PHYSICAL ACTIVITY IN YOUTH:
RESEARCH FINDINGS AND EVIDENCED BASED
APPLICATIONS FOR PRACTICE

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Abstract

The high prevalence of obesity in children and adolescents is a serious public health concern. Childhood and adolescent obesity is considered an epidemic in many areas of the world and is on the rise in several others. Overweight and obese is measured by Body Mass Index (BMI). BMI in the 85th to 95th percentile is considered overweight with BMI at the 95th percentile and greater obese. Furthermore, the comorbidities associated with obesity in youth are numerous. This fact is expected to add significantly in the future to the prevalence of chronic diseases associated with adult obesity. The purpose of this paper is to review the current literature addressing childhood and adolescent obesity and its relationship to physical activity, to summarize the findings of current studies, and to provide targeted implications that Advanced Practice Nurses can apply with children and adolescents.
The high prevalence of obesity in children and adolescents is a serious public health concern. Childhood and adolescent obesity is considered an epidemic in many developed countries and is now on the rise in many developing countries around the world. According to the International Obesity Task Force, at least 177 million children and adolescents are overweight or obese worldwide. This number equates to greater than one in ten youth being overweight or obese globally (International Obesity Task Force [IOTF], 2009).

In the United States, results from the 2003-2004 National Health and Nutrition Examination Survey (NHANES), using measured heights and weights, indicate that an estimated 17% of children and adolescents ages 2-19 years are overweight. Furthermore, an additional 16% are obese, equating to 33% of children and adolescents are overweight or obese in the U.S. today (CDCP, 2008c). This represents approximately a 55% increase from the overweight estimates of 11% obtained from NHANES III for 1988-1994 (Centers for Disease Control and Prevention [CDCP], 2006), illustrating a disturbing trend for health in this country.

The correlation between childhood and adolescent obesity and adult obesity is clear. Many overweight children and adolescents become obese adults. The probability that an obese adolescent will become an obese adult is approximately 50% (Whitlock, Williams, Gold, Smith, & Shipman, 2005). Currently, 66% of adults in the U.S. are considered overweight or obese (CDCP, 2008c), further illustrating the need and importance of addressing and treating obesity in youth.

Additionally, numerous comorbidities are associated with childhood and adolescent obesity. The risk factors for cardiovascular disease, hyperinsulinemia, impaired glucose
tolerance, dyslipidemia, and hypertension are seen in overweight and obese children as young as 5 years of age. These risk factors are associated with sustained obesity into adulthood (Flynn et al., 2006). Additionally, an estimated 61% of overweight children and adolescents have at least one additional risk factor for heart disease, such as high cholesterol or high blood pressure. Overweight children and adolescents are more likely than children and adolescents of recommended weight to become overweight or obese adults and they are also at increased risk for associated adult health problems, including heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis (CDCP, 2008b) further illustrating the negative health effects of overweight and obese in youth.

Furthermore, beyond the related health risks and complications associated with obesity, society bears an enormous financial cost. It was estimated that in 2001 obesity accounted for an annual cost of $117 billion in the United States alone. Direct healthcare costs include preventive, diagnostic, and treatment services such as physician visits, medications, hospital, and nursing home care. Indirect costs consist of the value of wages lost by people unable to work because of illness or disability, as well as the value of future earnings lost by premature death. Because the prevalence of overweight and obesity have continued to rise, these costs are even higher today (National Institutes of Health [NIH], 2007).

Overweight and obesity in youth and adults has been established by Healthy People 2010 as one of the top ten major health concerns currently in our nation. Data from the Healthy People 2010 Midcourse Review (United States Department of Health and Human Services [USDHHS], 2007b) showed significant trends for adults, adolescents, and children in actually moving away from instead of moving toward projected targets for body mass index (BMI). During the survey periods from 1988-1994 to 1999-2002, the proportion of adults at a healthy weight decreased
from 42% to 33% while the proportion of adults who were obese increased from 23% to 30%.

