Pediatric Nurse Practitioners’ Assessment and Management of Childhood Overweight/Obesity: Results from 1999 and 2005 Cohort Surveys

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ABSTRACT

Introduction: Recently, public and professional emphasis has been placed on addressing the increasing prevalence of childhood overweight.

Method: This survey study was conducted with two cohorts of pediatric nurse practitioners (N = 413) to explore differences in self-reported practice skills over time.

Results: Significant improvements in assessment, screening, and laboratory evaluations were reported, although reduced adherence to recommended psychosocial assessments was noted.

Discussion: This study outlines self-reported barriers to effective childhood weight management. One support that participants requested was evidence-based guidelines. Motivational interviewing may be an additional strategy to enhance provider skills to assess and manage challenging patient behavior change (e.g., dietary and activity changes). J Pediatr Health Care. (2009) 23, 231-241.

Key words: Childhood obesity/overweight, evidence-based guidelines, motivational interviewing, pediatric nurse practitioners

The prevalence of childhood overweight and obesity was fairly stable from 1960 through 1980, ranging from 4% to 7% of the child population (aged 6-19 years). Between 1988 and 1994, however, the prevalence increased to 11% and continued to surge to 16% from 1999 until 2002 (Forum on Child and Family Statistics, 2005). The factors that have contributed to this sudden increase are not clear. While health care providers are now routinely confronted with childhood overweight and obesity, limited treatment or prevention intervention strategies have been found to be effective in curbing this burgeoning child health dilemma (Small, Anderson, & Melnyk, 2007). Assessment and management guidelines for overweight and obese children have been developed by several
Obese children have a higher prevalence of physical health problems that may include hypertension, insulin resistance, dyslipidemia, metabolic syndrome, type II diabetes, and increased asthma symptoms (Barlow & Dietz, 2002; Behrman, Kliegman, & Jenson, 2004; Forum on Child and Family Statistics, 2005). These diseases, previously thought to affect only adults, now are being diagnosed in younger children (Washington, 2008). This finding is significant considering that approximately 21% of American preschool children, ages 2 to 5 years, have a body mass index (BMI) greater than the 85th percentile (Hedley et al., 2004; Ogden et al.). Overweight and obese children also disproportionately have mental health problems, such as disturbed body images, negative self-perception, low self-esteem, depression, and anxiety (Abraham, 2004; Behrman et al.; Wardle, Walker, & Fox, 2002). These mental health problems may be related to increased discrimination and poor peer relationships that these children endure (Abraham) as well as the body's physiologic response to excess adipose tissue (Daniels, 2006).

In response to the rapid rise in excess adiposity in children, which became apparent in 1994, a section of the Department of Health and Human Services convened a panel of experts in the field of child and adolescent obesity in 1997 (Barlow & Dietz, 1998; Cook, Weitzman, Auinger, & Barlow, 2005; Sokol, 2000). The result of this meeting was the development of several recommendations (published in 1998) to guide physicians, nurse practitioners, and nutritionists in the evaluation and treatment of overweight children, teens, and their families (Barlow & Dietz; Cook et al.; Sokol).

During the same time period, childhood overweight and obesity has become a focus of media attention in an attempt to raise the awareness of health care providers and the public (Action for Healthy Kids, 2006; Taubes, 2002). Pioneers in the medical field began to speak out against the rising incidence of childhood obesity in the 1990s by making public the rising prevalence data and publishing expert recommendations (Barlow & Dietz, 1998; Taubes). The news media soon followed suit with steadily increasing numbers of journal and news articles. Recently, the North American Association for the Study of Obesity (NAASO) reported that the number of obesity-related articles in U.S. newspapers and journal articles has more than tripled in the 5-year period between 1999 (8,000 articles) and 2004 (30,000 articles; NAASO, 2007).

