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A review of the literature on the school related contributing factors to childhood obesity

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A REVIEW OF THE LITERATURE ON

THE SCHOOL RELATED CONTRIBUTING FACTORS TO CHILDHOOD OBESITY

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ABSTRACT

This project reviews the literature related to the epidemic of childhood obesity. It looks specifically at the school related contributing factors to obesity. This review provides information on school lunches and the socioeconomic status of students. The literature review looks at the lack of physical activity and its relationship to obesity as well. This review ends by providing examples of how schools implement reform to benefit the health of their students.

Introduction

Childhood overweight is an increasing public health concern, affecting as many as 20% to 25% of children in the United States (Wolfe 1994).

This epidemic has parents and schools concerned. Their concern is focused around the fact that children spend a majority of their day at school. All parties involved want to know what is causing this trend and how it can be stopped. The question that needs to be addressed by parents and schools is: what are the school related contributing factors to childhood obesity and what is being done to address this issue? Schools are an ideal setting to look into because they contain all the information and resources needed.

Many factors are behind the trend, but there is evidence that the meals served in many schools contribute to poor nutrition and obesity (Grainger 2007). The National School Lunch Program (NSLP) and the items that students can choose from a la carte menus are negatively affecting student's health and weight. For example, many students are consuming too many calories in the meals provided by schools. Students are also not consuming adequate fruits and vegetables. Most of a child's food intake at school goes unregulated. This lack of regulation is causing health problem in many students.

However, not all students are affected by the same eating circumstances. The socioeconomic status (SES) of students may also affect their weight and health says Dr. Vieweg (2007) and associates of the Southern Medical Journal. The SES of students affects the quality and quantity of food they get at home and at school. Low SES students usually get free or reduced price lunches, therefore eating the NSLP lunch that is provided more frequently. The NSLP lunch may not always be as nutritious as the USDA suggests it should be, consequently

causing more frequent health and weight problems in these low SES students. There are, however, people that have different views on low SES and obesity in children. Dr. Wojcicki (1994) and partners of the American Journal of Public Health believe that the near poor SES students are most at risk, not the general poor as Dr Vieweg suggests.

Lack of physical activity is another factor in the obesity epidemic. Many schools do not require any kind of physical activity at all. Research shows that vigorous physical activity can lead to weight loss and promotion of healthy lifestyles. However, there is also research that shows that some physical education (PE) classes are not meeting the health needs of students even though they are participating in physical activity.

Many parents and schools can see that something needs to be done to stop the obesity epidemic. Some schools are looking at short term, quick fixes to improve the quality of food and health in their schools. Some schools have completely revamped their entire menu and way of looking at physical education. Some schools still choose to do nothing concerning their student's health.

School food health, SES, and lack of physical activity, are contributing factors and working elements of childhood obesity. Reform, awareness and education are some key factors in reversing this situation and helping our children succeed academically and physically in life.

Literature Review

School Food Health

Children spend a significant portion of their young lives at school and, as a result, consume many meals there. Almost three quarters of school children eat a National School Lunch Program (NSLP) lunch, and consume about one-third of their total calories from this meal (Whitmore 2004). The National School Lunch Program was developed in 1947 to ensure that American schoolchildren had access to a nutritionally balanced and affordable lunch. When the NSLP was initially developed, malnutrition due to too few calories was the primary health concern. Paradoxically, six decades later many children are still suffering from malnutrition, although now the primary concern is with children consuming too many calories, and the accompanying increase in the rates of childhood obesity (Schwartz 2007). The NSLP now faces serious scrutiny over the fact that students consume too many calories from these meals.

In a nationwide assessment, the USDA found that an average lunch served in 1998-99 met its dietary guidelines of fewer than 30% of total calories from fat and less than 10% from saturated fat in only one out of seven schools (Grainger 2007). Previous studies have established that the school lunch program lunches often fail to meet nutrition requirements, and have an especially high fat content (Whitmore 2004).These are unfortunate statistics that show the poor state of our schools lunch programs.