The *Healthy People 2010* target for adults was set at 60% for healthy weight and 15% for obesity. For children and adolescents aged 6-19 years, the prevalence of overweight and obesity increased from 11% to 16%, moving away from the set target of 5% (USDHHS, 2007b). Clearly these trends illustrate the need for effective interventions and treatment for overweight and obesity in youth and adults.

Although certain medical disorders can cause obesity, less than 1% of all obesity is caused by physical conditions (American Academy of Child and Adolescent Psychiatry, 2008). Therefore, the etiology of obesity for 99% of individuals is determined by genetic characteristics and influenced by environmental factors (Singh, 2008). Consequently, the over-consumption of calories and reduced physical activity are the two main contributing factors of childhood and adolescent obesity. Therefore prevention is a key factor in control of the current obesity epidemic. It is difficult to reduce excess weight once it has become established, so children and adolescents should be considered the priority populations for weight maintenance intervention strategies. Many intervention strategies, such as environmental design, diet, school services, and physical activity, have all been implemented. There is an undeniable need for treatment interventions that offer weight maintenance and stabilization in children and adolescents (Dehghan, Akhtar-Danesh, & Merchant, 2005). Thus, primary interventions regarding exercise and other physical activity are central as a means to prevent and treat the childhood and adolescent obesity epidemic.

Physical activity declines dramatically with age during adolescence. The Surgeon General’s Report on Physical Activity and Health found nearly half of young people aged 12-21 years are not vigorously active on a regular basis. Moreover, high school enrollment in daily
physical education classes has dropped from 42% in 1991 to 25% in 1995. Only 35% of high school students had participated in at least 60 minutes per day of physical activity on 5 or more of the last 7 days and only 19% of all high school students are physically active for 20 minutes or more 5 days a week in physical education classes (USDHHS, 1999). The United States Department of Human and Health Services recommends that young people between the ages of 6-17 years participate in at least 60 minutes of physical activity daily. Moreover, most of the sixty minutes should consist of either moderate or vigorous intensity aerobic physical activity. As part of their daily physical activity, children and adolescents should do vigorous intensity activity on at least three days per week. Muscle-strengthening and bone-strengthening activity should also occur on at least three days per week (USDHHS, 2008a). These statistics further emphasize the need for structured physical activity for youth.

Statement of Purpose

The purpose of this paper is to review current literature addressing childhood and adolescent obesity and its relationship to physical activity, to summarize findings of the studies, and to provide targeted implications that the Advanced Practice Nurse can apply with children and adolescents.

Theoretical Framework

Nola Pender’s Health Promotion Model can serve as a theoretical framework to guide the Advanced Practice Nurse’s care with children and adolescents, including those at risk for developing overweight and obesity. Healthcare providers are important sources of interpersonal influence that can increase commitment to and engagement in health-promoting behaviors. Furthermore, the opportunities and obligations for Advanced Practice Nurses (APNs) in health promotion continue to grow, and APNs must take a leadership role in incorporating the findings
of research about health promotion into clinical practice. Bringing new research findings to a population where patient teaching can bring about a lifetime commitment to a new health behavior cannot be overlooked (Pender, Murdaugh, & Parsons, 2006).

Definitions and Measurements

Body mass index (BMI) is a statistical measurement which establishes a ratio of height and weight to estimate the percentage of body fat. Due to its ease of measurement and calculation, it is the most widely used diagnostic tool to screen for weight categories that may lead to health problems. BMI is considered to be a reliable indicator of body fatness for most children, teens, and adults and is calculated by dividing the individual’s body weight in kilograms by the square of the height in meters. For adults 20 years and older, BMI is interpreted using standard weight categories that are the same for men and women. Adults are considered overweight if they have a BMI of 25-30, and are considered obese if they have a BMI of 30 or greater. For children and adolescents from the age of 2 to 20 years, the interpretation of BMI is both age and gender specific. After it is calculated, the BMI number is plotted on a BMI-for-age growth chart to obtain a percentile ranking. The percentile ranking indicates the relative position of the child’s BMI number among children of the same sex and age. Values above the 85th percentile are considered overweight, and those above the 95th percentile are obese (CDCP, 2008a).

