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The Weight of a Healthy Home: Early Screening for Childhood Obesity Risk

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## Abstract

### **Purpose**

Despite the Healthy People 2020 target of 14.5%, the California obesity prevalence among low-income children ages 2 to 19 was 21% in 2010. An obesogenic home environment is a major contributor to overeating and sedentariness during this phase of development as children have less autonomy and are influenced by family environmental cues. The purpose of this evidence-based project was to implement a screening tool at a low socioeconomic elementary school clinic to identify children at risk of developing obesity and provide standardization for practitioners on educating parents regarding child obesity risk factors. The Family Nutrition and Physical Activity (FNPA) screening tool was completed by parents at all visits of school aged children 4 to 11 years old. The nurse practitioner (NP) provided parents with education regarding healthy home practices based on American Academy of Pediatrics (AAP) recommendations.

### **Conclusion**

Instituting the practice change helped to identify children at risk of becoming overweight or obese, and allowed for anticipatory guidance by the NP to increase awareness of parental influence as role models for healthy lifestyle behaviors. Parents who receive education on healthy home environmental strategies showed improvement in modifying home behaviors to reflect recommendations by the AAP.

### **Practice Implications**

Implementation of the FNPA tool at a school based clinic is a feasible opportunity to identify children at risk for obesity. Continuing to educate parents about home risk factors is key in the primary and secondary prevention efforts against obesity.

*Keywords:* childhood obesity, screening tool, family environment, elementary school

### The Weight of a Healthy Home: Early Screening for Childhood Obesity Risk

Childhood obesity is a major public health concern. Obesity during childhood is associated with greater risk of cardiovascular disease, hypertension, hyperlipidemia, type II diabetes, sleep apnea, social discrimination, and is linked to an increased likelihood of obesity in adulthood (Community Health Statistics Unit, 2012). According to the National Center for Health Statistics (2015), the prevalence of obesity among youth in the United States has remained an average of 12.5 million between the years 2011 to 2014. By adolescence, 77% to 92% will have obesity that persists into adulthood, leading to staggering future healthcare costs (Finkelstein, Chen, Graham, & Malhotra, 2014).

In response to the childhood obesity epidemic, research has been conducted addressing the environmental factors placing a child at risk of becoming overweight. The ‘obesogenic’ home environment has been implicated as a major contributing element, as it correlates with both overeating and sedentariness in this age group (Ihmels, Eisenmann, & Myers, 2009). During this phase of development, children are found to have less autonomy in their dietary decisions as their eating habits are directly influenced by their family environmental cues (Horst et al., 2007). Parents play a vital role in influencing both the nutritional and physical activity behaviors among children and are in a unique position to dictate the child’s environment that could predispose them to becoming overweight or obese (Ihmels et al., 2009). Despite best efforts, many parents may be unaware of the strong association their own physical activity level and screen time has on their child’s behaviors, and thus, may be unknowingly creating obesogenic environments (Xu, Wen, & Rissel, 2015).

Based on recommendations from the American Academy of Pediatrics (AAP) Expert Committee, addressing this public health concern places primary prevention at the forefront, as

early detection and intervention are more effective at earlier ages (Daniels & Hassink, 2015).

The AAP develops recommendations for practitioners and families on key constructs including screen time, physical activity, sleep duration, eating habits and rules, and consumption of energy dense foods (Daniels & Hassink, 2015). Evidence has shown that clinicians who are educated about care guidelines for overweight children were more likely to report using sources such as AAP News and other journals for latest evidence on the prevention and counseling for children who are overweight (Klein et al., 2010). Furthermore, Bailey-Davis, Peyer, Fang, Kim, and Welk (2017) found that parents who received this education on home environmental strategies were more likely to engage in modifying childhood obesity risk factors.

Ihmels et al. (2009) developed the Family Nutrition and Physical Activity tool designed to screen for family environmental factors that place a child at risk of becoming overweight. Studies have examined the usefulness of different tools screening the obesogenic home environment and found the FNPA tool to have high validity in screening for childhood obesity risk (Pinard et al., 2011). Tucker et al. (2016) identified the applicability of the FNPA tool for preventing and treating obesity, by not only detecting obesity risk factors in normal weight children, but acting as a guide for practitioners to initiate treatments with those currently overweight or obese. Furthermore, the FNPA tool has shown proven utility in screening for childhood obesity risk and its association with body fat percentage and acanthosis nigricans in low socioeconomic, racially diverse children (Yee et al., 2015).

