

Editor's Perspective Article: Nutrition, Exercise, and Sleep: Physiological Considerations in the Classroom for Alternative Certification Teachers

Brian R. Evans
Pace University
bevans@pace.edu

Abstract

Proper nutrition, adequate amounts of physical activity, and sufficient amounts of sleep are three important variables for healthy children. Alternative certification teachers quickly enter the classroom at the beginning of their programs and may encounter disengaged students who lack the energy needed for quality learning and achievement. Commonly, classroom management issues are the biggest challenges faced by new teachers in alternative certification programs (Evans, 2010). Children who receive proper nutrition, adequate amounts of physical activity, and sufficient amounts of sleep could be more receptive to learning and have the energy levels needed for dynamic and engaging classroom experiences. This article addresses nutrition, exercise, and sleep for students in the context of new teachers in alternative certification programs. Alternative certification teachers in the New York City Teaching Fellows program were surveyed to determine their attitude toward student health issues in the schools and it was found that teachers indicated student health issues to be important to them.

Keywords: *alternative certification teachers; student health; student engagement; teacher attitudes*

The views expressed in this article are the editor's views and do not necessarily reflect the views of the National Association for Alternative Certification.

As many new alternative certification teachers enter the classroom this September they may be dismayed to find many of their students unfocused, distracted, inattentive, and unenergetic. As new teachers with only summer teacher preparation behind them, they may become easily discouraged by the challenges faced in their new classrooms. While there are many factors affecting student achievement such as poverty, problems at home, poorly funded schools, lack of qualified teachers, and past negative schooling experiences, student physiological states can have an impact on learning.

Previous research has found new teachers cite classroom management as one of the biggest issues in their teaching (Cruickshank, Jenkins, & Metcalf, 2006; Veenman, 1984), and this was also found to be true for alternative certification teachers (Evans, 2010). An emphasis on better nutrition, exercise, and sleep may lead to an increase in student receptiveness to learning and better overall concentration. Increasingly, alternative certification programs are preparing many of the new teachers who will be entering the classroom. For example, the New York City Teaching Fellows (NYCTF) alternative certification program “grew from about 1 percent of newly hired teachers in 2000 to 33 percent of all new teachers in 2005” (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007, p. 10) and NYCTF teachers currently account for 11 percent of all New York teachers (NYCTF, 2012). A call for better eating habits, physical activity, and sufficient sleep for school students is certainly not new, but given the increasing prevalence of alternative certification teachers in the classroom, particularly in high-need urban classrooms, new alternative certification teachers entering the classroom may find themselves struggling to engage uninterested students.

Student Health

Food Choices in Urban Environments

The dietary choices in less affluent urban neighborhoods have been shown to be particularly unhealthy with deficient availability of fresh vegetables and fruits (Hosler, Rajulu, Fredrick, & Ronsani, 2008), but a plethora of fast and junk food choices (Baker, Schootman, Barnidge, Kelly, 2006; Block, Scribner, & DeSalvo, 2004), which makes the health problem particularly acute in less affluent urban environments. Hosler et al. (2008) found less availability of fresh vegetables and fruits in urban minority areas compared with more availability in other areas. Block et al. (2004) found 2.4 fast food restaurants per square mile in predominately Black neighborhoods compared to 1.5 restaurants per square mile in predominately White neighborhoods in New Orleans. Fewer supermarkets were found to be available to people in lower-income neighborhoods compared to the availability in middle class neighborhoods (Morland, Wing, Diez Roux, & Poole, 2002; Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007).

Physical Activity

The ubiquity of electronic devices (i.e., televisions, video games, and computers) means children are less engaged in outdoor physical activities, such as playing sports, riding bicycles, and walking. Hu, Li, Colditz, Willett, and Manson (2003) found strong evidence that sedentary behaviors, such as long periods of watching television, contribute to obesity and diabetes. Hu et

al. (2003) recommended reduced levels of television watching to increase health. Television watching in particular resulted in lower metabolic rates than other sedentary activities such as reading, writing, and playing board games. Vandewater, Shim, and Caplovitz (2004) found children who weighed more spent a greater amount of their time watching television and playing video games than children who weighed less. Must and Tybor's (2005) longitudinal study on sedentary behaviors, such as watching television, talking on the phone, and going online, found a relationship between sedentary behavior and weight gain. In contrast, physical activity could contribute to mental alertness needed during the school day, and it has been shown that exercise can increase happiness and self-esteem in children (Strauss, Rodzilsky, Burack, & Colin, 2001).