Literature Review

Methods

A comprehensive review of literature was performed using a broad strategy that included electronic databases and search engines. These included searches in Pub Med, CINAHL, Medline, Cochrane Library, Ovid, Google, and Google Scholar for studies published between
1995 and the present. The key words that were used included “adolescent,” “overweight,” “obesity,” “physical activity,” and “exercise.” The searches were conducted using these words in a variety of combinations. Studies were selected that had specific information regarding the relationship of physical activity to obesity or overweight in youth.

**Relationships Between Physical Activity and Weight**

Several studies have examined the relationship between physical activity and childhood and adolescent obesity and overweight in youth. Sedentary behaviors, particularly hours of television viewing, computer usage, and video games (labeled “screen time”), have been consistently related to overweight in youth (Kohn et al., 2006).

In assessing the level of physical activity between recommended weight, overweight, and obese children and adolescents, many studies have found that there are significant differences in the amount of physical activity in each of these groups. One study with a sample of 364 children and adolescents consisting of males and females in grades 6-8 from 10 different schools, found significant differences in the amount of activity with an inverse correlation between BMI and physical activity (Planinsec & Matejek, 2004).

Epstein, Paluch, Gordy, and Dorn (2000) used a randomized controlled study in 90 families to compare the influence of decreasing sedentary behavior versus increases in physical activity for the treatment of obesity in 8-12 year-old children. Results obtained from 2 years of observation demonstrated that targeting either decreased sedentary behavior or increased physical activity was associated with significant decreases in percent overweight and body fat. Percent overweight decreases of 25.5% at the end of treatment represented a reduction of 41% from baseline, 22.7% at the end of 6 months, and a decrease of 10.9% overweight at 2 years.
In a smaller study, 21 children in grades 4-5 with a body mass index at or above the 85th percentile, participated in a 6 month study to evaluate the effect of an after school soccer program. Sessions initially started at 3 days per week, but then increased to 4 days a week during month 5 at the request of the participants. One day a week consisted of a game day with the other days being practice days. Sessions were approximately 2 hours long starting with a homework period followed by 75 minutes of activity. Results showed statistically significant beneficial effects on the participant’s BMI (Weintraub et al., 2008).

In another study conducted in an effort to measure the association between bicycling and overweight status, a survey was constructed to gather activity practices in a cross-sectional convenience sample of 100 children. The mean age of the population was 11.8 years and 56% of the subjects were overweight when the study was initiated. It was found that the children who rode a bike just once a week or less were the most likely to be overweight. The conclusion was riding a bicycle at least 2 or more days a week is associated with a decreased likelihood of being overweight during childhood (Dudas & Crocetti, 2008).

A decline in the amount of physical activity adolescents participate in has been observed as they age. Pietilainen et al. (2008) observed that physical activity begins to decline in adolescence with a concomitant increase in weight. It was hypothesized that a ‘vicious circle’ may arise between decreasing physical activity and weight gain from adolescence to early adulthood. This study assessed physical activity and self-perceived physical fitness in adolescents at 16-18 years to predict the development of obesity and abdominal obesity in males and females at age 25 years in 4,240 twin individuals. It was found that inactivity in adolescence strongly predicted the risk of obesity and abdominal obesity in the study population when re-evaluated at 25 years. Poor physical fitness in adolescence also increased the risk of overall...
obesity and abdominal obesity in adulthood. Physical inactivity was both causative and secondary to the development of obesity. It was concluded that physical activity in adolescence strongly and independently predicts total and especially abdominal obesity in young adulthood. This seemed to favor the development of a self-perpetuating circle of obesity and physical activity leading to the author recommendation that physical inactivity should be a focus of obesity prevention in the young.

