BMI screening in schools: helpful or harmful

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Abstract

This is a comprehensive review of policies and research regarding body mass index (BMI) screening in schools in the United Kingdom and the United States. Although there are potential benefits to conducting screenings in schools, there is also the potential to do harm to the children who are identified as overweight. School administrators need to consider a number of factors discussed in this article before making a decision about committing resources to BMI screening.

Introduction

The problem of childhood obesity has become a global issue that is being addressed at many levels. In June 2005, World Health Organization sponsored an Expert Meeting on Childhood Obesity in Kobe, Japan [1]. Participants reviewed the major contributing factors to childhood overweight and obesity, as well as issues concerning the assessment of overweight and obesity among school-age children and adolescents. They also reviewed existing intervention programs and their effectiveness on preventing childhood obesity. One task accomplished at the meeting was the identification of a process to develop international reference standards for monitoring the growth of school-age children and adolescents. Recommendations from this meeting have not yet been published but the emphasis on monitoring the growth of school-age children and adolescents raises concerns about how this will be done.

The United Kingdom appears to be the only country that has developed national guidelines on measuring children’s heights and weights in school settings. The UK Department of Health issued guidance for gathering local data on childhood obesity in order to (i) inform local planning and target local resources and interventions and (ii) enable tracking of local progress against the goal of halting the year on year rise in obesity among children under the age of 11 years by the year 2010 [2]. This screening is to be carried out among all primary schoolchildren when they enter school and again when they are in Year 6 (ages 10–11 years). Schools are required to inform parents that their children will be weighed and measured, and allow parents to ‘opt their child out of the measuring process’.

In 1998, the US government declared that an epidemic of childhood obesity was occurring in this country [3]. Three years later, the US Surgeon General issued the ‘Call to Action to Prevent and Decrease Overweight and Obesity’ to stimulate the development of specific actions targeting this public health problem [4]. One response to this call for action was the passage of a law by the Arkansas state legislature requiring schools to, among other things, weigh and measure students, calculate their

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body mass index (BMI) and send home a ‘BMI report card’ to parents [5]. The nearby state of Tennessee passed legislation allowing schools to do this but not requiring them to do it [6]. Proposed legislation requiring school reporting of BMI to parents in the states of Texas and Michigan encountered strong resistance [7, 8]. The practice of having schools issue BMI report cards has remained controversial [9]. The question of whether this practice is helpful or harmful is unresolved, but certainly needs to be considered.

The Center for Weight and Health in the College of Natural Resources, University of California, Berkeley, has outlined the issues in ‘Weighing the risks and benefits of BMI reporting in the school setting’, a paper available on it’s Web site [10]. This article will review and expand upon the issues outlined in that paper.

**Guidelines for school health screening**

In the United States, guidelines for school health screening programs have been issued by the Maternal and Child Health Branch (MCH) of the US Department of Health and Human Services [11]. The US guidelines state that ‘It is often suggested that schools screen for numerous health-related problems in addition to mandated screens. In recent years this list includes mental health problems, substance abuse, hypertension, obesity, type 2 diabetes, high cholesterol, asthma, tuberculosis, and head lice. Before implementing a school screening program, look for evidence that mass screening and school-based screening are effective and do not cause inadvertent harm. Evidence to support or oppose screening for many of the aforementioned health problems is still being developed. Work with public health authorities to evaluate the following before adopting a new screening program: difficulties incurred by not detecting the problem in school-age children through a screening process; the effectiveness of therapy available; the relative efficiency of utilizing schools as the screening site; the availability of remediation and follow-up for all students with positive screening results; and the cost of the screening program’. The overarching principles for health screening are ‘an inclusive, respectful school climate; school policies consistent with laws; and, protection of student and staff confidentiality’.

**Detecting and monitoring childhood overweight**

The first consideration in determining whether or not to conduct health screening is ‘the difficulties incurred by not detecting the problem in school-age children through a screening process’. The problem of increasing weight in children in the United States was initially identified from data gathered by the Centers for Disease Control (CDC) during National Health Examination Surveys (NHANES) [12]. In 1999, NHANES became a continuous program with obesity and overweight as specific conditions which the program will continue to monitor. In addition to NHANES, the CDC in collaboration with the Maternal and Child Health Bureau of the US Department of Health and Human Services conducted the 2003 National Survey of Children’s Health [13], which included data that are being used to compare the prevalence of childhood overweight among states [14].