Despite the increase in information available, the prevalence of overweight and obese children and adolescents continued to climb as indicated by data published in

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overweight and obesity continue to fall short of recommended practice (Barlow, Dietz, Klish, & Trowbridge, 2002; Cook et al., 2005; O’Brien, Holubkov, & Reis, 2004). These studies identified several barriers to the assessment and treatment of childhood overweight and obesity (including limited time to conduct assessments and lack of clinician knowledge about treatment). These barriers potentially threaten health care providers’ motivation or their ability to become more aggressive in their identification and management of childhood overweight and obesity. Additionally, practitioners have reported inconsistencies in their evaluation and treatment of overweight children and adolescents, indicating that they may not feel prepared to effectively oversee the health care of these children. Health care providers may acknowledge the looming epidemic; however, some studies have suggested that providers may struggle with how to affect this critically emerging health care dilemma (Vaughn, 2005). Furthermore, findings from one study demonstrate that many health care providers are not aware of or fully adherent to the expert recommendations or evidence-based guidelines regarding childhood obesity (Kolagotla & Adams, 2004). Gaps in knowledge and practice inconsistent with expert recommendations and research evidence are likely to result in inadequate or delayed recognition of excess child weight or unhealthy weight gain and thus limit the effectiveness of early prevention or treatment strategies.

Trowbridge and colleagues conducted a survey of pediatricians, pediatric nurse practitioners (PNPs), and registered dieticians in 1999 (Barlow et al., 2002; Jonides, Bushbacher, & Barlow, 2002; Story et al., 2002; Trowbridge, Sofka, Holt, & Barlow, 2002), one year following the publication of the expert recommendations. The survey, developed by a panel of pediatric overweight/obesity experts, was designed to evaluate health care providers’ assessment and management practices related to childhood overweight and obesity. This survey was conducted during a period when the prevalence of childhood obesity was just beginning to rise and public awareness campaigns were beginning to emerge. It is critically important to understand the current state of health care provider practice—specifically, assessment and management practices regarding childhood overweight and obesity and the self-reported barriers and practice changes that may have occurred during this period of heightened public awareness and increasing prevalence. This study aims to: (a) identify practitioners’ current assessment and management practices of childhood overweight and obesity compared with expert recommendations, (b) delineate practitioners’ perceived barriers in addressing this issue with their patients and parents, and (c) compare the degree of adherence of these reported practice behaviors to recommended management guidelines.

Design
Following study review and approval by a university Institutional Review Board, PNPs were asked to complete an anonymous survey during the 2005 NAPNAP Annual Conference. The questionnaire, Assessment of Overweight in Children and Adolescents, was the same as that used to survey PNPs, physicians, and registered dieticians by Trowbridge and colleagues in 1999 (Trowbridge et al., 2002). In this way, current practices and barriers could be identified and the aggregate data from the two different cohorts of PNPs (survey results from 1999 and 2005) could be compared and contrasted in relation to expert recommendations to determine if appreciable practice changes had occurred.

Sample
The first survey was conducted in 1999 by Trowbridge and colleagues (Barlow et al., 2002; Jonides et al., 2002; Story et al., 2002; Trowbridge et al., 2002) and resulted in a convenience sample of 293 PNP respondents, which represents a 33% response rate, from an anonymous mailed national survey to physicians, PNPs, and registered dieticians. With the permission of Drs. Barlow and Jonides and the International Life Sciences Institute (ILSI), data from the PNP cohort was extracted from that data set for use in this study.

The sample for the 2005 cohort was comprised of those PNPs who completed the survey disseminated at the NAPNAP Annual National Conference held in Phoenix, Arizona. All conference attendees were provided with a survey in the packet of information received upon conference registration (N = 1000). A large and colorful receptacle was placed adjacent to the daily sign-in area as a prominent reminder for participants to complete and submit the survey. One hundred twenty-seven surveys were returned for a response rate of 12.7%. Of the returned questionnaires, seven had been completed by family nurse practitioners or PNP students and, in accordance with the participation criteria of this study, were excluded. This resulted in a final PNP response rate of 12%. None of the 2005 survey respondents had participated in the earlier survey. It is unclear why the response rate for this survey was low; however, participants in this Annual Conference were a subset of a nationally representative group of PNPs and thus were similar to those who participated in the 1999 survey. A total of 413 PNPs participated in these two cohort surveys (1999 and 2005). Power analysis was not conducted prior to either cohort study.