Other studies have focused on the effects of increasing physical activity in adolescents. In a study completed in the school setting, Sadowsky, Sawdon, Scheiner, and Sticklin (1999), found that 8 weeks of exercise at a set level of intensity was sufficient to elicit statistically significant body composition changes in adolescents with only one instructional session. Seventy-one adolescents (50 females and 21 males) between the ages of 15-18 years were included in this study. The intervention group exercised for 40 minutes, 4 times a week for 8 weeks, while a control group participated in their regularly scheduled physical education classes. Each subject's body composition was assessed at baseline and after 8 weeks. A 2% decrease in body fat and a decrease in BMI were found in the intervention group of youth at the conclusion of the study.

Farias et al. (2009) conducted a study which focused on the influence of a programmed physical activity during one school year. The sample included 383 students between the ages of 10-15 years. There were 186 subjects (96 male and 90 female) in the intervention group, and 197 controls (108 male and 89 female). Pre-test and post-test assessments were used. Body composition was assessed by anthropometric measurements, BMI, body fat percentage, and fat and lean body mass. The intervention consisted of a programmed physical activity and the control group had conventional school physical education. At post-test, overweight and obesity significantly decreased among case group subjects, but not among the control group. The
programmed physical activity resulted in improvement or maintenance of body composition parameters and reduction of overweight and obesity in the intervention group.

Schwingshandl, Sudi, Eibl, Wallner, and Borkenstein (1999) examined the effect of a standardized training program focusing on maintenance of fat free mass during weight reduction in obese children. Although dietary advice was reviewed in this study as well, 30 obese children and adolescents participated in a 12 week long training program with 20 participants being assessed at the one year mark. Fat free mass was measured after 4, 8, and 12 weeks in all subjects, and after one year in 20 subjects. The mean change in fat mass was significantly different between the two groups after 12 weeks, and the change in body weight after one year was inversely correlated with the change in fat free mass after 12 weeks.

Other research studies have also demonstrated that a decrease in fitness is inversely correlated with BMI. Aires et al. (2008) completed a cross-sectional study that focused on the physical fitness levels in a school population of 11-18 year old students. An analysis of the differences of BMI in overweight was used. The sample contained 636 children and adolescents, (288 boys, and 347 girls). Six tests from a FitnessGram (standardized health related fitness assessment tests [Human Kinetics, 2009]) battery were used as an objective measure of physical fitness. Both girls and boys with obesity performed a significantly number of reduced tests in the healthy fitness zone suggesting a decrease in performance in strength and cardiovascular fitness, as compared with children of recommended weight. This study demonstrated that low BMI could significantly improve some physical fitness components.

The purpose of a study completed by Mojica, Poveda, Pinilla, and Lobelo (2008) was to determine the prevalence of overweight and obesity and its association with physical activity and fitness among boys attending a private school in South America. The study consisted of 655 boys
from 7 to 18 years. A questionnaire using self-reported physical activity habits was utilized as well as physical fitness assessment. The associations between weight status and physical activity and fitness were assessed by logistic regression models. Results demonstrated was that 38% of the boys who were overweight as assessed by BMI, scored poorly on the FitnessGram. A relationship was also found between overweight and poor performance in the aerobic fitness test portion of testing. Overweight was not associated with TV watching time, video games or use of Internet in this study, but there was a significant relationship between poor physical fitness, low levels of physical activity, and overweight.