Despite evidence that has shown that using a screening tool identifying key contributors to childhood obesity risk is important as BMI alone does not measure for these risk behaviors, screening for modifiable family factors is not routinely done (Ihmels et al., 2009; James, Matsangas, & Connelly, 2013). Because one of seven low income preschoolers in San Diego are

found to be obese, a school-based community clinic is uniquely positioned to evaluate the home environments and behaviors of its students early before the child is considered at risk

(Community Health Statistics Unit, 2012). The purpose of this project was to implement the FNPA screening tool with the parents at a low socioeconomic elementary school clinic to screen for obesity inducing home behaviors to identify children at risk for becoming overweight and provide suggestions for healthy practices based on recommendations from the AAP.

Implementation of the FNPA screening tool will help in providing parental awareness on their significance as role models for healthy lifestyles, as well as an opportunity for the clinic NP to provide anticipatory guidance for children identified at risk of becoming overweight.

### **Evidence-Based Practice Model**

The Ottawa Model of Research Use is a knowledge translation model used as a guide to place research into practice in order to effect change across multiple organizations, with proven applicability particularly in school settings, thus, guided implementation of the FNPA tool into a school-based community clinic. Additionally, the model helped in identifying external factors that may have affected the implementation process, a key component as there were many confounding elements including parental concerns, participation, and resistance.

### **Methods**

#### **Practice Setting**

The practice is a full-service school based community health center located in San Diego, CA. The practice is open 19 hours a week, providing service to children birth to 18 years of age. The majority of the clinic patients are at or below the poverty level, with 97% of students at the elementary school eligible for free or reduced-price lunch. The population is approximately 80%

Hispanic. The providers include one advanced registered nurse practitioner (APRN) and two medical assistants (MA).

### **Interventions**

The FNPA screening tool was implemented over a 10-week period as a part of the routine intake for all patients ages 4 to 11. Parents completed the 20 item-screening tool related to 10 factors (family meal patterns, family eating habits, food choices, beverage choices, restriction/reward, screen time behavior and monitoring, healthy environment, family activity involvement, child activity involvement, family routine). Each item is based on a four-point scale. Once the tool was completed, the MA added the scores for the 20 items to determine if the child was at risk of becoming overweight. Total FNPA scores ranged from 20 to 80, with a more obesogenic environment represented by a lower FNPA score and a less obesogenic environment as a higher FNPA score (Ihmels et al., 2009). Overweight risk categories were determined from tertiles established in a study implementing the tool in a similar low socioeconomic urban community who categorized the total FNPA score based on risk for obesity (Yee et al., 2015). For this study, high risk for obesity was a FNPA score of 53 or less, moderate risk was a score of 54 to 66, and low risk for obesity was a score of 67 or greater.

Because body mass index (BMI) is recommended by the AAP and IOM for all routine visits of children, the MA collected anthropometric data for height and weight, as well as plotting the data on the Centers for Disease Control and Prevention (CDC) growth charts (Daniels & Hassink, 2015; Institute of Medicine, 2011). For children, overweight is defined as those in the 85<sup>th</sup> to 94<sup>th</sup> BMI percentile and obese is defined as the 95<sup>th</sup> BMI percentile or greater (Daniels & Hassink, 2015).

According to the Institute of Medicine (2011), as a part of the Early Childhood Obesity Prevention Policies, healthcare visits should provide parents with guidance on physical activity, healthy eating, screen time, and age-appropriate sleep. Thus, concluding the visit, the NP provided all parents with education based on a one page summary sheet of recommended practices per the AAP and the American Dietetic Association that accompanies the FNPA tool. Those with lower FNPA scores (moderate to high risk) were then scheduled for a two-month follow up visit. The family was rescreened with the FNPA tool at the second visit and comparisons were made to the previous FNPA score noting any change in the home behaviors, as well as any change in BMI percentile.

### **Analysis**

The percentage of students identified at risk for overweight or obesity based on FNPA score were calculated. Aforementioned, FNPA score cut off points (low, moderate, and high-risk scores) were used based on tertiles from a previous study with a similar population. Mean change in FNPA score from initial screen and two month follow up were determined to evaluate whether families reported modifying at risk home behaviors. Impact of FNPA score and BMI percentile category on parent's willingness to engage in treatment were analyzed based on the number of families that followed up from each category. BMI percentiles were examined to denote the percentage of students in overweight and obese categories at initial screen and follow up. A 10-item factor analysis was conducted to determine each factors gap from ideal score on initial screen.