Measurement
The Assessment of Overweight in Children and Adolescents questionnaire (Trowbridge et al., 2002) was developed in 1999 by
a multidisciplinary panel of child health professionals that included nurse practitioners, dietitians, physicians, researchers, educators, and representatives of the Maternal and Child Health Bureau, Health Resources and Services Administration, the National Center for Education in Maternal and Child Health, the ILSI Research Foundation, and Harris Interactive, Inc. The questionnaire was designed to measure the overall experiences, attitudes, and treatment strategies (e.g., assessment and management strategies for child overweight/obesity) of pediatric health care providers, and item responses allow participants to indicate how often they complete specific tasks on a five-point Likert-type response set, with end anchors of most of the time (1) to never (5). For example, the survey contained questions such as, “When you treat overweight children and adolescents, how often do you use the following treatments?” The survey then included several potential treatment responses such as changes in eating patterns or increase in routine activity. This questionnaire was reviewed by the Epidemiology Group at the University of Minnesota for wording and response options. Although to date no reliability data (e.g., Cronbach’s α) have been reported on this measurement tool or its many subscales, this tool has excellent face validity because it was developed and reviewed by a diverse group of experts.

**Data Reduction and Aggregation**

Based on the series of articles published by Trowbridge and colleagues (2002) regarding the practice behavior skills of screening and treatment of overweight and obesity among children and adolescents, variables were created representing the proportion of time the practitioners were adherent to the recommendations put forth by the Expert Committee in 1997. For each item a dichotomous variable was created to indicate adherence to the guidelines (0 = non-adherent; 1 = adherent). Aggregate variables then were created that represented the average proportion of time the practitioner was adherent to the guidelines over all items for that construct. Because the questionnaire originally was not designed to be used as a research instrument, no psychometric analyses were conducted on the original data.

**Psychometric Analyses of Barrier Items**

We were interested in identifying the underlying concepts represented by the barrier items and so a factor analysis was conducted on the nine barrier items using the 1999 cohort data. A minimum eigenvalue of 1 was specified with varimax rotation and yielded two primary factors: (a) a health care systems barrier factor (V = 7) and (b) a parent barrier factor (V = 2). The health care systems barrier factor, or factors in the health care system identified as barriers (e.g., lack of clinician time), accounted for 3.03% of the variance, with items having factor loadings ranging from .44 to .89, and the Cronbach’s α for this factor was .75. The parent barrier factor, or parent-related factors identified as barriers (e.g., lack of parent involvement in treatment), accounted for 1.78% of the variance, and the factor loadings were .85 and .86. The Cronbach’s α for this factor was .62 (Table 1).

### Statistical Analyses

Following univariate analysis of demographic, assessment, and management practice items and identified barriers to care, independent sample t tests were conducted using SAS V9.1 to examine differences between 1999 and 2005 survey participants for the continuous variables. A P value of .05 was used as the criteria for determining statistically significant results.

### RESULTS

**Demographic Information**

The sample of 120 PNP s who responded to this questionnaire in 2005 was predominantly female and reported practicing in general pediatric primary care for 15 years or less (Table 2). These respondents were very similar to the original data.

<table>
<thead>
<tr>
<th>Barrier Items</th>
<th>Cronbach’s μ</th>
<th>1999 Percent</th>
<th>Cronbach’s μ</th>
<th>2005 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health care system barriers</td>
<td>α = .75</td>
<td>57.00</td>
<td>α = .76</td>
<td>65.00</td>
</tr>
<tr>
<td>Lack of support services</td>
<td></td>
<td>52.62</td>
<td></td>
<td>52.50</td>
</tr>
<tr>
<td>Futility</td>
<td></td>
<td>46.81</td>
<td></td>
<td>62.93</td>
</tr>
<tr>
<td>Lack of reimbursement</td>
<td></td>
<td>45.86</td>
<td></td>
<td>50.42</td>
</tr>
<tr>
<td>Lack of clinician time</td>
<td></td>
<td>32.19</td>
<td></td>
<td>29.17</td>
</tr>
<tr>
<td>Lack of clinician knowledge regarding</td>
<td></td>
<td>31.95</td>
<td></td>
<td>28.81</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td>12.84</td>
<td></td>
<td>13.16</td>
</tr>
<tr>
<td>Concern regarding precipitating eating</td>
<td></td>
<td>82.53</td>
<td></td>
<td>88.99</td>
</tr>
<tr>
<td>disorders</td>
<td>α = .62</td>
<td></td>
<td>α = .61</td>
<td></td>
</tr>
<tr>
<td>Lack of parent involvement in treatment</td>
<td></td>
<td>78.16</td>
<td></td>
<td>85.83</td>
</tr>
</tbody>
</table>

*Proportion of respondents who reported these barriers frequently (most of the time [1] and often [2]) prevented effective treatment.
1999 cohort with regard to gender, practice focus, and length of time in practice, as shown in Table 2. It is interesting to note, however, that approximately 41% of PNPs participating in the 1999 study had been in practice for 5 years or less, compared with only 20% of PNPs in the 2005 study who had been in practice for 5 years or less.