Sufficient Sleep

Additionally, the same electronic devices that result in sedentary behavior may contribute to children staying up later into the night and not getting the sufficient amount of sleep required for optimal functioning. Dworak, Schierl, Bruns, and Struder (2007) found playing video games may stimulate teenagers' minds before going to sleep and therefore increase the time needed to fall asleep and limit the quality of sleep obtained. Violence on television and in video games may disrupt sleep in young children (Garrison, Liekweg, & Christakis, 2011). Wolfson and Carskadon (2003) found lack of sufficient and quality sleep was negatively associated with academic performance.

Childhood Obesity: Relationship with Deficient Diet, Exercise, and Sleep

Childhood obesity has been on a continuous rise in the United States over the last few decades and has been on the rise in much of the developed world (Ebbeling, Pawlak, & Ludwig, 2002). It is now estimated that 17% of children in the United States between ages 2 and 19 are obese, which is almost triple the prevalence of childhood obesity in 1980 (Center for Disease Control, 2012). The rise in childhood obesity can be attributed primarily to the food choices children and parents make and the amount of physical activity in which children engage on a daily basis. Children are eating unhealthy food at alarming rates (St. Onge, Keller, & Heymsfield, 2003) and decreasing their physical activity in favor of television, video games, and the computer. St. Onge et al. (2003) found a 300% increase in consumption of fast food by children between 1977 and 1996. Additionally, insufficient sleep has been shown to increase the probability of weight gain (Van Cauter & Knutson, 2008).

The large intake of high calorie but nutrient deficient foods, combined with an increasingly sedentary lifestyle and insufficient sleep, not only affects health and happiness in younger children, but also forms the foundation for unhealthy habits in adult lives. However, poor health and the onset of disease later in life are not the only problems experienced by many children in the United States. The highly processed foods consumed by school children contain high amounts of refined sugars and white flours, which could have negative effects on student attention and energy needed for classroom engagement (Wesnes, Pincock, Richardson, Helm, & Hails, 2003). Wesnes et al. (2003) found breakfast with complex carbohydrates helped maintain mental performance throughout the day while breakfast consisting of a glucose drink, or no breakfast at all, did not.

Limiting Sugar, Salt, and Fat

Sugar, salt, and fat currently make up a disproportionate amount of the American diet. While sodium, which is found in salt, and healthy fats, such as fat from nuts and seeds, are essential for optimum health, Americans over consume to the point of jeopardizing their health. High quantities of sugar, salt, and fat can be found in processed foods commonly consumed by many American children.

It is quite natural that people crave sugar, salt, and fat. Humans evolved to enjoy sugar perhaps because sugary food items were rare in nature and could be associated with necessary vitamins, minerals, fiber, and antioxidants found in many sweet fruits, such as berries and bananas. Sweetness may have also been a way for early humans to determine that a food was safe and not poisonous to eat.

Sodium is necessary for proper bodily functioning, and has also been rare to find in nature throughout human evolution. Adults need about 500 mg of sodium each day and more is needed for athletes. However, Americans consume too much sodium in their diets mainly through salt in processed foods. The American Heart Association (2012a) estimates Americans consume 75% of their sodium from processed foods. While the American Heart Association recommends adults consume between 1500 and 2300 mg of sodium each day to be safely above the 500 mg needed for proper bodily functioning, American adults consume on average over 3400 mg of sodium each day, which could increase excess fluid in the body and lead to high blood pressure and cardiovascular disease (American Heart Association, 2012a, 2012b). Reducing the amount of processed foods in the diet could reduce the intake of sodium.

Fats contain about nine calories per gram while protein and carbohydrates contain about half that amount. This means from an evolutionary perspective fats were a good choice because when food was in short supply fats were economical as they provided more energy than protein and carbohydrates did per part. An important fat in which many children and adults may not receive enough is omega 3 fatty acids found in flax seeds and walnuts. The American diet consists of large quantities of omega 6 fatty acids, but the proportion between omega 3 and 6 should be closer to a 1:1 ratio for optimal health. The recommendation is for American children and adults to consume more omega 3 fatty acids and reduce the amount of omega 6 fatty acids consumed.