One reason for instituting BMI screening is to evaluate how changes in the school curriculum and environment impact these measurements over time. A review of successful school-based interventions for the prevention of overweight suggests that for interventions to be successful, permanent modifications to the school environment may be as important as classroom curricula [15]. The CDC has a list of 10 key strategies that schools can use to promote physical activity and healthy eating in order to prevent obesity. These are described on a Healthy Youth Initiative Web site [14]. Clicking on each strategy reveals a plethora of resources available to help schools implement each strategy. The key strategies and related resources do not
include any recommendations or instructions regarding screening student’s BMIs and sending BMI report cards to parents. The CDC convened an expert panel on the role of schools in addressing childhood overweight during which the topic of BMI reporting was addressed (G. Woodward-Lopez, personal communication, member of the expert panel on the Role of Schools in Addressing Childhood Overweight, Atlanta, GA, USA, 25–25 May 2005). The panel concluded that there was insufficient evidence to recommend that schools conduct BMI screening and report the results to parents. No consensus was obtained as to whether or not to recommend such actions (Table I).

### Referrals to effective therapy

The second consideration in determining whether or not to screen for a condition is the ‘effectiveness of therapy available’. Research involving the design, implementation and evaluation of different approaches to treating overweight/obesity in children is limited and the applicability of the findings to children of diverse ethnic and socioeconomic backgrounds is inconclusive [16]. As a consequence, consensus regarding what constitutes effective treatment programs has not been reached. The preponderance of recommendations coming from various agencies and organizations advocate that resources be directed toward prevention [17, 18]. Even if schools detect the problem of childhood overweight, there is concern regarding their ability to recommend effective low-cost therapies that are readily available in the community.

### Organizing and managing screening

The third consideration in determining whether or not to implement school BMI screening is ‘the relative efficiency of the screening procedure’. According to the guidelines for school health screening programs, school administrators are responsible for hiring or contracting health professionals who have completed the appropriate academic training for their field and are licensed, credentialed or certified to provide the services and education for which they are responsible. These professionals may delegate health-related services to unlicensed assistants as long as they are trained, oriented and supervised by the appropriate professional. The guidelines point out that assigning such duties to untrained employees may provide a poor quality of care and expose schools to legal risk.

The most appropriate persons to conduct school health screenings are school nurses [19]. However, today there are limited numbers of school nurses available to manage screenings. A USA Today examination of 2004 Census records showed that the national student-to-nurse ratio of 950 : 1 is well

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**Table I. Ten key strategies [14]**

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<thead>
<tr>
<th>Building a strong foundation</th>
<th>Taking action</th>
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<tr>
<td>1. Address physical activity and nutrition through a coordinated school health program</td>
<td>5. Implement a high-quality health promotion program for school staff</td>
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<td>2. Designate a school health coordinator and maintain an active school health council</td>
<td>6. Implement a high-quality course of study in health education</td>
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<td>3. Assess the school’s health policies and programs and develop a plan for improvements</td>
<td>7. Implement a high-quality course of study in physical education</td>
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<td>4. Strengthen the school’s nutrition and physical activity policies</td>
<td>8. Increase opportunities for students to engage in physical activity</td>
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<td>9. Implement a quality school meals program</td>
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<td>10. Ensure that students have appealing, healthy choices in foods and beverages offered outside of the school meals program</td>
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over the recommended federal ratio of 750 : 1. The report blamed the problem on overextended school district budgets, poor enforcement of the federal ratio recommendations and low school nurse salaries [20]. This same situation appears to exist in the United Kingdom where guidelines recommend that ‘where they are available, schools nurses have an essential role in helping tackle the childhood obesity epidemic ...’ [2].

In the United States, teachers, teaching assistants and even volunteers are conducting BMI screenings of students [6]. The National Association of School Nurses has issued a consensus statement on clarifying the process of delegating tasks, such as conducting health screenings, to unlicensed assistive personnel [21]. Even then, it is the school nurse who is deemed responsible for the overall supervision and management of these tasks in the school setting. Interestingly, the legislation passed in Arkansas or Tennessee does not mandate that school nurses oversee height–weight screenings conducted in their schools, although there is evidence that Arkansas school nurses are playing a major role in that state’s BMI screening [22]. Having a school nurse manage the task of BMI screening increases the likelihood that this task will be carried out in a caring and sensitive manner, and that accurate measurements will be taken. Nurses use established protocols for conducting health screening and their training includes thoughtful and respectful collection of health data.