A study conducted by Whitmore (2004) shows that children who consume NSLP lunches are more likely to be obese or overweight. To gather data Whitmore employed a panel data set to follow children over time, and found that children who consume school lunches are about 2

percentile points more likely to be obese than those who brown bag their lunches. Analysis of food diary data suggests that school lunch eaters consume between 40 and 120 calories more at lunch than brown baggers, but both groups consume the same number of calories the rest of the day. A simulation of the relationship between weight and caloric intake among children indicates that as few as 40 additional calories per day could lead to a 2 percentage point difference in obesity rates (Whitmore 2007).

Many schools are serving students too many calories because the NSLP only suggests what they should serve. Schools simply don't follow the NSLP guidelines because they are just that, guidelines. However, Metos (2007) of the Journal of School Health feels that if current policies were worded differently (mandate vs. recommendation) they would lead to healthier students and a better food environment. Some schools also don't follow the guidelines because schools today are not properly equipped to prepare the nutritious foods that are suggested in the guidelines. School food service directors often must focus on ease of preparation rather than healthy options because they lack both the skilled staff and facilities necessary to do more (Grainger 2007).

According to the NSLP guidelines, elementary students *should* be offered 5 components in their meals. The components are: a 2 oz meat/meat substitute selection, 8oz of milk, 1 serving of grain, and two servings (3/4 cup) of a fruit/vegetable (Schwartz 2007). Many schools are not offering all of these selections however as was discussed above due to varying reasons. This is not to say that all schools are not following the NSLP guidelines. Some schools do offer the 5 components, but there is still a dilemma when it comes to students getting all the nutrition that they need. Schwartz (2007) feels that it is important to note that although all components must be available, children are only required to take three of them. This provides choice and flexibility,

but also creates a situation where some children who buy lunch will not benefit from certain key nutrients. In other words, many schools offered options that were consistent with nutritional standards, but the average lunch actually served to the children was not. Even if the right nutrition is made available, students may still choose to eat only what they want skipping healthier options.

The NSLP is not the only part of school lunch that is being seriously looked at however. Another part of school lunch that is under scrutiny, due to the rise in obesity and health problems, is the a la carte option or snack bar. These non-regulated food items are being eaten for lunch instead of or in addition to the NSLP lunch in many schools. Metos (2007) tells us that in 2000, food and beverage items were sold to children from vending machines, school stores, and a la carte lines in 43% of elementary schools. Not surprisingly the nutritional quality of these foods is poor, mostly high in fat and sugar.

A la carte items seem to be more appealing to students for a variety of reasons. Dalton (2004) gives accounts of students sharing why they prefer a la carte, vending machine and snack bar items to the NSLP lunch. One student stated, “The lunch lines are too long. I just buy a big bag of chips and a candy bar from the school store.” Also many students said that they simply don’t eat the NSLP lunch because it is unappealing. What is appealing to them however, is fast food. “Major fast food chain products are being served in a substantial number of schools because that is what students want” (Grainger 2007). Another shared, “We have to buy drinks because the fountains are so gross.” Blum of UC Berkeley (2005) says, increases in soft drinks and fruit drinks in the diet are also linked to an increase in caloric intake in children. Consuming soda and other sugary drinks is another factor that is leading to early obesity.

The drink vending machine option is something that is not thought of as often when it comes to the health of students. However, research by Blum (2005) shows that children who consume diet soda are more likely to be overweight. Blum examined children for 2 years looking at the shifts in drinking habits. Subjects were categorized by BMI Z-score as normal weight, overweight, gained weight and lost weight. Significant decreases in milk and increases in diet soda were found over two years in all subjects. Diet soda consumption was the only type of beverage associated with year 2 BMI Z-score, and consumption was greater in overweight subjects and subjects who gained weight, as compared to normal weight subjects at two years. Additional longitudinal data examining associations between beverage consumption and BMI is needed in children and adolescents, as consumption of regular and diet soda has become more of a social norm.

The a la carte option may be unhealthy for students; however some schools still choose to keep alternative food options available for financial reasons. Tartamella (2004) believes: Stretched to the limit financially, schools have turned to money making fast food purveyors--MacDonald's, Taco Bell, KFC and Pizza Hut are among them—to feed their students at lunchtime. However, the children don't mind this at all because they prefer this type of food to more nutritious options. To ease their budget problem, more than ¾ of all US schools have entered into exclusive, often secret, vending machine contracts with Coca-Cola and Pepsi.