While it is natural to want to consume large quantities of sugar, salt, and fat, it is important to place limitations on these items in the diets of children given the abundance of sugar, salt, and fat in modern life. The habits children form in childhood are often sustained throughout their lives and lead to many health complications as they age. Unprocessed whole food plant products should be the basis for a child's diet and processed foods should be reduced from the diet as much as possible. In the next section Maslow's Hierarchy of Needs will be addressed in a health context.

Hierarchy of Needs and Physiological Considerations

Twentieth century psychologist Abraham Maslow developed his well-known pyramidal Hierarchy of Needs in 1943 (Maslow, 1943), which establishes prerequisite conditions for effective learning. Without the basic needs met learning would be hindered (Slavin, 2009). At the base of the pyramid are the physiological needs, which include oxygen, water, food, and sleep. Second are the safety needs, which include a sense of physical security as well as security of resources. Third are the belonging needs, which include a sense of belonging with family, friends, and community. Fourth are the esteem needs, which include confidence, self-esteem, respect from others, and a sense of worth. Fifth is the top stage of self-actualization.

According to Maslow, lower stages needed to be satisfied before higher stages could be met. For example, people who are not having their basic physiological needs met (e.g., starvation) will not be too concerned for safety, the next level, because obtaining food is the top priority. Similarly, the lower levels of the pyramid must first be met to satisfaction before attaining full engagement in educational pursuits. While many children obtain enough food to eat, perhaps too much in many cases, many are not receiving the proper nutrition needed to satisfy the first stage. Similarly, physical activity may help develop a better sense of esteem for children, and thus affect them in the fourth stage, self-esteem (Strauss et al., 2001). The current food choices made by many children and parents, and the lack of physical activity and sufficient sleep, could hinder student achievement in school. The next section will address the attitudes of one cohort of alternative certification students toward student health issues.

Attitudes toward Student Health in an Alternative Certification Program

New York City Teaching Fellows (NYCTF) is a large alternative certification program developed in 2000 by the New Teacher Project and New York Department of Education to fill the large teacher shortage in New York (Boyd et al., 2007). At a medium-sized partner university in New York, 75 NYCTF teachers were surveyed using the Student Health in the Schools Instrument (SHSI) to determine their attitudes toward student health in the schools in their action research methods course in the spring 2012 semester. The SHSI is a 14-item researcher-designed instrument using a 5-point Likert scale with choices ranging from strongly disagree, disagree, neutral, agree, to strongly agree (see Table 1).

Table 1
Survey Results for Attitudes toward Student Health in the Schools

Student Health in the Schools Instrument (SHSI)	Mean	SD
1. It is important for students to eat healthy food in school.	4.81	0.392
2. Soda should NOT be permitted into the school cafeteria and vending machines.	3.92	1.171
3. Students should not be served candy or other junk food in the classroom.	3.16	1.263
4. The school cafeteria should be required to serve only healthy foods and eliminate unhealthy foods such as hamburgers, pizza, and French fries.	3.28	1.268

5. Health class is an important part of the school day.	4.28	0.689
6. Teachers should talk to parents about encouraging healthy behavior.	4.03	0.944
7. It is a responsibility of the teacher to model healthy behaviors in the classroom (e.g., the teacher eats healthy while in the school).	3.56	1.118
8. All teachers should teach healthy habits to students.	4.12	0.821
9. Students should NOT be given word problems that reflect unhealthy habits (e.g., figuring out how much money is needed to purchase a fast food item).	2.43	1.068
10. Physical education should be an important part of the school day.	4.77	0.509
11. Students should engage in after school sport activities.	4.08	0.866
12. Students should be restricted on their television watching, videogame playing, and Internet browsing time at home.	4.00	0.973
13. Students should be given less homework to encourage more time for outdoor activities and sufficient sleep at night.	2.69	0.986
14. Teachers should encourage parents to establish a “bedtime” each night so that students receive sufficient sleep.	4.17	0.964