Other studies have examined the relationship between increased physical activity in adolescents and adult weight status. A cohort study that examined this relationship was based on data from the National Longitudinal Study of Adolescent Health. A total of 3,345 adolescents from grades 8 to 12 were studied; BMI data were available at baseline and five years later. Days per week of curricular and extracurricular physical activity were measured. This study concluded that increasing participation in certain extracurricular physical activities and physical education decreased the likelihood of young adulthood overweight. Regarding extracurricular physical activities, the likelihood of being an overweight adult was reduced by 48% through performing certain wheel-related activities, rollerblading, roller skating, skateboarding, or bicycling, more than four times per week. Each weekday that adolescents participated in physical education decreased the odds of being an overweight adult by 5% percent, with participation at 5 weekdays of physical education decreasing the odds by 28%. In general, physical activity predicted normal-weight maintenance better than weight loss. The data collected underscores the important role that school-based and extracurricular physical activity play in reducing the likelihood of transitioning to overweight as young adults (Menschik, Ahmed, Alexander, & Blum, 2008).
A study was conducted by Yang, Viikari, and Raitakari (2006) to determine how maintaining a high level of physical activity throughout one’s lifespan may decrease the risk of obesity. Physical activity patterns of youths from 9-18 years were followed longitudinally into adulthood and the association with BMI and waist circumference was examined. This study assessed physical activity over a 21 year follow-up in 1319 subjects. Physical activity was measured using a questionnaire completed in conjunction with a medical examination. The results reported on follow-up that 33.1% of men and 32.0% of women were classified as persistently active, with 11.5% of men and 7.4% of women as persistently inactive. Both the decreasingly active and persistently inactive subjects were more likely to be obese as adults. The results showed that maintaining a high level of physical activity from youth to adulthood is independently associated with lower risk of abdominal obesity among women, but not men. These findings suggest that changes in physical activity patterns during the lifetime may contribute to the development of abdominal obesity in women.

Few studies have demonstrated no correlation between increased physical activity and decreased BMI or fat free mass in adolescents. Metcalf, Voss, Hosking, Jeffery, and Wilkin (2008) studied the extent to which physical activity at the government recommended intensity of 60 minutes at three metabolic equivalents of thermogenesis (MET) per day affected BMI (MET is a physiological unit used for expressing the intensity and energy expenditure of physical activities in a way comparable among persons of different weight [USDHHS, 2008b]). A non-intervention longitudinal study of 113 boys and 99 girls born in 1995 and 1996 were recruited from 54 schools. Physical activity, changes in body mass, fatness determined by skin-fold thickness and waist circumference, metabolic status measured by insulin resistance, triglycerides, cholesterol/HDL ratio and blood pressure, were measured on four annual occasions, at 5, 6, 7,
and 8 years. Mean physical activity did not change over time in either sex. There were no associations between physical activity and changes in any measurement of body mass or fatness over time in either sex. However, there was a small to moderate inverse association between physical activity and change in composite metabolic score. Mixed effects modeling showed that the improvement in metabolic score among the more active compared to the less active children was linear with time. In conclusion, physical activity above the government-recommended intensity of 60 minutes at three MET is associated with a progressive improvement in metabolic health but not with a change in BMI or fatness. Girls habitually undertook less physical activity than boys, questioning whether girls in particular should be encouraged to do more, or the recommendations adjusted for girls.

Hagstromer, Elmberg, Marild, and Sjostrom (2008) conducted a study to evaluate the impact of organized weekly exercise for 13 weeks on aerobic fitness, objectively assessed habitual physical activity, and body weight in obese adolescents. After a diagnostic evaluation, the subjects, ages 10-18 years, were randomized to either an exercise group or to a control group which lasted for 13 weeks and consisted of a variety of group exercise activities. This study had a somewhat small sample, with 16 students in the exercise group and 15 students in the control group. After the intervention, the exercise group had decreased the daily time spent in moderate activity by 17 minutes per day with an increased tendency for time spent in inactivity by 37 minutes per day. The conclusion of this study was that the exercise group showed, in contrast to expectations, a reduction in total daily physical activity.

Meta-analysis studies of the existing literature have generally supported the correlation of physical activity with decreased BMI in adolescents. A meta-analysis conducted by Maziekas, LeMura, Stoddard, Kaercher, and Martucci (2003) included eight studies containing 236 subjects
between the ages of 4-17 years of age enrolled in exercise interventions that included walking, jogging, cycle aerometry, and high-repetition resistance exercise lasting 8 weeks or more. Follow-up was completed at one year with pre-test and post-test values for efficacy. In all eight studies, across all designs and categories, significant decreases in percentage of body fat were seen in all study groups. Statistical differences were seen immediately following the study, and also at the one year follow-up. Forward stepwise linear regression suggested physical activity accounted for a 53-86% variance for percentage of body fat at one year.

