational background in health and/or nutrition	Teacher professional development in nutrition	Sample weight-normative quote
6	Health and Physical Education Teacher	2 years	Undergraduate degree in EXCS	No	"Honestly, it's like, these . . . County people are super sensitive about how they're all really fat and obese . . . We have these middle school health teachers that say that BMI is no good, because they're considered obese on it, because they're obese. So, it's kinda like, we touch on it, but there was almost this push in the middle school to kinda poopoo the BMI scale. Which, whatever. I'm no expert."
7	Health teacher	35 years	Undergraduate degree in health education	No	"(Teaching BMI) . . . sensitivity is high in that area, especially when you have some grossly obese kids sitting in your class."
8	Health and PE	1	Undergraduate degree in PE/Health Some nutrition courses	Yes	"So, we'll do the (BMI) calculations. Everybody will do their own and if anybody wants to share they can share. And it's hard for me to do any groups or anything like that. One teacher told me to pull somebody's BMI and put it up on the board and have them guess who it is, and I was like ah. But I have them just do it individually and then kind of just see where they're at and then they can share if they want and everybody can agree if that makes sense. We can kind of talk about it a little bit."

Source(s): Authors' own work

Teaching about the multiple influences on health

While all of the teachers supported the narrative that students have the power and responsibility to make individual-level, health-promoting decisions, two teachers specifically voiced the opinion that individual behavior is the primary influence on health outcomes. Teacher #2 said, "We talk about the leading causes of death and how individual behavior is the number one influence of our health outcomes."

However, all of the teachers also noted additional influences and discussed that individuals don't have control over everything:

> Talking about access to good food, how limiting it is. A lot of times, it's more expensive . . . And then, we talked about how the media does – we get bombarded with a lot of advertisements that aren't necessarily promoting what's best for public health. And then, we dive into, all right, what are some of the politics behind that? What type of money goes into food lobbying? Teacher #6

The most common levels of influence that all teachers indicated teaching about were family, peers and media, which are exemplified in the following two excerpts:

> We actually do a whole unit on analyzing influences, mostly from values, our religion, our family, and then our peer pressure. And so, then, that's the first lesson that they learn is who's influencing you and how to recognize how they're influencing you . . . we kind of circle through that throughout the entire health curriculum, and nutrition is included in that. Teacher #1

> We talk a lot about culture. So, families, it's all about cultural eating habits. And like peers, do you eat more when you're with friends? Do you eat more when you're alone? we have the conversation around that. Media, imaging, what gets marketed." Teacher #5

Multiple levels exert influence on curricular decisions

Individual level: teacher educational background. Most of the teachers interviewed solely teach health, with three also leading PE classes. Years of experience teaching health ranged from one to 35, and while 7 of the teachers hold undergraduate degrees in a health-related field, none of them have engaged in any extensive professional development around nutrition. When discussing their backgrounds in nutrition, there was no consistency in educational training among the participants. Backgrounds ranged from having majored in dietetics (two teachers) to having taken or currently taking "some" college-level nutrition classes (three teachers), to being self-taught about nutrition (one teacher) and to having minimal nutrition experience (two teachers). Teacher #7 shared, "I have a degree [. . .] only in health education, not health in nursing, or health in PE, or health in whatever [. . .] So, I'm a rare bird [. . .] I will be honest with you, my background in nutrition is weak."

Interpersonal level: collaboration. Throughout the interviews, peers within the same school emerged as primary influences on curricular decision-making. All of the teachers noted collaboration with peers, ranging from school nurses (four teachers), food service staff (three teachers), other teachers (six teachers) and PE teachers (six teachers). It is interesting to note that peer collaborators may or may not have an educational background in nutrition.