Schools have begun to be heavily criticized for not providing healthier food choices and guiding students toward healthy life long eating habits (Grainger 2007). Whether it is the NSLP or a la carte menu that is being looked at, something needs to change to keep students healthy. Especially when not all students can avoid eating the unhealthy foods that schools serve.

Socioeconomic Status (SES)

Many students in the school system cannot avoid eating a school lunch because they are a part of the lower economic class. Children that fall into the lower class often receive free or reduced price lunches. The lunches they receive are the NSLP lunches. Hofferth (2005) concludes that food programs (like the NSLP) have received widespread support from the public because they directly benefit children. Yet recent media reports have suggested that such programs may have the potential to actually provide too much food to children and, therefore, increase their chance of being overweight. Emerging research shows that there may be a link between SES and obesity in children. The theory that low socioeconomic status and obesity are linked has long been researched in adults. The link between the two for children is a relatively new undertaking. As more and more children fall into the overweight or obese category more interest and research take place.

In a review by Vieweg (2007) many connections to low SES and obesity are shown. Vieweg found that Moore et al. looked at the affects of race, sex, and SES on changes in youth overweight over a 7 year period in a longitudinal study of cardiovascular risk factors. Over the study period BMI percentile increased significantly. Neither sex nor race predicted this increase, but SES did. Vieweg also found that McMurry described the influence of physical activity, SES, and race on weight in adolescents. Overweight was found to be related to watching television on nonschool days in low SES children.

Vieweg (2007) and colleagues also did a study of their own to connect SES to obesity. They found that children in the Chesterfield VA county public schools had an unacceptably high prevalence of at risk for overweight obesity. Low SES appeared to be an important contributor to Chesterfield County problems. They felt that their literature review supported SES as a powerful determinant of obesity among children and adolescents in this county.

Although Vieweg and colleagues found a connection between SES and obesity, Hofferth (2005) feels that the connection may not be so simple. Hofferth and Curtin examined weight and height, calculating Body Mass Index (BMI) scores, of 1,268 children between the ages of 6 and 12. A number of these children participated in federally subsidized school lunch or breakfast programs, either for free or for a reduced or subsidized price. The sample included children from high income groups, many of whom regularly bought a subsidized school meal.

Hofferth (2005) found that children in the poorest families are actually less likely to be overweight and have lower BMI's than most other children. Children from high income families were also less likely to be overweight. In contrast, the study found that children from families with incomes just over the poverty line, the near poor, are the ones most at risk of being overweight and having the highest BMI. In addition to school food programs, these children in near poor or working class families may have more money to spend on food in school vending machines or the snack bar.

The study results also suggest that generalizing from adult samples to children regarding food intake, nutrition, and overweight is not good practice. The effects of programs on children should be studied separately from their effects on adults (Hofferth 2005).

The studies by Vieweg and Hofferth were both done on a general population of students. Their studies did not focus in on any specific racial group. However studies done by Crawford (1999) and Wang (2006) zeroed in on SES and obesity relationships in African American students. Crawford compares the obesity rates between Black and White females ages 9-10, and Wang looks exclusively at Black students.

The study done by Dr. Crawford (1999) and team looked at this topic because most of the studies that found SES inversely related to childhood obesity examined predominantly white populations, and it was not known if the findings could be generalized to African-American children. After careful analysis of data from the Growth and Health Study, it became evident that the association between childhood obesity and socioeconomic factors was different for girls depending on their race. For the white girls the prevalence of obesity dropped with higher parental education and higher household income. But, surprisingly, we found no significant correlation between these socioeconomic indicators and obesity in African-American girls (Crawford 1999).

Professor Wang (2006) and associates looked at the effect of implementing a program to help low SES students stay healthy. This study was designed to test the feasibility and effectiveness of a school-based intervention program using environmental approaches for the prevention and treatment of obesity among low-SES African-American students. Their goal was to promote healthy eating and physical activity (HEPA) through changes in students' home, school and community environments. The school physical and social environment was the primary focus of their intervention program (Wang 2006). Wang and team found that low SES in African American students and obesity did indeed coincide due to the children's poor eating preferences at home and at school. Also most of their experience thus far suggested that in

general the target community's awareness of the obesity problem was increasing, and there was good potential to gain support from school principals, classroom teachers and staff, and the parents to carry out such a comprehensive intervention program (Wang 2006).