**Reported Assessment and Management Strategies in Relationship to Expert Recommendations**

The results of independent samples t tests are presented in Tables 3, 4, and 5. While there was a significant improvement in adherence to the expert recommendations from 1999 to 2005 for assessing child/teen overweight (35.33% vs. 48.97%, t = −8.03, P < .0001), adherence was still less than 50% (Table 3). There were significant improvements in reported adherence for the screening for co-morbid medical conditions (45.30% vs. 55.36%, t = −10.06, P = .0004) and laboratory evaluations for those comorbidities (45.20% vs. 62.52%, t = −17.31, P < .0001). There was, however, an 8% reduction in adherence to the expert recommendations for psychological, emotional, and behavioral assessments (87.57% vs. 79.83%, t = 7.74, P = .0008) during this 6-year period. Slight improvements were noted in the recommended and reported assessment of family medical history and physical activity, but these changes failed to reach statistical significance (Table 3). Perceived barriers associated with parent interactions (e.g., lack of parent motivation) and with the health care system (e.g., time allocated for visits and limited remuneration) limiting the care of overweight or obese children and teens increased during the 6-year time; however, this change did not reach statistical significance (t = −1.68, P = .09; t = −1.60, P = .11, respectively; see Table 4).

**DISCUSSION**

The methods for assessing overweight in children and teens reported by these pediatric health care professionals have changed over time since the implementation of expert panel recommendations in 1998. Weight-for-age percentile continues to be the most frequent expert recommendation related to physical activity and nutrition for children (Centers for Disease Control and Prevention [CDC], 2005) to promote healthy weight gain have been widely disseminated, and thus it was not surprising that adherence to the recommendations for nutritional and physical activity treatment approaches for the adolescents was quite high at both time periods (>94%; Table 5) and that the differences between 1999 to 2005 were not statistically significant. Differences in adherence were noted over the 6-year period regarding the provider-reported frequency of nutritional and physical activity treatments (e.g., “How often did you recommend limitations of specific foods?”) implemented for the subset of school-aged and preschool children. In 1999, PNPs reported treating overweight preschool children less frequently through the use of nutritional and activity counseling than they treated overweight school-aged children or teens. It should be noted that these reported treatment rates held steady for overweight teens and school-aged children in 2005 but the reported frequency of treatment for overweight preschool children increased, a positive change that was marginally significant (P = .08 and P = .10, respectively; Table 5). Adherence to the nutritional and activity treatment recommendations, however, was significantly lower for overweight preschool children compared with the overweight school-aged and adolescent subgroups in both cohorts (Table 6).
assessment method used. BMI and BMI percentile were reported to be two of the three most frequently cited measures of weight and adiposity, which is consistent with expert recommendations and newer evidence-based practice guidelines. Cutoff values for BMI and BMI percentile that suggest “overweight” or “at risk for overweight” identified by the later survey participants match the CDC recommendations more closely than they did in 1999. This finding is of importance because BMI and BMI percentile measurements are the recommended method for defining overweight according to the CDC (2006). However, fewer than half of the participating PNPs reported that they determined BMI or BMI percentile for their patients.

The PNPs who responded to the 2005 survey reported an increase in the frequency of assessments and laboratory screening for co-morbid conditions associated with overweight and obesity (i.e., hypertension, sleep disorders, type II diabetes, dyslipidemia, and other endocrine disorders); this practice change is more in alignment with expert recommendations and the more recently published evidence-based guidelines (NAPNAP, 2006). While reports of family history assessments did not demonstrate statistically significant increases over time, the 2005 sample reported an increased frequency in obtaining family histories of dyslipidemia, diabetes, and other endocrine abnormalities with their overweight patients. This combination of findings suggests that these practicing professionals may be more aware of the connection between excess weight, metabolic syndrome, and type II diabetes.