> Yeah I would say the school nurse. We have a nutrition committee. But nutrition I would say – I collaborate with teachers who are passionate about it personally. But it tends to be the science teachers. Some of the foreign language teachers are foodies. And our fitness teachers also do a good bit with nutrition. So, sometimes we refer to each other. Teacher #2

Only two of the interviewees mentioned school leadership as having an influence on their curriculum: one teacher discussed support from the district, and another noted that their assistant principal is interested in nutrition and therefore engaged in curricular content:

> We have a health committee. It's not just curriculum based, it's a bunch of people that care about the school's health and stuff. So, I can actually go to them and kind of ask them some questions if they think there's anything else I should add in or anything like that. Our assistant principal is pretty big into nutrition and health so she's good to bounce ideas off of for sure. Teacher #8

Institutional and community level: teacher professional development. All of the teachers interviewed discussed state-level requirements for professional development as a driving factor in their pursuit of additional health-related knowledge. While four teachers identified state-level organizations as a primary source for health-related professional development, the remaining four participants noted a lack of accessible opportunities focused specifically on nutrition and healthy bodies.

> The last five years have been impossible to get good professional development …. when I see professional development come up so I can retain my license, I take them. But you don't find a lot of health, or nutrition and weight-related professional development courses out there. Teacher #4

Structures and systems level: power structures and policies. While five of the teachers noted that there is not enough time in the curriculum overall devoted to health, two of the participants specifically identified that nutrition is not seen as important or valued as a part of the health curriculum. One shared:

> It's always drug and alcohol, sexual education, bullying, more recently, social media, vaping, things like that. Nutrition always seems to be the – I don't know how to explain it, but it's not a main focus. I don't think it's seen as critically important. Sometimes when reports come out about childhood obesity, all of a sudden it becomes important. I just feel like whenever there is a health emergency that then becomes the most important. Teacher #4

All of the participants noted that, while they have the autonomy to make curricular decisions, state-level requirements, which are based on the national health education standards, drive curricular decision-making. Teacher #3 shared, "I work really closely with the other health teacher that I work with […] we use the national health standards […] we have a lot of autonomy in what we're doing and how we're doing it."

Discussion

Health teachers in Vermont appear to hold both weight-normative and weight-inclusive values. However, weight-normative activities and pedagogy dominate nutrition curriculum, rendering any weight-inclusive values relatively insignificant. It became clear through the qualitative interviews for this study that BMI not only continues to pervade the framing of health in high schools but is also taught by both health and PE teachers, perpetuating a weight-normative narrative linking weight to health. While teachers in this study openly question its utility, any attempts to problematize BMI appear to stop short of a critical analysis of the tool itself, its racist roots, its lack of scientific basis or the potential to cause harm to students through increasing weight-based stigma (Palad *et al*., 2019; Tomiyama *et al*., 2018).

Additionally, activities such as food diaries, food tracking, portion control and food classification are common within the nutrition curriculum, which was clearly described through interviews and corroborated via a review of curricular sources, documents and materials. Tracking and the dichotomization of food have significant potential to trigger or exacerbate disordered eating patterns (Levinson *et al*., 2017; Pinhas *et al*., 2013). During the interviews, teachers also regularly used weight-normative, stigmatizing language when describing food consumption and behaviors, body size/weight and foods that teachers view as unhealthy. These approaches are important to note, as it is possible for educators to unintentionally reinforce fat bias through pedagogical practices that conflate weight and health and the use of images that objectify fat bodies (Pausé, 2016).

It also became clear that high school nutrition education remains focused on individual-level decisions and behaviors. There appear to be attempts to name additional levels of influence, including peers, families and the media, but little attention is given to critically analyze the power structures that dictate which individuals or populations are afforded decision-making abilities. Given the contribution of the SDOH to health outcomes, supporting students in a critical understanding of the role of social, environmental and economic contexts

and the policies that dictate these in shaping what individuals have or do not have access to is essential (British Columbia Provincial Health Services Authority, 2013; Cohen *et al*., 2005).