School administrators assume that weighing and measuring children can be done efficiently if the process is well organized and managed, although there are no data available on how much time it takes to conduct these screenings. It does require that funds be spent to purchase equipment as well as train and supervise staff to take the actual measurements. Accurately weighing and measuring children is not just a matter of having a child step on a scale and stand against a stadiometer. The Center on Weight and Health has issued detailed instructions for collecting these data in a uniform manner [23]. Once these measurements are taken, staff can electronically calculate and record the BMI of individual students. If this information is to be communicated to parents, a process reporting needs to be developed and implemented. Schools need to consider whether the cost of carrying out these tasks is the best way to use limited resources. There is no research demonstrating that this is a cost-effective way to address the problem of childhood obesity. Schools need to consider whether they want to expend monies this way, or if it might be more fruitful to use the funds to implement strategies the CDC has identified as being key to the prevention of obesity.

Interpreting BMI data

One of the biggest problems with collecting BMI information on children is interpreting this information in terms of the weight status of an individual child. In order to assess a child’s weight, health professionals examine the child’s growth history, taking into consideration the heights and weights of the child’s biological parents. They also ask questions about the child’s eating and activity patterns [24]. Armed with this information, the health professional is in a position to determine if the child is ‘at risk of overweight or underweight’ or is ‘overweight’. Schools, on the other hand, may have only one piece of information—the child’s current BMI—to use in assessing the child’s weight status. A study conducted at the US Department of Agriculture/Agriculture Research Service Children’s Nutrition Research Center that investigated the adequacy of using BMI to assess the weight of children in a multiethnic population found that 17% of the youngsters with normal percentages of body fat were incorrectly classified as at risk of overweight or as overweight [25]. These researchers expressed concern that schools may falsely mislabel a needless number of children as overweight based on BMI screening [26].

In the United Kingdom, the collection of these data is specifically for the purpose of population monitoring. Height and weight measurements are entered into a computer data management program for aggregation and calculation of population statistics. School personnel are actively discouraged from calculating BMIs for individual students. UK
experts state, ‘There is still discussion as to the appropriateness of BMI as a measure of overweight and obesity, especially in children. At the level of an individual child, a single BMI measure is difficult to interpret and needs to be used in conjunction with other findings if it is to assist with the management of overweight and obesity’.

**Communicating BMI information to parents**

The UK guidelines state that ‘Parents have a right to know their child’s height and weight measurements. Although these should not be given routinely they should be given if requested. PCTs should develop a system for responding to parental requests for height and weight values’.

The US MCH guidelines on contacting parents states, ‘All communication should be respectful in its tone. Be certain that all written and oral communications with families are available in a language, literacy level, and level of understanding that will be understood. Venues of communication for health, mental health, and safety matters can include telephone calls, e-mail, home visits, “meet the teacher” evenings with time to address students’ issues, and appointments at school that are scheduled during times that are convenient for families. Teachers, school staff, and school administrators should receive training on communicating with diverse populations and on effective communication techniques’. This raises the concern as to whether or not schools have access to resources that will enable them to prepare staff to deal with an issue as emotionally laden as childhood obesity, which even pediatricians have had difficulty addressing [27]. Of particular concern is the fact that school staff may hold negative attitudes about obese children, viewing them as more emotional, as less tidy and less likely to succeed and as having different personalities and more family problems than the non-obese [28].

Widespread discriminatory attitudes and actions toward obese children and adults pose a barrier to establishing the ‘inclusive, respectful climate’ called for by the ‘Health, Mental Health and Safety Guidelines for Schools’. Even if schools do not conduct BMI screening, there is a need for interventions that will impact attitudes about obesity. Recently, a Web-based intervention was found to be effective in communicating messages regarding size acceptance that resulted in long-term improvements in the attitudes of teachers [29]. This appears to be a cost-effective way to reach large numbers of teachers and educate them about size discrimination.