Another interesting finding of this study is that PNPs in both cohorts reported lower levels of adherence with the counseling treatment recommendations (e.g., nutrition and activity; Tables 5 and 6) in preschool children compared with adherence with the same treatment recommendations for school-aged children and adolescents. This finding is concerning given the increasing prevalence of overweight and obesity in preschool children (Hedley et al., 2004; Ogden et al., 2006). It may be the case that this type of counseling with parents of young children is fraught with difficulties (e.g., parent/patient disinterest, lack of support services, and limited reimbursement) such that the challenge of addressing these issues is perceived as an overwhelming barrier. In light of the limited amount of time a clinician can spend with each patient and the increased assessments the PNPs reported in 2005 (e.g., a significant rise in BMI and BMI percentile assessments and increases in assessments for medical comorbidities of overweight and obesity), it also may be that these practitioners focused their time on ensuring that medical complications of excess weight have not occurred in their younger patients. Another possible explanation may be that preschoolers are believed to be self-limiting in their dietary intake and normally very active. Recent research, however, suggests that environmental cues override children’s internal satiety signals by approximately 4 years of age (Fisher, Rolls, & Birch, 2003; McConahy, Smiciklas-Wright, Birch, Mitchell, 2003).

| TABLE 3. Adherence to Expert Committee Recommendations for the assessment of overweight children and adolescents |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Assumption of overweight | 1999 M (SD) | 2005 M (SD) | Mean difference (SD) | t | P |
| Assessment of overweight | 35.33 (15.73) | 48.97 (15.58) | −13.64 (15.68) | −8.03 | <.0001 |
| Medical condition screening | 45.30 (25.68) | 55.36 (25.63) | −10.06 (25.66) | −3.59 | .0004 |
| Laboratory evaluations | 45.20 (18.42) | 65.52 (19.36) | −17.31 (18.71) | −8.37 | <.0001 |
| Psychological, emotional, and behavioral assessment | 87.57 (19.33) | 79.83 (23.54) | 7.74 (20.61) | 3.39 | .0008 |
| Assessment of family history | 73.59 (26.39) | 78.05 (20.90) | −4.46 (24.95) | −1.61 | .11 |
| Physical activity assessment | 93.95 (17.45) | 95.00 (14.13) | −1.05 (16.66) | −0.58 | .57 |

| TABLE 4. Barriers to the assessment and management of overweight children and teens |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Perceived parent- associated barriers | 1999 M (SD) | 2005 M (SD) | Mean difference (SD) | t | P |
| 3.14 (0.64) | 3.25 (0.64) | 0.12 (0.64) | 1.68 | .09 |
| Perceived health care system- associated barriers | 2.28 (0.53) | 2.37 (0.64) | 0.09 (0.53) | 1.60 | .11 |

Fewer than half of the participating PNPs reported that they determined BMI or BMI percentile for their patients.
of recommended interventions, (c) lack of reimbursement, and (d) lack of provider time. However, more than 80% of the respondent PNs at both time points indicated that the parent-associated barriers curtailed effective treatment efforts. The perception of parents as barriers and the sense of treatment futility may indicate that different practice skills or techniques are needed.

One theoretical perspective that may guide the future development and testing of interventions for providers to enhance the care of overweight/obese children is the Information-Motivation-Behavior (IMB) Skills model. The IMB framework conceptualizes the psychological determinants of behavior (e.g., provider practice) and provides a general framework for understanding and promoting health-related behavior change (Fisher & Fisher, 2002). The model focuses on the informational, motivational, and behavioral skill factors that are conceptually and empirically associated with health-related behaviors (e.g., prior practice behavior) and asserts that information, personal motivation (e.g., attitudes and beliefs) and behavior skills (e.g., behavioral and nutritional counseling techniques) are the fundamental determinants of behavior. In essence, effects of information and motivation are expressed mainly as a result of the development and deployment of behavioral skills that are directly applied to the initiation and maintenance of new behaviors (e.g., calculation of BMI percentile for each child and early identification of obesity and its co-morbid consequences). As a partially mediating model of behavior change, behavior skills (the mediator; e.g., practice behavior skills) should be a major consideration during intervention development. This model has successfully guided a variety of intervention studies with chronic, recalcitrant health behavior requiring lasting patient behavior change (Bryan, Fisher, & Murray, 2000; Robertson, Stein, & Baird-Thomas, 2006; Small, Melnyk, & Strasser, 2007).

