Motivational interview techniques combined with an evidence-based guideline provide valuable tools for the treatment of childhood obesity. The National Association of Pediatric Nurse Practitioners’ Healthy Eating and Activity Together guidelines were adopted in a rural pediatric office. After a 6-month pilot, effectiveness of treatment was evaluated with a retrospective chart review. The results suggest that children were motivated for healthy lifestyle changes but had difficulty maintaining motivation and compliance with healthy change choices after 1–2 months; however, with consistent use of motivational interviewing techniques combined with diet and exercise counseling, there was a trend toward lowered body mass index and waist measurements.

© 2011 Elsevier Inc. All rights reserved.

THE DRAMATIC INCREASE of obesity rates in the United States over the past 20 years is having an adverse affect on the health of the pediatric population. Issues for overweight or obese children include low self-esteem, social isolation, and lower quality of life (Whitlock, 2003). Chronic diseases such as hypertension, insulin resistance, dyslipidemia, metabolic syndrome, and Type II diabetes have increased in children (Washington, 2008). Compounding the comorbidity is the fact that an overweight school-age child has a 30% chance of becoming an obese adult, and this chance increases to 80% for an adolescent (Rodin, Alexander, Guillory & Rogers, 2007).

The federal government has addressed obesity and lifestyle modification in its Healthy People 2010 and 2020 objectives, and the Institute of Medicine has called for providers to make excessive weight gain prevention a routine aspect of pediatric care (Clancy, 2011; Rodin et al., 2007). Experts agree that childhood obesity stems from poor lifestyle choices regarding diet and exercise (Kleinman, 2009). Personal behavior modification is difficult to achieve and maintain especially when motivation for change is low. Obesity is defined as having a body mass index (BMI) at or above the 95th percentile and overweight as having a BMI at the 85th to 94th percentile for gender and age (Barlow, 2007). Children with an elevated BMI should be counseled on diet and exercise at each encounter with their provider and offered more intense treatment as necessary using a stepwise approach to include family, community referral sources, pharmacological intervention, and possible surgery (Cook, Weitzman, Auinger & Barlow, 2005). However, health care providers are not consistent with counseling for treatment and fail to include evidence-based preventative measures to control obesity. There is little evidence that the usual care of pediatric patients have modeled best practice guidelines developed for more effective obesity management in the clinical setting (Barlow, 2007).
The pediatric office is an optimal place to initiate evidence-based obesity therapy; however, primary care systems have historically been ineffective at making practice changes to implement best practice guides (Daniels, Jacobson, McCrindle, Eckel, & Sanner 2009). Providers are frustrated because progress is slow, and patients many times do not follow diet and exercise prescriptions. Clinicians are sometimes of the assumption that a patient informed of the risks associated with unhealthy behavior will make appropriate behavior modifications. On the contrary, people are creatures of habit and simply knowing something is bad does not make them change behavior (Bundy, 2004). The patient needs to be ready and motivated to a make change before an intervention can be effective (Rodin et al., 2007). Motivational interviewing techniques along with gentle counseling have been effective in changing behavior and lowering body weight (Bundy, 2004; Rodin et al., 2007).

Review of the Literature

The National Association of Pediatric Nurse Practitioners’ (NAPNAP’s) evidence-based guidelines, Healthy Eating and Activity Together (HEAT), suggests the following steps to assist patients in moving toward positive health behavior changes: identify their readiness for change; consider the pros and cons of adopting healthy behavior; assess their confidence and perceived ability to make the change; and delineate a plan to remove barriers and make steps forward (NAPNAP, 2006). It is the lack of commitment and realistic goals that often lead to intervention failure (Barlow, 2007). Motivational interviewing targets dedication and attitude toward behavior modification (Bundy, 2004; Schwartz, 2010).

There are three styles of communication during motivational interviewing: following, directing, and guiding (Schwartz, 2010). Following allows the patient to give details of what is going on in his or her life that may help or hinder his or her adherence to a weight loss plan. Directing by the provider allows patients to understand risks associated with unhealthy behavior and what evidence-based healthy choices are available for them to choose from. Finally, guiding is used when the provider acts as a tutor while the patient decides which treatment options will fit into his or her lifestyle.

Description of the Study

This quality improvement study evaluated the effectiveness of using the HEAT program guidelines to treat overweight and obese children in the clinic setting (NAPNAP, 2006). These guidelines evaluate patient readiness and motivation for change. They further guide provider adherence to obesity counseling and evaluation of comorbid disease. Using the motivational interviewing technique following, patients were encouraged to give their own ideas of healthy changes that would work for them to achieve a healthier weight. With the directing technique, each patient and family were educated by the provider on five evidenced-based healthy lifestyle options and given the choice to incorporate one or more options into their daily life (Jelalian & Saelens, 1999). The options are the following: limit intake of sweetened beverages, limit television/video time to 1–2 hours a day, encourage 60 minutes of daily physical activity, portion size appropriate for age, and prepare and eat more meals at home (Stanford & Clements, 2007). The guiding technique helped the patients decide which healthy choices they were able to incorporate into their life and thereby create a self-directed provider-assisted plan for the patient to follow.