Perhaps the most critical question to ask about BMI report cards is what do parents do after receiving them. To date, there has only been one published study evaluating parental reaction to a school health report card containing information about a child’s weight status [30]. The study was carried out in Cambridge, MA, USA, with a group of ethnically, racially and linguistically diverse families. Families were mailed a personalized health report card that had their children’s height, weight and weight status (overweight, at risk of overweight, healthy weight and underweight) recorded along with fitness test results and health education materials. The materials promoted the adoption of a daily ‘preventive lifestyle’ that included $\leq 2$ hours of TV or videos, 1 hour of physical activity and five servings of fruits and vegetables. Starting 1 week after these materials were sent home, trained interviewers were able to conduct telephone interviews with 45% of the families who were sent the report cards. There were 57 families whose children were categorized as overweight (BMI $\geq 85$ percentile) and 62 families whose children were categorized as having healthy weights (BMI from 5 to 84.9 percentile). About half of the families with overweight children indicated that they were somewhat or very concerned about their child’s weight status. Concerned parents were more likely to plan weight-control strategies than less concerned parents. They were not more apt to adopt the preventive lifestyle behaviors described in the health education materials than were parents of children in the healthy weight range. Almost 20% of the families with an overweight child reported planning diet-related activities with the child, and 40%
of these families did not plan to seek medical advice about these activities. Of even greater concern is the fact that a small number of parents who had non-overweight children reported their intent to limit their child’s food intake. The researchers noted that ‘Regardless of the amount of anti-diet information included in our materials, it still seems to be a typical response for parents to try to control their children’s weight through dieting. Since this is contraindicated by most experts in the pediatric overweight field, it highlights the need for further education for parents on how to appropriately curb and prevent weight gain in their children’.

Potential harm

Parental promotion of dieting

Further research is needed in terms of the reactions of parents to the news that their children are overweight. In the only study examining the reaction of parents to a BMI report card, a significant number of parents responded to the news that their children were overweight by putting the children on calorie-restricted diets. Limiting the caloric intake of children who have not gone through puberty is problematic in that it can result in stunting growth in height [31]. It may also lead to behavioral problems such as sneaking food, hiding food and overeating when there is unlimited access to food [32, 33]. Teenagers are apt to view dieting as an effective means of losing weight. But self-reported dieting during adolescence has been found to increase the risk of overweight and obesity in this population [32, 34]. This may be due to cycles of overrestriction and then binging.

Increased stigmatization of obesity

Another problem with labeling a child as overweight is the stigma associated with being ‘fat’. The reason children are so fearful of becoming fat has little, if anything, to do with the health risks associated with obesity. Instead, it is based on early awareness that having a fat body is socially unacceptable in our culture. Studies in children as young as 5 years find that they have already absorbed our cultural bias against fat people [35]. Latner and Stunkard [36] recently published data showing that stigmatization of fat children by other children has increased by 41% in the last 40 years. Appearance-related teasing is the most common form of teasing among children [37, 38]. Strauss and Pollack [39] have stated that ‘few problems in childhood have as significant an impact on emotional well-being as being overweight’. As a consequence, overweight children are at higher risk of low self-esteem, depression and social isolation [40].

Lowered self-esteem

Self-esteem is generally defined as ‘how much a person likes, accepts and respects him/herself overall as a person. Self-esteem is shaped not only by a child’s own perceptions and expectations, but also by the perceptions and expectations of significant people in her/his life—how s/he is thought of and treated by parents, teachers and friends. The closer a child’s perceived self comes to the child’s ideal self, the higher the child’s self-esteem’.

Self-esteem plays a central role in a child’s motivation and achievements in school, athletics and social relationships. It influences the child’s risk of becoming involved in drug or alcohol abuse and sexual activity, and vulnerability to unhealthy or negative peer pressure.

By the middle years of childhood, a youngster needs a positive sense of self to do well in the world outside the family—that is, achieving in school and interacting successfully with his/her peers. Self-concept at this age will be a major influence on accomplishments, social interactions and emotional status throughout the rest of adolescence and adult life [41].