Note. $N = 75$

An independent samples *t*-test was conducted to determine if the participants had significantly better attitudes toward student health issues compared to a neutral value coded as “3” on the survey sheet. The results of the independent samples *t*-test (two-tailed) revealed a statistically significant difference between actual attitudinal scores ($M = 3.81$, $SD = 0.464$) and neutral scores ($M = 3.00$, $SD = 0.000$) with $t(74) = 15.066$, $p = 0.000$, $d = 2.47$ (equal variance not assumed). It was found that NYCTF teachers overall believed student health issues to be important to them, which means they may be receptive to help improve habits that affect student health. The items ranked highest included the importance of students eating healthy, physical education, and health class. Other highly rated items included encouraging parents to establish a “bedtime” each night so that students receive sufficient sleep, teaching healthy habits to students, student engagement in after school sports activities, teachers talking to parents about encouraging healthy behavior, and restrictions on student television watching, videogame playing, and Internet browsing time at home. Items teachers did not agree with as much as the other items included students not having word problems that reflect unhealthy habits and students having less homework to encourage more time for outdoor activities and sufficient sleep at night.

Recommendations

Clearly there are seemingly simple steps that could be taken to greatly improve the lives of children both in terms of their engagement for learning and their overall health and well being. Combined actions such as improved diet, increased physical activity, and sufficient sleep have

potential for very positive results. However, as simple as these steps appear, it is obvious to anyone who has tried to improve on these variables in his or her own life that this can prove to be quite challenging. Entrenched eating habits can be difficult to change at first, but not insurmountable. Similarly, at first it may be difficult to engage in physical activity on a consistent basis, but once these positive habits are formed they will be easier to sustain. Adults often find it challenging to find enough time to obtain a sufficient amount of sleep, and increasingly this is true for children as well. It is important that children are provided the time they need to get enough sleep at night, which is more important than many of the other activities occupying their time.

Perhaps one of the simplest means of helping children live healthier lives is to reduce the amount of soda they drink, or even more ideally, eliminate soda from the diet altogether. Soda has caffeine and a high quantity of sugar, two stimulants that may precipitate high mental alertness for a brief period of time, but after a short period both caffeine and sugar lead to reduced mental alertness and “crash.” There are nearly 70 grams of sugar in 590 ml of soda. The American Heart Association recommends consuming fewer than 40 grams of sugar per day for adult males and no more than 25 grams per day for adult females (American Heart Association, 2012c), which means one bottle of soda far exceeds the amount of sugar per day that even adults should consume, and even more so for children. Water is the healthiest drink for children and should be their primary source of liquids each day.

Another means of increasing children’s health is an emphasis on legumes for protein, such as beans and lentils, instead of meat products at meals. Legumes are high in protein, but also contain high amounts of fiber, vitamins, and minerals without the saturated fat, cholesterol, carcinogens, and harmful hormones found in meat. A recent study found red meat consumption, even in low quantities, increased the risk of heart disease and cancer mortality later in life (Pan et al., 2012). Other studies demonstrated the benefits of plant-based over animal-based products in the diet (Campbell & Campbell II, 2006; Campbell & Junshi, 1994; Campbell, Parpia, & Chen, 1998; Esselstyn, 2001; Ornish, 1995).

Children should be fed leafy greens every day, such as collard greens or kale, for high vitamin and mineral content. In terms of nutritional value, there are not many better choices than leafy greens for overall daily nutrition. While a multivitamin could be helpful for those not getting sufficient vitamins and minerals from food, obtaining them from food sources is more readily absorbable by the body. Refined products and junk foods provide little to no nutritional value.

Increasing the quality of the food served to children in school cafeterias and greater emphasis on physical education classes would be positive policy steps to improve children’s health. Unfortunately, there is strong resistance to making these improvements. Food manufacturers have recently resisted legislation to improve the quality of food served to children in the schools, according to Margo Wootan, nutrition policy director at the Center for Science in the Public Interest (Baertlein & Abbott, 2011). In 2011 Congress declined to pass a bill that could have reduced the amount of pizza and French fries consumed in schools by increasing the amount of tomato paste required to be considered a serving of vegetables and limiting the amount of starchy vegetables permitted each week. The USDA proposed requiring schools to

increase the variety of vegetables and fruits served, but failure by Congress to act on behalf of children's health demonstrates the strength of the food lobby in Washington to keep unhealthy foods in school cafeterias throughout the United States.