Methods

Setting

A private pediatric office located in rural Duplin County North Carolina was the study location. This practice serves approximately 3,500 White, Black, Hispanic, and biracial infants, children, and adolescents. The reimbursement mix is approximately 75% Medicaid, 20% private insurance, and 5% other payment sources. A family nurse practitioner provides 95% of the care, whereas the remaining 5% is shared by two pediatricians. Staffing consists of two receptionists, two RNs, and one licensed practical nurse. Duplin County has a high percentage of overweight and obese children similar to North Carolina State averages described in Table 1.

Planning and Intervention

To give comprehensive and quality care to obese and overweight children, our rural pediatric office implemented the NAPNAP’s HEAT evidence-based guidelines. All children with ages 5 to 18 years recognized as having a BMI at the 85th percentile or greater for their age were offered the chance to participate in Healthy Lifestyle (HLS) visits.

Under this practice change, when the identification of an elevated BMI was made, the patient and family were educated by the provider about the risk and potential health issues associated with excess weight gain. Following the HEAT guidelines, the provider assessed the patient for readiness to make healthy lifestyle choices in a nontargeting environment (Schwartz, 2010) by asking about the patient’s interest in monthly HLS appointments over the course of 6 months. HLS appointments entail patient and family education, body measurements (BMI, blood pressure [BP], and waist circumference), motivational score, and an initial and 6-month evaluation of laboratory studies.
including a fasting blood sugar, insulin level, c-peptide, liver function studies, and lipid panel.

On the first HLS visit, motivational interviewing techniques (following, directing, and guiding) were used to encourage the patient to verbalize the pros and cons of making healthy food and exercise choices. An assessment of their confidence and perceived ability to make the change was measured on a scale of 1 to 5, with 1 being least confident and 5 being most confident. Based on laboratory results and current lifestyle choices, a self-directed provider-assisted plan to remove barriers and move forward was created collaboratively by the patient, provider, and family.

When compared with children of average weight, many children who are obese have low self-esteem and altered body image. Depression, oppositional defiance, and poor school performance may also be a problem for them (Sullivan, 2010). At the first HLS visit, a depression assessment was made by the provider using seven questions pertaining to feelings of hopelessness, life and family changes, experience of bullying, and a loss of interest or pleasure in things. Overeating may be a sign of depression, and appropriate referral for psychotherapy was made if indicated (NAPNAP, 2006).

A three-generation family history, a detailed patient medical and psychosocial history, and a snapshot of current lifestyle habits including eating, physical activity, and television or other screen time were obtained by the nursing staff (Pott, Albayrak, Hebebrand, Pauli-Pott, 2009). Patients were asked to list specific people they felt would be most helpful and least helpful in their attempt at lifestyle changes. Because expert opinions suggest the inclusion of family in treatment, patients were encouraged to bring these people to subsequent visits if possible (August, 2008).

At each HLS visit, providers measured the patient’s BMI, BP, and waist circumference; provided counseling; and performed a confidence (1–5 scale) assessment regarding diet and exercise. Patients were asked to bring food and activity logs to HLS visits to assess dietary and exercise pattern changes that could be made. Motivational interviewing techniques helped the patient and family members to modify their own treatment plan, improving long-term sustainability of the healthy lifestyle choices by tailoring the plan to fit the patient’s daily life.

### Table 1: Patient Population Obesity Rates by County Compared With State

<table>
<thead>
<tr>
<th>Location</th>
<th>5–11 Years of Age</th>
<th>12–18 Years of Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina State</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>17.1%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Obese</td>
<td>25.8% (42.9%)</td>
<td>28.0% (46.1%)</td>
</tr>
<tr>
<td>Duplin County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>15.0%</td>
<td>15.9%</td>
</tr>
<tr>
<td>Obese</td>
<td>22.5% (37.5%)</td>
<td>34.9% (50.8%)</td>
</tr>
</tbody>
</table>

Note: Data from NC-NPASS (2009).

### Results

#### Sample Description

After exempt status was granted by the Institutional Review Board of Duke University, a convenience sample of 50 patients aged 5 to 18 years with a new diagnosis of overweight, obesity, and/or abnormal weight gain and made after the implementation of the HEAT guidelines were randomly selected by a staff nurse. All patient identifiers were removed by the nurse before a retrospective chart review was conducted and data analyzed by the reviewers. The mean age was 9.6 years, with an almost even mix of male \((n = 26, 52\%)\) and female \((n = 24, 48\%)\). The sample of children included 25 White \((50\%)\), 10 Black \((20\%)\), and 15 Hispanic \((30\%)\).