When looking at the research by Hofferth and Vieweg, it is easy to see that SES does in some way affect the weight of a child. Vieweg offered a broad view of SES while Hofferth offered a much more direct view of low SES. Both show that SES can affect the health and weight of a child both at home and at school. Crawford and Wang also showed that there was a connection between low SES and obesity in African American students specifically. No matter the race, obesity and SES are connected.

Lack of Physical Activity/Sedentary Lifestyle

The lack of physical activity at home and at school is also contributing to the rise in obesity among children. This lack is due, in part, to the fact that the National Association for Sport and Physical Education (NASPE) guidelines are just guidelines, as was the case for the NSLP as well. For example, the NASPE *guidelines recommended* the children participate in a variety of activities and avoid extended periods of inactivity (Pangrazi 2003). Schools do not have to follow these guidelines, so they don't in most cases.

Schools today get away with providing little to no physical activity to students because the push for academic excellence is so demanding. Dalton (2004), shares that today's students are less fit than ever before, in large part because school schedules often leave out physical activity. Ironically, educators and administrators well meaning efforts to boost academic standards are partly to blame for the reduction in physical fitness, because students who are

burdened with homework and busy at computer labs have less time and energy to run around for play, or to take a gym class. Experts find that children are likely to get fat not only because they spend less energy in physical activity, but because they are simply less fit aerobically. If schools offered any type of physical activity, it would be beneficial. Any activity is better than none to stall the increasing rate of obesity among children.

Another contributor to the lack of physical activity, which is contributing to obesity, is safety. Some schools rely on recess to provide physical activity, but are wary in letting students play because of increased violence and lack of supervising staff. Dalton (2004) also tells that even in schools that have recess breaks, the amount of energetic running around has declined. Dalton shares that she observed 4th graders in an inner-city school start to "fool around" by chasing one classmate and then another; the aid blew the whistle to go in early so the kids "wouldn't fight and get hurt." Principles complain that they don't have money to hire aids to supervise children in playgrounds, yet at the same time school grounds need more supervision than in the past because parents demand increased assurance of safety.

The importance of any type of physical activity, including recess, is sometimes underestimated. Sedentary lifestyles can lead to overweight and obesity among other diseases. Kovar (2007) tells that the American Heart Association added physical inactivity to the list of primary risk factors when large population studies began confirming that a sedentary lifestyle was an important contributor to the development of several chronic diseases. Research has shown that physical activity and exercise reduce the development of high blood pressure, obesity, and high cholesterol. Additionally, programs that emphasize an active lifestyle including aerobic exercise have been successful in producing weight loss in children. Studies also suggest that childhood physical activity habits will continue into adulthood.

In a report by the American Academy of Pediatrics, Gomez (2006) reveals that children and youth are more sedentary than ever with the wide spread availability of TV, videos, computers, and video games. Data from the 1988-1994 National Health and Nutrition Examination Survey indicated that 26% of American children watched at least 4 hours of television per day, and these children were less likely to participate in vigorous physical activity. Not only are the rates of sedentary activities rising, but participation in physical activity is not optimal. Regular physical activity is important in weight reduction.

Even though schools and parents know that physical inactivity can lead to obesity, they cannot make their children active at school if they don't want to be. Another reason for less running around on school grounds is that kids are simply more sedentary and less fit and don't want to be active at recess or in physical education class (Dalton 2004). Even if schools do require some form of physical activity, it is relatively easy to be excused from it. Gomez (2006) shares that although approximately 80% of schools have policies calling for students to participate in PE, 40% of elementary schools allow exemptions from PE classes, particularly for students with permanent physical disabilities and those having religious reasons.

There are also other problems with PE requirements in schools. Requiring more PE classes seems like a logical response to the childhood obesity epidemic, but will mandating more time in gym class actually result in more exercise for kids asks Cawley (2006)? Cawley (2006) finds that even if more classes are required, not all of the class time is actually spent doing vigorous physical activity. According to a 2000 study by sports researchers Ken Hardman and Joe Marshall, and estimated 26% of PE classes in the US fail to comply with state regulations. And even when schools do play by the rules, gym classes may do little to promote exercise. The

US Department of Education has criticized PE for too often consisting of "rolling out the balls and let them play," unstructured and unmotivated class time involving vigorous activity.