LeMura and Maziekas (2002) performed a meta-analysis of 30 studies with 945 youth 5-17 years by exploring changes in BMI, fat-free mass, and percentage of body fat in obese children and adolescents. Pre-test and post-test values were used. Post-test results demonstrated across all designs and categories, percent of body fat was decreased, BMI was decreased and fat free mass was increased. Stepwise linear regression suggested that initial body fat levels, type of treatment intervention, exercise intensity, and exercise mode accounted for most of the variance associated with changes in body composition after training.

In another meta-analysis of the literature, studies with 50 or more adolescents using observational, experimental, and quasi-experimental studies were identified. Physical activity estimated from questionnaires and BMI were the most frequently used measures. The majority of the reviewed studies demonstrated a protective effect of physical activity on adiposity, especially for the individuals who were obese at baseline. These reviewers cited that lack of validity in the measurements of physical activity and body composition need to be addressed to generate evidence-based recommendations for the quantity and quality of adolescent physical activity required to prevent or treat adolescent obesity (Reichert, Baptisita Menezes, Wells, Carvalho Dumith, & Hallal, 2009).
One meta-analysis that did not find a positive correlation between physical activity and BMI was a systemic review to determine the effect of school-based physical activity interventions on BMI. Eighteen studies involving 18,141 primarily elementary school children met the reviewer’s criteria. The study durations were from 6 months to 3 years. Meta-analysis showed that BMI did not improve with physical activity interventions and no consistent changes in body composition were demonstrated. In conclusion, this study found that school-based interventions did not improve BMI and current population-based policies that mandate increased physical activity in schools are unlikely to have a significant effect on the increasing prevalence of childhood obesity (Harris, Kuramoto, Schulzer, & Retallack 2009).

In conclusion, this review strongly reinforces the fact that daily moderate to vigorous physical activity is related to a reduction in adiposity in youth. Although few studies have not found a correlation between increased physical activity and decreased BMI, a majority of the current literature does support the relationship between increased physical activity and a reduced BMI (Davis et al., 2007).

**Implications for Evaluation and Practice**

The need for the Advanced Practice Nurse to utilize evidence-based treatment recommendations and treatment for at risk and overweight and obese youth is a critical healthcare concern. Adolescents are at risk to develop the same comorbidities seen in obese adults so the most pressing need are interventions that increase activity. Theoretically supporting this objective is the Health Promotion Model proposed by Nola J. Pender. The Health Promotion Model purposes that health is a positive dynamic state and not merely the absence of disease. Health promoting behaviors should result in improved health, increased functional ability, and better quality of life at all stages of development (Pender, Murdaugh, & Parsons, 2006). The
Physical Activity guidelines developed by the American Academy of Pediatrics (AAP, 2007) for prevention and treatment of pediatric overweight and obesity parallel these beliefs. These guidelines serve to direct Advanced Practice Nurses and other healthcare providers with the latest clinical information to effectively address obesity prevention, assessment, and treatment.

Targeting healthcare providers and parents alike, the AAP (2007) recommends that all children and adolescents have a thorough history completed including family history, eating, and physical activity at the yearly childhood assessment. Assessment of behaviors should include evaluation of screen time, sweetened beverages, eating out, fruits and vegetables intake, along with the amount and type of physical activity engaged in. The practitioner is advised to consider the patient’s risk for overweight and obesity relative to family history, height and weight gain pattern, socioeconomic, ethnic, cultural, presence of comorbidities, and environmental factors. BMI should also be calculated and plotted annually for all youth beginning at the age of 2 years. It is important to use decrease in BMI to identify rate of excessive weight gain linear to growth.

Prevention and treatment guidelines are divided into five levels of care by the AAP (2007). The first level is prevention. Prevention should include all patients with promotion and support for breastfeeding, family meals, limited screen time, regular physical activity and annual BMI monitoring.