Research has shown that young girls who perceive themselves as overweight or who actually have heavier weights are particularly vulnerable to low self-esteem. When asked, most overweight girls report direct and intentional stigmatizing experiences with peers, family members, employers and even strangers [42]. The most commonly mentioned place where this occurred was the school setting, followed by the home. Labeling a child
or adolescent as overweight may increase the risk that this youngster will be exposed to hurtful experiences that negatively impact self-esteem. On the other hand, ignoring the problem may lead to increased weight gain and further body dissatisfaction.

**Increased body dissatisfaction**

There is concern that BMI screening will increase social pressure on children to achieve the ‘perfect body’. Because they know that being fat is unacceptable, children have become increasingly preoccupied with their body size and shape. This has been substantiated in an ever-expanding body of literature on body image concerns in children and teenagers [43].

Youngsters place great importance on being thin and many desire thinner bodies even though their bodies fall within ‘normal’ ranges. Girls and young women routinely engage in ‘fat talk’ disparaging their normal weight bodies for the purpose of fitting in socially [44]. Parents, peers and the media all contribute to the body image concerns of children and teenagers.

Recent research on BMI and suicide ideation/suicide attempts revealed that adolescent perceptions of body weight may be more important than actual weight or BMI. Regardless of BMI, perceiving oneself as being very underweight or very overweight was associated with greater odds of suicide attempts [45]. Higher levels of body dissatisfaction and body image concerns among youth are also associated with lower global self-worth, poorer self-esteem and greater dissatisfaction with other aspects of life [39, 46]. Body dissatisfaction has emerged as one of the most potent risk factors for the onset of eating disorders [47]. BMI is correlated with body dissatisfaction in adolescents. This begins in childhood with reported small but significant correlations between BMI and body dissatisfaction in 5- to 9-year olds. The size of the correlation increases with age [48].

**Disordered eating**

Children and adolescents who find themselves labeled as overweight by BMI screening may be motivated to take desperate action to reduce their weight. Eating disorders and disordered weight-control behaviors, such as vomiting and using laxatives and diet pills, are major public health concerns in adolescent girls and may be on the increase in adolescent boys. The results of the 1999 Youth Risk Behavior Survey show that a significant number of high school students have abnormal eating and weight-control behaviors [49].

**Obesity prevention and health promotion**

There is concern that obesity prevention and health promotion programs that can cause harm are being used in schools or are being developed [50]. Larkin and Rice [51] found that ‘healthy eating, healthy weight’ messages integrated into middle school health curriculum can be potentially harmful if they increase anxieties about body weight, ignore the multiple causes of eating disorders, marginalize issues most relevant to girls and ignore dilemmas associated with physical development. Neumark-Sztainer [52] provides strong conceptual and practical arguments for integrating schools’ efforts to prevent overweight and eating disorders. The Society for Nutrition Education has proposed further expansion of this concept in the belief that it is essential that all programs related to health promotion be evaluated with respect to their impact on the total health of youngsters which includes physical, psychological and social well-being [53]. It is critical to understand that obesity prevention and health promotion programs can actually harm one aspect of health while attempting to improve another. The goal of all programs should be to improve total health without exception. Health professionals must strive to ‘do no harm’, not ‘do as little harm as possible’.

**Summary**

In summary, school BMI screenings are not necessary to monitor the prevalence of pediatric overweight at the national level in the United States,
since there are surveys in place to accomplish this task. However, BMI screening may be essential in order to accomplish this task in other countries like the United Kingdom. Even in the United States, school-level BMI screenings could provide valuable information for monitoring trends at the state and local levels where data are limited. For example, in California, such data have been organized by assembly district and used to influence legislation to prevent overweight by improving food and activity environments [54].

Screening BMIs may also be a useful tool to evaluate the long-term impact of schools implementing key strategies to prevent the onset of pediatric overweight. Health professionals who are trained and qualified to organize and manage BMI screening in a sensitive and caring manner are school nurses. Funds will need to be allocated for the recruitment and training of non-professional staff to assist with this task. If parents are to be notified, school staff will need to learn how to deal with the emotionally laden topic of children being labeled overweight. Schools need to make sure that there are treatment programs available to help these children. Whether or not BMI screening takes place, schools need to have an inclusive and respectful school climate where size discrimination is not tolerated. To avoid doing harm, efforts to improve the health of students should enhance physical, psychological and social well-being.

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**Conflict of interest statement**

None declared.

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