Even as the rate of physical activity falls and obesity rises, both parents and schools pay lip service to the importance of physical education at school (Dalton 2004). Doing more to encourage students to participate in physical activity daily is needed. PE reform is key in helping prevent childhood obesity.

School Policy Reform

Reform in school systems regarding physical activity and the quality of NSLP lunches can be a remedy to the obesity epidemic. Physical activity needs to be promoted at home, in the community, and at school, but perhaps school is the most encompassing way for all students to benefit (Gomez 2006). Many schools and parents are also trying to change the way their children eat at school out of concern for their future heath.

In San Francisco, schools have completely revamped their entire menu and way of thinking about lunch. Wojcicki (2006) and associates conducted a study that shows how reform and rethinking helped change the lunch program in the San Francisco Unified School District (SFUSD). The SFUSD has developed district wide nutrition policies that extend beyond SB 677, requiring elimination of foods not meeting the minimal nutrition value. SB 677 is a federal nutrition standard that bans the sale of products such as artificially sweetened foods, and foods that provide less than 5% of the recommended dietary intake of each 8 specific nutrients per serving. The SFUSD nutrition standards apply to the federal student lunch and breakfast programs, all school snack bars and vending machines, students stores and fundraising sales, and

they demonstrate San Francisco's serious commitment to providing healthier school food options in schools and combating the increase in the number of overweight children. This illustrative case study of changes in the nutrition standards of the SFUSD suggests that students will choose healthier options…Due to the change in menu more students participated in the lunch program and were eating in a much healthier manner because of the changes (Wojcicki 2006).

Grainger (2007) also has done a study showing the effects on changing the food in schools to improve student health. This study was done on a school in Minnesota. Hopkins School District dramatically revamped its school food program with a commitment to providing healthy and appealing food choices to students. As the new program was gradually introduced, there was a steady increase in the nutritional quality of student food choices. Moreover, the trend toward choosing healthier a la carte food choices strengthened the longer the program operated. When both a la carte and full meals were analyzed together, students were clearly making healthier food choices (Grainger 2007).

While some schools don't want, or are unable, to take the time and money to completely change their entire lunch system, other options are available. A study by Hartstein (2007) shows that a relatively easy 6 week change in food offers can be implemented in schools with a result of healthier food choices for kids. This pilot study documented that school foodservice changes (lower-fat entrees, increased fresh fruits and vegetables and bottled water, and reduced portion sizes of snack chips and sweetened beverages) can be successfully implemented for a 6-week period and be acceptable to staff and students. However, future work should implement longer interventions, expand the goals to reduce portions of all snack/dessert food items to one serving sizes, assess cost issues, and measure student dietary intake at school and out of school to assess

whether school food environmental change was reflected in student dietary change, and ultimately biologic risk factors (Hartstein 2007).

While some schools focus on changing their enter menu, others choose to focus on smaller areas of improvement. Schwartz (2007) gives an account of a school simply offering a verbal prompt to increase fruit consumption in students. Children's fruit consumption was measured in two schools by observation. In the intervention school, cafeteria workers provided the verbal prompt, "Would you like fruit or juice with your lunch?" as the children stood in line in front of the fruit serving options. The average percentage of children who took a fruit serving was 60% in the control school and 90% in the intervention school. In both schools, approximately 80% of children ate the fruit on their tray. As a result, nearly 70% of the children in the intervention school consumed a fruit serving at lunch, while fewer than 40% did so in the control school. A simple verbal prompt appears to have a significant impact on the likelihood that children will take, and subsequently consume, a fruit serving as part of their purchased school lunch. (Schwartz 2007).