The second level of care is called prevention plus. It is intended for overweight children between the 85th - 94th percentiles of BMI. Healthcare providers should encourage five servings of fruits and vegetables each day, 2 hours or less of screen time, 1 hour or more of physical activity and no sugared drinks for all patients in this group. Also, the importance of family meal time, limiting eating out, consuming a healthy breakfast, preparing your own foods, and promotion of breastfeeding should be discussed.
The third level of care is structured weight management and is applied if prevention plus has not been effective and BMI is between 95th - 98th percentiles. This approach combines more frequent follow-up with written diet and exercise plans.

Level four is a comprehensive multidisciplinary intervention. This is used when 3-6 months of structured weight management has failed to achieve targets. This approach combines more frequent visits with the provider and a dietician and could also include exercise and behavioral specialists.

Lastly, level five involves the tertiary care intervention. It is designed for youth with a BMI in 99th percentile or greater with associated comorbidities or for those with whom the structured weight management and comprehensive multidisciplinary interventions were not effective. These newly revised guidelines consist of all that is contained in the previous AAP interventions plus the consideration of more aggressive therapies such as meal replacements, pharmacotherapy, and even bariatric surgery in selected adolescents (AAP, 2007).

Discussion

Former U.S. Surgeon General Richard Carmona MD, described obesity as “the greatest threat to public health today. It kills more Americans every year than AIDS, all cancers and all accidents combined. And it's causing problems in children that were unthinkable 20 years ago” (Office of the Surgeon General, 2003). This astounding fact further reinforces the need for obesity prevention and treatment in children and adolescents. Furthermore, beyond the health risks of obesity in youth, for many obese children and adolescents, the most widespread consequence is not medical, but psychosocial. Children and adolescents are socialized to the importance of appearance early in life. When perceived to be different from recognized norms and their peers, both boys and girls report dissatisfaction with themselves with excess weight
being a common reason. Moreover, obese children and adolescents often experience significant depression with low self-esteem (Jonides, Buschbacher, & Barlow, 2002) further underscoring the need for prevention and treatment for obesity in this population. This social and personal stigmatism can further lead to behaviors contributing to additional weight gain with further reduction in physical activities.

Specifically targeting the care APNs provide to at risk and overweight and obese youths, Larsen, Mandleco, Williams, and Tiedeman (2006) conducted a study to examine the prevention practices of APN’s regarding childhood and adolescent obesity. The practices of APNs were compared by specialty, practice setting, and awareness of childhood obesity prevention guidelines. Also, the relationships between prevention practices and demographic variables along with the resources for barriers to implementing prevention practices were examined. A convenience sample of 99 Family APNs and Pediatric APNs was used. The study participants completed a questionnaire based on the documented risk factors for childhood and adolescent obesity as well as the prevention guidelines developed by the AAP (2007). The conclusion of the study was that the majority of APNs in family and pediatric practices were not consistently using the BMI-for-age-index guidelines developed by the AAP to screen for obesity in youth. They were however, teaching parents to promote healthy food choices and physical activity in their families. APNs who were aware of the AAP prevention and treatment guidelines were more likely to perform prevention and treatment strategies. This demonstrates the importance of APNs learning and practicing the guidelines developed by the AAP. The “15 Minute Obesity Prevention Protocol” is a tool developed by Davis et al. (2007) for providers to use in practice to assist in the prevention of overweight and obesity in youth (see Appendix).
In conclusion, childhood and adolescent obesity has a complex development, involving environmental, physiologic, and genetic factors. The basic cause of this condition is an imbalance between energy intake and energy expenditure. Physical activity is the only modifiable element of the energy expenditure portion of the energy balance equation. Consequently, increasing physical activity has the potential to improve weight loss and maintenance throughout life. Strategies to increase physical activity should include increases in structured and non-structured physical activity with reductions in the amount of time spent in sedentary activities (Spear et al., 2007). Furthermore, the benefits of physical activity for children and adolescents are many. Physiological benefits include decreased body fat, reduced blood pressure in mildly hypertensive youth, and improvements in cardiovascular fitness and skeletal health. Physical activity has also been found to improve mental health and academic performance (USDHHS, 2007a). Overwhelmingly, most studies indicate that an increase in sedentary activities and an overall decrease in physical activity are contributing to an increased incidence of overweight and obesity in children and adolescents (Spear et al.). Therefore it is imperative to promote and encourage moderate to vigorous physical activity in all children and adolescents for at least 60 minutes each day. Furthermore, it is essential that all Advanced Practice Nurses and healthcare providers offer weight management strategies and interventions for all youth and parents in an attempt to decrease the epidemic of obesity in youth.
References