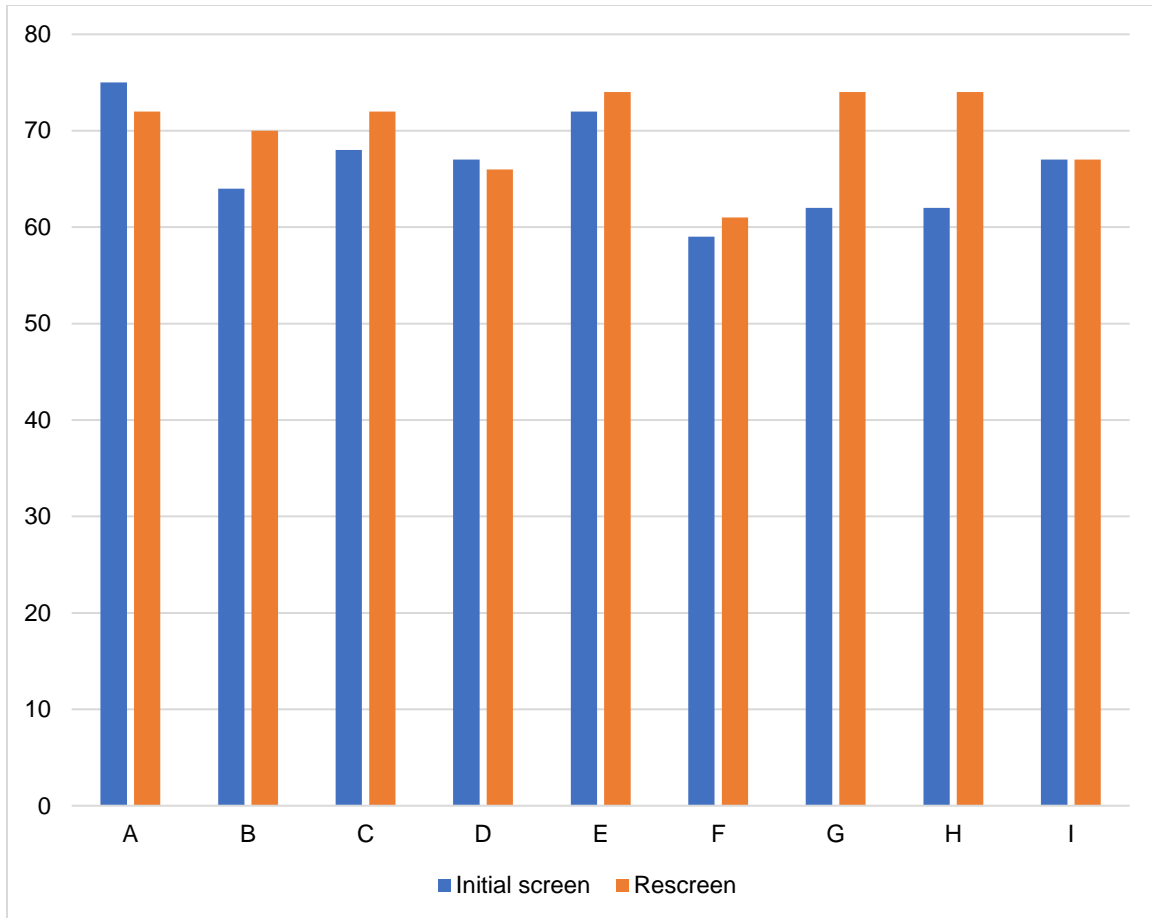
### **Ethical Considerations**

The study obtained approval from the institution and exemption from the university institutional review board prior to implementation.



## Results

A total of 27 children were screened using the FNPA tool. Ninety-three percent of the children were classified as at risk for obesity (BMI percentile 85<sup>th</sup> or greater and/or moderate-high risk FNPA scores). At initial screening, 63% of the children had BMI percentiles at or above the 85<sup>th</sup> percentile (overweight or obese) and 59% had moderate or high risk FNPA scores. Seven percent had a healthy BMI and low risk FNPA scores and did not require follow up intervention. Thirty-six percent of patients were rescreened with the FNPA tool and 64% were lost to follow up. Of the 9 patients who attended follow up, 4 had a high BMI percentile alone, 3 were normal weight with moderate or high risk FNPA scores, and 2 patients had both high BMI percentiles and FNPA score. The average improvement of FNPA score between initial screening and follow up was 3.78 points (see Figure 1).



*Figure 1.* FNPA scores at initial screen and two month follow up. This figure illustrates scores of patients identified as at risk for obesity who returned for follow up.

Six patients scores improved, with a mean change of 6.3 points (range 2 to 12 points). Two patients scores worsened and one patient's score remain unchanged. The top 3 factors that accounted for 41.3% of gap from ideal score on initial screen (in order of significance) were child activity, screen time behavior, and beverage choice.

### Discussion

The FNPA screening tool practice intervention was designed to detect adverse obesogenic home environmental practices as a preventative measure against childhood obesity.

Yee et al. (2015) had established the FNPA tools usefulness in a low socioeconomic community, primarily Caucasian and African American. This study expanded the tools utility to include a population that was predominantly Hispanic and of similar economic stature. With improvement in FNPA score from initial screen to follow up, it is evident that screening not only helped to identify children at risk of becoming overweight, but also improved health outcomes as it provided educational recommendations for the parents on the basis of current research on maintaining healthy home environments (Ihmels et al., 2009).