The federal government is also doing what is can to try and combat childhood obesity. The creation of the Child Nutrition Reauthorization Act (CNRA) is the government's answer to recent concerns. Metos (2007) explains that in response to the growing awareness of the school environment's influence on nutritional intake and physical activity on the nation's students, the CNRA of 2004 included a school wellness component requiring school districts to develop a wellness policy by July 2006. This law outlines 5 content areas to include in the wellness policy. 1) Goals for nutrition education, 2) nutrition guidelines for food provided at school, 3) assurance that guidelines for school meals meet the USDA guidelines, 4) a plan for monitoring the policy and 5) involvement of parents, students, representatives of the schools food authority, school

board, school administrators, and the public in the development of school wellness policy content. This experience indicates that compliance with the CNRA may be a positive step toward improving the school nutrition and physical activity environment, but it does not ensure a comprehensive or powerful policy (Metos 2007). Gomez (2006) also finds that in light of the school wellness policy, many schools are looking to modify their present PE programs to improve their physical activity standards.

The institution of wellness policies is also done in the private sector on a smaller scale. It seems that there is evidence suggesting that schools that have some sort of wellness plan tend to have healthier students. Dr. Veugelers and Fitzgerald (2005) did a study that compared excess body weight, diet, and physical activity across schools with and without nutrition programs using multilevel regression methods while adjusting for gender and socioeconomic characteristics of parents and residential neighborhoods. They found that students from schools participating in a coordinated program that incorporated recommendations for school-based healthy eating programs exhibited significantly lower rates of overweight and obesity, had healthier diets, and reported more physical activities than students from schools without nutrition programs (Veugelers 2005).

Looking more closely at the physical education aspect of school reform, Dalton (2004) feels that one way to get attention and respect for physical activity is to revamp the old “PE for athletes” into “PE for fitness.” This new PE philosophy encourages gym teachers to focus at least as much on poorly conditioned kids as they do on the students with more athletic ability. It is important to meet the needs of all students, no matter their skill or ability, to keep them healthy.

The federal government is also helping out when it comes to physical fitness. Tartamella (2004) also found that the US government has made a commitment to get kids moving. For example, the Center for Disease Control recently launched VERB, a TV ad campaign designed to encourage 9-13 year olds to become more physically active. The government is also making a major push to encourage kids to walk to school. The walk to and from school gives kids a chance to gather their thoughts and stretch out their legs, and it also may prove to be one of the most effective remedies for the epidemic of childhood obesity.

Whether schools are completely revamping their lunch policies, encouraging physical fitness or implementing health policies, it is clear to see that whatever they are doing is helping children in the battle against obesity. School lunch and PE reform is leading to healthier kids who make healthier choices. Children that are aware of their health are going to be less likely to be obese because they know the consequences of their choices.

Conclusion

To answer the question, what are the school related contributing factors to childhood obesity and what is being done to address this issue?, which was posed earlier, we can look at school food health, SES, lack of physical activity and school policy reform. The NSLP began as a way to keep students healthy and nourished. Unfortunately, today school lunches provide too many calories to children which cause health problems and obesity. There are guidelines for schools to follow when considering nutrition, but they are not mandatory. This lack of enforcement is causing schools to serve food that is harmful to their student's health.

Socioeconomic status and the food made available to lower income children (NSLP lunch) is also another factor that affects a child's health and obesity. The studies by Hofferth, Vieweg, Wang, and Crawford all show that SES is a determining factor in obesity. Children with low SES cannot escape the food that is served in schools. School lunch along with outside factors, such as family food preferences, have caused many students to become obese or suffer from other health problems related to overweight.

The lack of physical activity in schools today is also causing students to become obese. Very few schools require physical activity. Only 10 states require high school students to take 4 years of physical education (Cawley 2006). Schools are pushing PE out due to funding issues and the drive for academic excellence. They don't realize however that they are overlooking the most important issue, student health. Students need to be physically active or they could fall victim to obesity.

Many schools are seeing that students are overweight and becoming obese and are trying to find ways to fix this problem. Some schools have successfully implemented complete lunch

reform programs that are working to change types of food that children eat. Other schools are working on rethinking the importance of PE. Also the federal government has stepped in with a plan called the Child Nutrition Reauthorization Act to implement change. All of the programs have shown success in helping students become healthier.

All of these are contributing factors to childhood obesity. They all point to the fact that obesity is a problem in America. More and more students are becoming obese and overweight. Some schools are on the track to reform, but most are not. The CRNA and other reform efforts are a step in the right direction for the health of our students. The goal needs to be for all schools in America to want to help students succeed both academically and physically.

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