The perception of parents as barriers and the sense of treatment futility may indicate that different practice skills or techniques are needed.
skills) is an essential first step toward developing effective intervention strategies. To overcome parent-associated barriers, newer practice skills such as Motivational Interviewing should be considered as a method to increase parent involvement and motivation. Motivational Interviewing is a patient-focused communication method in which patients (or parents in the case of young children) are encouraged to set goals, identify personal barriers, and identify potential ways to overcome those barriers (Rollnick & Miller, 1995). This practice style, even in its brief form, has resulted in more positive, long-lasting client behavior changes for a variety of chronic health conditions (Channon et al., 2007; Schwartz et al., 2007). Trying a different communication style with patients and their parents may result in greater effectiveness of interventions and a decreased perception of treatment futility.

A few negative changes were noted during this critical 6-year period. Of greatest concern was the decrease in the frequency of psychosocial evaluations for the 2005 study cohort compared with the 1999 study group (79.83% vs. 87.57% adherence with practice recommendations, respectively), a decline that reached statistical significance ($P = .0008$). This finding is discouraging given the evidence supporting an important link between the presence of mental health issues and overweight/obesity. Increasing empirical evidence supports approaches to true and lasting health behavior change that are person-centered and based on the individual’s current state and their readiness or motivation to change (Fisher & Fisher, 2002; Francis et al., 2005; Grimley, Riley, Bellis, & Prochaska, 1993). The 2005 PNP respondents were less likely to assess overweight children for poor self-esteem, eating disorders, depression, history of abuse, readiness to make changes to manage weight, parental or patient concern about child weight, being teased about weight, and family dynamics. This result was unexpected given the current high levels of mental health problems in children and adolescents and the frequency with which health care providers are called on to assess for mental health issues. Facilitating behavior change that results in increased self-care activities (e.g., healthier nutritional intake and activity habits) should enhance overall mental health and result in changes in weight status.

It is important to note that 95% to 97% of both PNP samples (1999 and 2005, respectively) indicated that professional practice guidelines would improve their ability to treat overweight children and adolescents, even though expert recommendations and guidelines were available at both time points. This finding underscores the importance of continuing efforts to disseminate the most current practice guidelines for the prevention and treatment of child overweight and obesity (e.g., the Healthy Eating and Activities Together [HEAT] Guidelines; NAP-NAP, 2006), especially those based on research evidence. Easily applicable, evidence-based guidelines have the potential to affect the dramatically rising rates of childhood overweight and obesity.

### Limitations

Generalizability of the findings of this cohort study is limited because only PNP responses were included and respondents were self-selected. Furthermore, the response rates from the 2005 sample were low, suggesting that there may be unique differences and thus response bias in this self-selected group. Therefore, conclusions cannot be drawn that all PNP practice has improved with regard to the assessment and management of childhood and adolescent overweight and obesity as it has in this study. Because survey completion can be associated with personal motivation and convenience, future studies could address the low survey response by using alternative methods to encourage greater numbers of PNPs to complete such surveys. And while no causation can be suggested because this was a cross-sectional cohort study that used data from two different...
nationally representative samples, this study does provide some preliminary evidence that PNP practice may be changing as these health care providers begin to engage in newer behavior skills in their attempt to address the overwhelming crisis of childhood/adolescent overweight/obesity.

**Directions for Future Research**

There is an urgent need for high-quality evidence upon which pediatric health care providers can base their assessment and management strategies for overweight and obesity among children and adolescents. The areas for potential research that may enhance practitioners' abilities to work with children and families to curb this rapidly increasing health phenomenon are numerous. It can be suggested from the findings of this study (e.g., decreased psychological, emotional, and behavioral assessments; less treatment counseling reported for young children compared with teens; and high levels of reported parent-associated barriers) that behavior skills training for providers focused on behavioral and psychosocial assessments and management strategies (e.g., Motivational Interviewing) may be a key provider-focused intervention to be further developed and tested. This training is particularly important because childhood obesity is associated with psychosocial risks such as major depressive disorders, suicidal ideation, and suicide attempts (Schumann, Nichols, & Livingston, 2002).