In early 2012 there was a public outcry against serving school children "pink slime," which was the vernacular for lean finely textured beef (LFTB). LFTB is ground beef treated with ammonia to kill E. coli and salmonella in a process used to obtain beef from fat and trimmings (Barclay, 2012), and LFTB is included in school cafeterias due to the inexpensive cost of producing it. Many fast food restaurants have stopped using LFTB, but it is currently considered acceptable for school cafeterias even though schools will now have a choice in whether or not they will serve LFTB in their cafeterias.

Steps for New Alternative Certification Teachers

While there are policy level issues surrounding improving children's health, there are steps new alternative certification teachers can take as they enter the classroom. As seen from the survey results, the alternative certification teachers in the sample were concerned with student health issues. Teachers can take the following practical steps to help improve the health of their students.

First, teachers should be advocates for healthy behaviors by modeling healthy behavior. It is important for students to not see teachers bringing unhealthy lunch choices into the classroom. Additionally, teachers should also avoid bringing junk food into the classroom for students to consume. Instead, teachers can be active advocates for healthy eating and encourage students to participate in physical activities after school, such as playing sports and engaging in other outdoor activities. The sample of alternative certification teachers indicated strong support for teachers teaching healthy behaviors, but was moderately enthusiastic about using their own eating patterns as models for the children.

Second, teachers could eliminate word problems that involve junk food contexts. For example, word problems in mathematics that use junk or fast food as their context could be changed to problems that involve purchasing healthy food from the local market, such as whole grains, legumes, vegetables, and fruits. While there may be objections that having children determine the money needed to buy fast food items entertains their interests since many children enjoy fast food, a similar argument could be made that many teenagers enjoy smoking. However, it would never be considered appropriate to give students a problem that involved purchasing cigarettes. The sample of alternative certification teachers indicated they felt least strongly about eliminating word problems involving unhealthy habits. This may be an area in which new alternative certification teachers need the most support.

Third, unless the new teacher is teaching physical education, it might be assumed there is no place for physical activity in the classroom. Periodically, it is helpful for students to get out of their seats to stretch and move around. Field trips provide great opportunities in getting children to be active. For example, a science teacher may take children to the park to explore science in nature while the children receive the benefit of fresh air and outdoor activity. The sample of alternative certification teachers indicated they felt strongly that physical education should be an

important part of the school day and students should engage in after school sport activities. Helping students to be active during other classes could increase their physical activity as well.

Fourth, teachers could speak with parents to help them make healthier choices for their children regarding the food they eat, amount of physical activity they receive, and the amount of sleep they have each night. While there may be objections that this is not the teachers' but rather the parents' concerns, these variables have a direct impact on the children's education and hence become an important issue for the teachers as well. The sample of alternative certification teachers indicated strongly that parents should establish a "bedtime" each night so that students receive sufficient sleep.

Fifth, it is understandable that new alternative certification teachers working on their initial certifications should be cautious in their approach with administration. However, it is possible to diplomatically address the junk food available in the cafeteria and in the vending machines without being overbearing about it. There may be sympathetic administrators who also wish to see healthier choices provided to the students.

Conclusion

It is important that teachers and their students do not develop discriminatory attitudes toward obese and overweight children. While it is important to strive for healthy lifestyles, it is also important that educators teach acceptance and non-discrimination. Bullying is another important issue in the schools, and obese and overweight children can sometimes be the target of such behavior. Teachers must send a message to students that health and acceptance are important classroom goals. Prejudicial judgment should not be tolerated, and a child's size should have no bearing on how teachers and other children treat that child.

In order to have optimal conditions for learning, students must be adequately nourished, engage in physical activity, and sleep an adequate number of hours each night to be fully rested for school. New alternative certification teachers have an important role in promoting these behaviors. These factors not only affect teaching effectiveness in the classroom, but also have a great impact on the lives of the students, which should be a goal for every teacher. Alternative certification teachers who are new to the classroom will have a greater impact and more pleasant classroom experience if the students they teach adopt healthy lifestyles. As influential people in the students' lives, new teachers can have a tremendous impact on student well being.

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