Patients attending the first HLS visit \((n = 38)\) had initial BMI ranging from 18 to 39. Waist circumference was collected on the 38 subjects and differentiated by percentile, with 87% greater than or equal to the 90th percentile and 13% less than 90th percentile. Patients were accompanied by their mother \((90\%)\), father \((8\%)\), and other caregiver \((2\%)\) on the initial visit for family historical data collection. The mean BMI calculated from parent’s self-reported height and weight indicates that the parents of an obese child in our sample are obese themselves \((parental BMI mean = 32, range = 21–44)\). Greater than 50% of the patients in the sample report a family history of obesity \((72\%)\), diabetes \((58\%)\), and hypertension \((68\%)\).

The assessment of the patients’ current unhealthy behaviors revealed that these children eat more than one serving at meals and snack \((72\%)\), eat at unplanned times \((50\%)\), eat when bored \((48\%)\), have a television in their bedroom \((54\%)\), and eat school lunch \((68\%)\). Sixty percent reported trying to lose weight in the past, and only half of the subjects report partaking in regular physical activity. Based on the initial depression assessment, the continuation of current psychiatric therapy was indicated for six patients, and a psychiatric referral was indicated for five additional patients.

Laboratory results were collected from 43 of the 50 patients in the sample. Of those completing the blood sampling, 17 \((40\%)\) had normal reports, 10 \((23\%)\) hyperlipidemia alone, 3 \((7\%)\) insulin resistance alone, 2 \((4.5\%)\) fatty liver disease alone, 3 \((7\%)\) fatty liver disease and insulin resistance, 3 \((7\%)\) fatty liver disease and hyperlipidemia, 2 \(C (4.5\%)\) insulin resistance and hyperlipidemia, and 3 \((7\%)\) fatty liver disease, insulin resistance, and hyperlipidemia.

#### Fidelity

All 50 subjects were seen by the nurse practitioner as a part of the HLS program, which included education about short-term problems associated with obesity and chronic disease risks. Subjects were then given the choice to...
Motivation and Compliance

Children and their families ($n = 47$) described themselves as motivated to make positive lifestyle changes when asked if they were motivated using a 1-to-5 scale, with 1 being least confident and 5 being most confident. Thirty-eight patients came to the initial HLS visit. Compliance rate (67%) for self-selected lifestyle modification was lower at the second HLS appointment in comparison to how successful the patients thought they would be based on their initial (3.95) motivational score. Average motivation scores went down on the second HLS visit (3.44) and the third HLS visit (3.22). Interestingly, patients that continued through the process showed higher and sustained motivation scores by the fourth (3.5), fifth (3.5), and sixth (3.5) monthly HLS visits.

Average initial BMI scores (26.6) dropped by the fourth HLS visit (26.1) for the six patients in the sample completing the first four HLS visits. The BMI scores either stayed the same or decreased for this group. There was one child who dropped from obese (>97th percentile) at the first visit to overweight (85–95th percentile) by the sixth HLS visit.

Discussion

Motivation

Adults, children, and families are influenced by their culture, personal beliefs, habits, and environments. For there to be sustainable change to their usual behaviors, people must understand and agree that there is a need to make a change. Moreover, they have to be motivated to make change. Many people say they want to make diet and exercise a priority in their life, but only the motivated few actually make change.

In this small retrospective sample, there were six patients who completed the fourth HLS visit. These subjects had high initial motivational scores, indicating that they were confident they could make a change. Adherence to change is difficult, and therefore, their confidence for success and compliance with selected healthy choices decreased on HLS Visits 2 and 3. However, motivation started to increase again by the fourth HLS visit when weight loss and decreased waist circumference measures were assessed in the clinic with patients having only moderate compliance with chosen healthy lifestyle practices. This revelation seemed to further increase motivation and patients’ compliance rate for selected lifestyle changes as shown in Table 2. There were five patients in the sample completing the fifth HLS visit (motivation score = 3.5) and two completing the sixth HLS visit (motivation score = 3.5), indicating they remained confident they could maintain change. Making and sustaining change are challenging, but success is a good motivator. Because the subjects were able to see weight loss, they remained confident they could continue to make healthy choices. Obstacles to change are abundant. In order for the pediatric provider to serve as an effective change agent, they must assess patient and family motivation to make change. Once the patient is ready to make change, the pediatric provider can be an integral part of the change process.

Education and motivational interviewing are powerful tools for the clinician in the pediatric office for evoking positive behavior changes in children and their families. Providers with busy schedules can incorporate motivational interviewing and counseling about weight at every encounter with patients. Sustained behavior change is hard to achieve, and it is frustrating for the clinician to see patients struggling with only small improvements in lifestyle behaviors. However, making even small changes in behaviors and BMI can result in significant health care recuperation.