When exploring the levels of influence (SEM) on curricular decision-making, teacher autonomy emerged as a primary theme; however, teacher background in nutrition is highly variable, with concerns voiced around a lack of nutrition-focused professional development, which teachers are clearly asking for. Health teachers with a health education certification see higher learning gains in their students (Murray *et al*., 2019), as do teachers who receive health education-related professional development (Murray *et al*., 2019; Szucs *et al*., 2020). Therefore, the variability in teacher background in nutrition coupled with a lack of professional development is concerning.

Peers also emerged as a primary influence, with school nurses and PE and other teachers identified as key partners on both an individual level and as members of school-wide committees. Only two teachers referenced administrative-level support for nutrition curriculum, and while teacher decisions are heavily influenced by state-level requirements, these requirements are vague and do not stipulate specific content. Principal support (Storey *et al*., 2016) and school and state-level policies can have a significant positive impact on the implementation of and consistency in delivering health education (Eisenberg *et al*., 2012; Felton *et al*., 2005; Hulme Chambers *et al*., 2017); however, consistent with Auld *et al*. (2020), teachers in this study suggested that health education, broadly, is not a valued part of the curriculum.

Implications for student physical and mental health

At both the college and high school levels, weight-inclusive pedagogy has resulted in positive impacts on body image, eating behaviors and anti-fat attitudes (Hawks *et al*., 2008; Humphrey *et al*., 2015) and should be explored more deeply. The recent COVID-19 pandemic saw a significant rise in eating disorders in youth (Cooper *et al*., 2020; Reed and Ort, 2022; Zipfel *et al*., 2022). Given this, and the high rates of weight-based bullying in adolescents and young adults, it is critical that schools begin to implement health education nutrition curriculum that are based on weight-inclusive principles. Further, if nutrition education is going to succeed in promoting health, students need to have a solid understanding of the factors that are at the root of health outcomes, which not only requires the delivery of content but also an analysis of the systems of power and oppression that dictate the adoption of healthy behaviors and dominate health discourse broadly and nutrition education specifically (Martinson and Elia, 2018). Applying a critical framework to nutrition education would move pedagogy beyond an individual focus towards one that develops in students the skills to identify structural factors at the root of health outcomes (Fitzpatrick and Allen, 2019; Fitzpatrick and Burrows, 2017; Leigh Jette and Pluim, 2020; Martinson and Elia, 2018; Wright *et al*., 2018). The development of a new, weight-inclusive curriculum would support educators to this end. Additionally, getting buy-in from administrators and others in positions of power could serve to transform the school environment more broadly, which has the potential to change policies and associated systems of power that perpetuate weight-normativity in spaces both inside and outside of the health classroom.

Limitations

Limitations of the data collection for this case study include a small within-case sample size and limited availability of documents to review. While the intended sampling schema would have ideally yielded additional teachers, a lack of response from many made this difficult. Ideally, nutrition curricula would have been collected from every teacher interviewed, but not all teachers had or were willing to share written curricula. However, despite these limitations, the triangulation of gathered and publicly available data ultimately supported an in-depth case study.

Conclusions

An understanding of what and how high school students in Vermont are *currently* learning about nutrition, weight and bodies is a necessary first step to confirm the need for and inform curricular and professional development. As contexts vary, this exploration is essential in educational systems locally and globally. The education system, as a space in which dominant narratives around nutrition, weight and bodies are reinforced and internalized (Leahy, 2009), is uniquely positioned to shape the narrative around weight, health and bodies. The findings from this study will not only contribute to the critical obesity discourse but will inform future directions for both curriculum and professional development opportunities for high school health teachers, which is essential for reducing stigma and moving toward justice. Future research directions include further analysis of the impact of weight-inclusive curriculum on weight-based bullying and disordered eating in high school students, as well as an exploration of additional approaches to counter dominant weight-based paradigms in school settings broadly through education, practice and policy.

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Corresponding author
Deb Hinchey can be contacted at: deborah.hinchey@med.uvm.edu