

RESEARCH

Childhood obesity: Prevention practices of nurse practitioners

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Abstract

Purpose: The purposes of this study were to (a) describe the prevention practices of nurse practitioners (NPs) regarding childhood obesity, (b) compare the practices of NPs by specialty, practice setting, and awareness of childhood obesity prevention guidelines, (c) identify relationships between prevention practices and demographic variables of NPs, and (d) examine the resources for and barriers to implementing prevention practices.

Data sources: A convenience sample of 99 family NPs (FNPs) and pediatric NPs (PNPs) from the Intermountain area was used. Participants completed a questionnaire based on documented risk factors for childhood obesity as well as prevention guidelines developed by the American Academy of Pediatrics (AAP).

Conclusions: NPs working in family practice or general pediatric practice settings were not consistently using the BMI-for-age index to screen for childhood obesity, as recommended by the AAP. However, they were teaching parents to promote healthy food choices and physical activity in their families. PNPs and FNPs working in a pediatric practice setting and NPs who were aware of prevention guidelines were more likely to perform several prevention strategies than FNPs working in a family practice setting and those who were unaware of guidelines. Major barriers to implementing childhood obesity prevention strategies included parental attitudes, the American lifestyle, and lack of resources for both the NP and the family. The main resources NPs used in preventing childhood obesity were a dietician, journal articles, and Web sites.

Implications for practice: Although the majority of the NPs in this study reported being aware of childhood obesity prevention guidelines (73.7%), most were not consistently using BMI for age or monitoring children at increased risk for obesity. Because childhood obesity is escalating at such a rapid rate, it is critical that NPs working in family practice and pediatric practice settings take the necessary steps to help curtail obesity in childhood, including calculating BMI for age, targeting children at risk, and helping families develop healthy nutrition and physical activity habits. In addition to proper health supervision of children, NPs also need to be advocates in their communities to overcome barriers to childhood obesity prevention.

Introduction

Childhood obesity and overweight are defined by the Centers for Disease Control and Prevention (CDC) as a body mass index (BMI) greater than or equal to the

95th percentile for children and adolescents of the same age and gender (American Academy of Pediatrics [AAP], 2003; CDC, 2003b). Children and adolescents of the same age and gender who have a BMI between the 85th and

95th percentiles are considered at risk for being overweight (AAP; CDC, 2003b). The CDC does not include a cutoff between overweight and obesity for children in its definition. Accordingly, the terms obesity and overweight are used interchangeably. Childhood obesity is a significant healthcare issue, and the prevalence of childhood obesity in the United States is rapidly increasing (CDC, 2003a, 2003b; Moran, 1999). Data from the 1999–2000 National Health and Nutrition Examination Survey show that 15.3% of children aged 6–11 years and 15.5% of children aged 12–19 years are overweight. Another disturbing finding is that the prevalence of overweight children aged 2–5 years has increased from 10.6% in 1992 to 13.4% in 2001 (Polhamus et al., 2003). Finally, it is important to note that the prevalence of obesity is increasing faster among African American and Hispanic children than among Caucasian children (CDC, 2003a; Rocchini, 2002; Strauss, 2002). Native Americans have a high prevalence of overweight as well (Polhamus et al.).

The dramatic rise in childhood obesity cannot be ignored because the literature indicates that childhood and adolescent obesity often continue into adulthood and are associated with considerable morbidity and increased mortality (AAP, 2003; Goldfield, Epstein, Kilanowski, Paluch, & Kogut-Bossler, 2001; Stephens, 2002; Strauss, 2002). Specifically, obese children are at risk for a variety of cardiovascular health problems, including diabetes, hypertension, dyslipidemia, and coronary artery disease (AAP; Rocchini, 2002; Strauss; Styne, 2001). Orthopedic problems, skin disorders, polycystic ovary syndrome, irregular menses, gallstones, steatohepatitis, asthma, sleep apnea, and severe emotional distress are other possible complications of childhood obesity (AAP; Moran, 1999; Strauss; Styne).