An important strategy in reducing the prevalence of obesity in adults and the wide range of its associated co-morbid diseases is childhood obesity prevention (Finkelstein et al., 2014). The US Task Force on Childhood obesity goal is to reduce childhood obesity prevalence to 5% by 2030 (Finkelstein, Chen, Graham, & Malhotra, 2014). Recommendations have shifted away from identifying obesity when the condition is apparent, to assessment that is universal and geared towards early prevention (Barlow, 2007). The FNPA tool identified approximately 30% of healthy weight children as having obesity provoking home environments, a population that may have been missed if BMI percentile alone was accounted for.

It is estimated that the lifetime incremental medical cost of one obese child compared to a child of healthy weight is \$19,000 (Finkelstein et al., 2014). California has the highest medical costs related to obesity, roughly \$15.2 billion, of which 41.5% is financed through Medicare and Medi-Cal (California Department of Public Health, 2014). For the six patients with improvement in FNPA score, there is a potential cost savings of \$114,000. Three hundred forty-two thousand dollars in medical costs are expected for the 18 patients who were lost to follow up. Furthermore, according to Live Well San Diego (2015), these overweight and obese children are more likely to be absent from school than their healthier counterparts. Between 2009 and 2010, San Diego

County public schools lost out on more than \$102 million in state funding due to its absences. The average annual loss of state funding per one student absentee in San Diego County is \$211.20 (Office of Attorney General, California Department of Justice, 2013).

Christison et al. (2014) utilized the FNPA screening tool and motivational interviewing during well-child visits as a counseling tool for providers. The more overweight and obese subjects had better follow up at 1-month follow up surveys, however, this was not evident at 6 months (Christison et al., 2014). In this study, level of risk (high risk FNPA score and/or BMI percentile greater or equal to 85) did not appear to affect parent willingness to engage the child in treatment. Being already overweight/obese vs having a high risk FNPA score were almost equal in responsiveness, 4 vs 3 patients followed up, respectively.

Barlow (2007) describes the role of the stages of change theory in counseling families, where provider education will only be effective when the family recognizes and wants to address a potential or actual problem. Shloim, Edelson, Martin, and Hetherington (2015), described that African American and Hispanic families tend to have indulgent feeding styles, linked with less satiety with meals and subsequently higher BMI percentiles. Understanding what the families in this study believe is a healthy weight and what foods are culturally appropriate to provide children is important when a provider is counseling on obesity prevention. Thus, tailoring recommendations specific to the families ethnic group and economic status, along with the families' personal values, is key in ensuring increased quality of care and facilitating parent awareness as models for healthy lifestyle behaviors (Barlow, 2007).

### **Limitations**

This practice intervention is not without limitations. A small sample size may overestimate the FNPA tools impact on evaluating improvements in familial environment. A

short follow up period for patients identified as at risk for becoming overweight or obese based on total FNPA scores did not allow for longitudinal assessment of BMI percentile change. Of the patients in the EBP project, a large percentage were lost to follow up. The majority of the patient population was comprised of low socioeconomic families. The patient demographics may have been a confounding factor, due to the known barriers to healthcare this population endures. Other reasons included patients transferring to other clinics and an inability to contact the family by phone and mail.

### **Conclusion**

A practice-based intervention utilizing the FNPA screening tool proved to address the need for obesogenic environmental screening in a school clinic setting to better identify those children at risk for obesity. Increasing the number of students whose parents complete the FNPA screening tool at the clinic sets the stage as an opportunity to increase parental awareness regarding family choices and their accompanied risks. Including motivational interviewing as an additional intervention, similar to the study by Christison et al. (2014), may aid in understanding the family's readiness to make lifestyle changes and in turn impact their engagement in follow up and the sustainability of the practice change. A future intervention that may assist in evaluating the tools efficacy in addressing obesogenic behaviors and its impact on weight trajectories will require a larger sample and lengthier follow up. Longitudinal data collection and evaluation may represent the screening tools impact on BMI percentile over time.

### **How might this information affect nursing practice?**

The complexity of chronic conditions like childhood obesity can overwhelm both the patient and the provider, as these visits require care centered on patient education and family willingness to engage in self-management. By altering obesity assessment to include universal

screening and education to all families, early anticipatory guidance by the nurse practitioner or clinician may mitigate the risks of obesity development. For children in the healthy weight categories whose obesogenic home environments place them at greater risk for developing obesity, utilizing the FNPA tool to establish healthy home behaviors acts as a primary prevention effort. However, in order to effect change, involvement of the community such as school wellness committees must be done for continued assessment, monitoring, and family support. Thus, the role of nursing as educators in utilizing this practice change in a school-based clinic setting is paramount in fighting the childhood obesity epidemic.

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