Appendix

15-MINUTE OBESITY PREVENTION PROTOCOL

Step 1: Assess

- **Weight/Height:** Explain what you are assessing and why. Convert weight and height data to BMI (Body Mass Index) percentile. Provide BMI percentile. Elicit and probe parent/child reactions.

- **Diet:** Assess intake of fruit and vegetables (suggested measure: 2 items on daily usual intake; measure can be provided in handout), sweetened beverages (suggested measure: 2 items on daily usual intake; measure can be provided in handout), and fast food (suggested measure: 1 item on weekly average of meals at fast food establishments).

- **Activity:** Assess sedentary time/screen time (suggested measure: 2 items on hours per day of television/video games/movies/computer; measure can be provided in handout) and daily activity (at least 60 minutes/day of moderate-to-vigorous activity).

- **Optional Behaviors to Assess:** Consider assessing breakfast consumption (suggested measure not established), portion sizes (suggested measure not established), and family meals (suggested measure not established).

- **Provide/Elicit:** Provide positive feedback for behavior(s) in optimal range. Elicit and probe parent/child response. Provide behavior(s) not in optimal range. Elicit and probe parent/child response.

Step 2: Set Agenda

- Query which, if any, of the target behaviors not in the optimal range the parent/child/adolescent may be interested in changing or may be easiest to change. Sample language is as follows. Which, if any, of these might you and your child be able to change? Which of these might be a good place to start? Which of these do you think might be the easiest one to start with? Agree on possible target behaviors.

Step 3: Assess Motivation and Confidence

- **Willingness/Importance:** Assess willingness and importance, as follows. On a scale of 0 to 10, with 10 being very important, how important is it for you/child/family to change (insert target behavior) or to lose weight?

- **Confidence:** Assess confidence, as follows. On a scale of 0 to 10, with 10 being very confident, assuming you decided to change (insert target behavior) or weight, how confident are you that you/she/he could succeed?
• **Probes:** Explore importance and confidence ratings with the following probes. Why did you not choose a lower number (benefits)? Why did you not choose a higher number (barriers)? What would it take to move you to a higher number (solutions)? Use reflective statements to explore the advantages and disadvantages of changing.

**Step 4: Summarize and Probe Possible Changes**

• Summarize the advantages and disadvantages of change. Query possible next steps. Sample language is as follows. So where does that leave you? From what you mentioned, it sounds like (insert target step) may be a good first step. How are you feeling about making a change? If change is indicated, probe the plan of attack. Sample language is as follows. What might be a good first step for you and your child? What might you do in the next week or even day to help move things along? What ideas do you have for making this happen? From our discussion, it sounds like (insert possible suggestions raised in session) might be a good place to start. If the patient has trouble generating ideas, consider offering the following: If it’s okay with you, I’d like to suggest a few things that have worked for some of my patients. Summarize the change plan. Provide positive feedback.

**Step 5: Schedule Follow-up Visit**

• If a change plan emerges, agree to follow up within $x$ weeks/months. Sample language is as follows. Let’s schedule a visit in the next few weeks/months to see how things went. If no change plan emerges, agree to revisit the topic within $x$ weeks/months. Sample language is as follows. Sounds like you aren’t quite ready to commit to making any changes now. How about we follow up with you at your next visit? Although you (or your family) do not sound ready to make any changes, between now and our next visit you might want to think about (insert discussion point raised in session).