Furthermore, it would facilitate the care of overweight children if the barriers to effective provider care could be decreased. This study identified parent- and health care system–associated barriers. Testing the effects of child overweight treatment interventions initiated in primary care settings may produce the evidence necessary to increase remuneration for effective provider services, thereby providing clinicians the necessary time to address this complex issue. Additionally, trials of novel interventions strategies (e.g., online services for overweight children and their parents, healthy weight referral services for children of all ages, and in-home nurse visitation for healthy lifestyle counseling) may ultimately increase provider access to support services and enhance care of overweight children. The futility providers reported feeling as they frequently confront this looming health problem can be alleviated by the development and deployment of provider support services and more complex strategies stemming from multidisciplinary teams of professionals that address this issue at many different levels (e.g., legislative efforts, school-based interventions, and public awareness campaigns). Identification and stratification of barriers perceived by PNPs is an important step toward the development and testing of provider-focused interventions that address issues that may impinge on a provider's motivation to implement assessment and treatment behaviors urgently needed by overweight children, teens, and their families.

Most importantly, future research should study the effectiveness of the recommendations for the assessment and management of child/teen overweight and obesity developed by expert committees and previously developed evidence-based practice guidelines. The 2005 cohort study findings suggest that, overall, respondents reported increased adherence to expert committee recommendations; however, the incidence of childhood and adolescent overweight continues to rapidly increase. This situation underscores the urgency to offer providers more effective methods to deal with this health care crisis. Caution should be taken when generalizing the findings of this study because of the limited sample size, self-selected study participation, and self-reported nature of these data; therefore, it is recommended that this study be replicated with larger samples to identify practice skill and behavior changes by PNPs and other health care providers.

NAPNAP (2006) recently published the HEAT evidence-based clinical practice guidelines. These guidelines outline the best evidence-based practices for assessment and management of child/teen overweight. Repeating this survey following the release of these guidelines would provide a timely assessment of their effect and the state of PNP attitudes, beliefs, and practice behaviors, as well as perceived barriers to best practices.

**Implications for Practice and Education**

Although this study is small, PNPs should be aware of these results so that they recognize the significant improvements in practice behaviors (e.g., assessment and management) in relationship to expert recommendations that have occurred during the 6 years that have elapsed between two surveys of nationally representative PNP samples and are informed of reported practice barriers. PNPs then can compare these findings to their own practice behaviors to identify potential areas in which they might strengthen their skills and thus their care of overweight children. Reviewing the most current evidence-based practice guidelines may assist readers in addressing weaknesses and/or gaps in their knowledge and facilitate practice based on the evidence. Utilizing available tools (e.g., the HEAT guidelines) and practice delivery techniques (e.g., Motivational Interviewing) to enhance current practice skills may result in improved patient outcomes such as healthy weight attainment and maintenance. These preliminary study findings also suggest that PNPs may need to increase the amount of attention they place on the assessment of psychosocial/mental health concerns when
caring for overweight children and teens. Two NAPNAP initiatives, the HEAT initiative (NAPNAP, 2006) and the Keep yourself/your children Safe and Secure (KySS) campaign (Melnyk & Moldenhauer, 2005), recently have been developed to address the issues of overweight and mental health, respectively, in children, teens, and families. Findings from this study provide support for these two initiatives and offer more information that may further enhance their development.

SUMMARY

Little is known about current PNP practices and perceived barriers regarding the assessment and management of childhood and adolescent overweight and obesity. Available research, however, has suggested that recommended guidelines are not being fully implemented and adhered to (Bauer, 2002; Cabana et al., 1999; Cook et al., 2005), suggesting that provider practice behavior skills need to be strengthened. Continuing education offerings and conference forums might be used to provide the most up-to-date information about new practice techniques and provide participants the opportunity to practice those new skills. These and other opportunities (such as Web-based programs and frequently updated Web sites) may offer information to assist providers in overcoming frequently encountered barriers (e.g., billing codes frequently accepted by third-party payers and methods to track patient outcomes following treatment sessions) to decrease the sense of futility when working with overweight children and their families. Multiple strategies will be needed to address the increased prevalence of childhood overweight and obesity and the growing prevalence of associated co-morbid health conditions occurring in the child population. Pediatric health care providers have frequent contact with many children and families and thus are in a unique position to affect child health at the individual or family level. Additionally, through active involvement in various professional and community organizations, child health care providers can provide accurate information regarding the increasing prevalence of child overweight and obesity to parents and families, which may affect parental attitudes and recognition of this national health dilemma.

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REFERENCES