Limitations

A longer survey time and a larger sample size would give us more information about compliance and variation in motivation during the change process. It is clear that evidence-based guidelines for the treatment of obesity can be implemented in the pediatric office. Children and their
families are interested in making positive lifestyle choices, but success depends on sustained motivation and environmental influences. Further study would give a better indication of trends in motivation and compliance with healthy lifestyle changes. Sustained and lifelong change is necessary for improving the future health of children.

Summary

American children have a shorter life expectancy than their parents, which is directly related to comorbidities associated with obesity. Even with this staggering revelation, providers of care are not consistent with counseling for healthy lifestyle choices. We found that the implementation of standard motivational interviewing techniques and family-centered education regarding healthy lifestyle choices can have an impact on the motivated patients’ ability to make sustainable change. Although the numbers are small, patients and families who are willing to change and given the option to create their own treatment plan are more likely to be successful at maintaining the planned change.

Focusing on personal motivation for change and involving the family in care are essential to improve the child’s ability to make healthy choices and maintain motivation for change. It is exciting to see a child learn healthy options and incorporate what they have learned into their daily life. More than once, a child brought his or her school lunch menu to his or her HLS visit to ask which foods were healthy options. Sadly, with foods like pizza, hot dogs, french fries, and tacos dominating the menu, there were very few items to suggest. The National School Lunch Program foods and other foods sold in cafeterias such as ice cream, fried chicken, and chips are contributing to the obesity epidemic.

Although expert guides suggest at least 1 hour of physical activity per day, only half the participants in our study report regular exercise. In Duplin County, the principal of each school has some control over how much time is allowed in the school day for physical education. These principals should be encouraged to allow the maximum number of minutes daily.

Mothers are very influential regarding their children’s diet and exercise behavior. They usually do the food shopping and prepare meals for the family. Mothers frequently work outside the home, making it a challenge for them to prepare healthy meals quickly and easily. However, preparing meals as a family is a good way to improve communication within the family and teach cooking techniques to the children. Shopping as a family encourages unity within the group and allows the parents to teach the children to read food labels. By learning what is in foods, children should understand that food is used for nutrition and not pleasure or comfort.

We used evidence-based guidelines to improve the treatment of childhood obesity in a small pediatric practice. The days of informing a patient they are overweight, handing them a diet and exercise guide, and then seeing them again in several months are over. Obese children and their families face multiple environmental obstacles when trying to make healthy lifestyle choices. Until the environmental issues are corrected, providers of health care in the pediatric office can make only small advances in the fight against obesity. Using evidence-based guidelines in the office is essential to competent clinical practice; however, clinicians need to be active community advocates for environmental changes that are conducive to a resolute and health conscious population. The things we incorporate in the plan of care in the office setting, though vital and fundamental, only scratch the surface of what needs to be done to eliminate childhood obesity in our society.

Recommendations for Further Research

Future work using a larger sample of children followed for an extended time interval would allow for a better understanding of the correlation between motivational interviewing and counseling in the pediatric office and the effect on weight loss in children. The addition of evidence-based practice changes in multiple clinical sites within a single community would provide a united health care front and could further improve the chance of community success in decreasing childhood obesity rates. The magnitude of the problem of childhood obesity requires a community-focused intervention with the primary pediatric provider as an integral player in the mix. Collaboration between competitive provider practice sites, the local school board, and recreational groups should be encouraged and evaluated. It is clear that a new way of treating obesity is necessary to ensure the health of our future generations.

Acknowledgments

This research was not supported by any grants or funding. The authors have nothing to declare.

Table 2  Motivational Score Compared With Healthy Lifestyle Choice Compliance

<table>
<thead>
<tr>
<th>HLS Visit</th>
<th>Motivational Score</th>
<th>Lifestyle Choice Compliance Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial HLS visit</td>
<td>3.95</td>
<td>n/a</td>
</tr>
<tr>
<td>Second HLS visit</td>
<td>3.44</td>
<td>67</td>
</tr>
<tr>
<td>Third HLS visit</td>
<td>3.22</td>
<td>30</td>
</tr>
<tr>
<td>Fourth HLS visit</td>
<td>3.5</td>
<td>94</td>
</tr>
<tr>
<td>Fifth HLS visit</td>
<td>3.5</td>
<td>Not reported</td>
</tr>
<tr>
<td>Sixth HLS visit</td>
<td>3.5</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

n = 38
n = 18
n = 9
n = 6
n = 5
n = 2
The authors would like to thank Dr. Donald M. Riddle, Dr. Chrisandra Sico-Davis, and Wanda Brinson for their encouragement and support of this project.

References