Considering the many health problems associated with childhood obesity, it is essential to examine risk factors linked to the condition. Some literature indicates that the rapid rise in childhood obesity is because of current environmental and social trends. For example, children are spending more time watching television, playing video games, and using the Internet than children in the past (AAP, 2003; Berkey et al., 2000; Crespo et al., 2001; Epstein, Paluch, Consalvi, Riordan, & Scholl, 2001; Roberts, 2000; Stephens, 2002; Strauss, 2002). Children watching television 4 or more hours per day have a higher prevalence of obesity than do children who watch television for less time (AAP; Crespo et al.), and studies show that limiting television viewing can help in both the prevention and treatment of obesity (AAP; Berkey et al.; Crespo et al.; Faith et al., 2001). In addition to excessive television watching and other sedentary behaviors, children today are eating more high-calorie foods than they did in the past. Television ads and easy access to fast-food

restaurants are related to the increased consumption of high-calorie and high-fat foods (Epstein et al.; St-Onge, Keller, & Heymsfield, 2003; Strauss).

Parental obesity also increases the likelihood of obesity development in children. In fact, a high parental BMI is one of the strongest predictors of childhood obesity (AAP, 2003; Danielzik, Langnase, Mast, Spethmann, & Muller, 2002), and children whose mothers are obese or children whose parents are both overweight are at greatest risk for developing obesity (AAP; Maffei, Talamini, & Tato, 1998; Strauss & Knight, 1999). Although studies have indicated that a genetic predisposition to obesity may exist, it is the interaction of genetic and environmental factors that causes obesity (AAP; Maffei, 2000) because children often follow examples set by their parents (Golan & Weizman, 2001; Strauss, 2002; Wardle, Guthrie, Sanderson, Birch, & Plomin, 2001).

Another important risk factor for childhood obesity is low socioeconomic status (SES) (AAP, 2003; Wang, 2001). Children from low-income households are more likely to become overweight than are children from higher-income households. Food insecurity and not having access to healthy food choices are reasons for this situation (AAP). Children from low-income families also do not have as many safe places for physical activity, which could prevent weight gain (AAP; Strauss & Knight, 1999).

The literature also indicates that maternal child feeding practices and highly controlling feeding practices, such as prompting a child to clean his or her plate and using food as punishment or reward, may be related to the development of childhood obesity. (AAP, 2003; Barlow & Dietz, 2002; Baughcum et al., 2001; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002). It is interesting to note, however, that many mothers of overweight children do not perceive their children as being overweight even when growth charts reveal otherwise (Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000; Contento, Basch, & Zybert, 2003; Jain et al., 2001).

In response to the concern about the rising prevalence of childhood obesity, in August 2003, the AAP developed a policy statement challenging physicians to make screening and counseling of families for childhood obesity a regular part of well-child examinations. The policy also outlined several recommendations for healthcare professionals (HCPs) concerning childhood obesity prevention, including using BMI for age, promoting nutrition and physical activity, discouraging heavy television viewing, and educating parents whose children are identified as being at risk.

Once a child has become overweight, treatment to decrease weight is very difficult and often unsuccessful (AAP, 2003). Thus, it is crucial to take appropriate steps to

halt weight problems before they occur. Primary HCPs working in family practice and general pediatric practice settings are in a unique position to educate and counsel families regarding healthy lifestyle habits. However, one wonders if these HCPs are truly taking appropriate steps in their practice to implement the recommendations. Story et al. (2002) surveyed pediatric nurse practitioners (PNPs), pediatricians, and registered dietitians across the United States about barriers they face in managing childhood obesity. The researchers found lack of parent involvement, lack of patient motivation, and lack of support services to be the most common barriers. Other obstacles included lack of reimbursement and lack of time. In addition, their results revealed that the HCPs had low self-efficacy in the use of behavioral management strategies, counseling about parenting skills, and addressing family conflicts. This study, like others, however, focused on the treatment of childhood obesity rather than on prevention (Barlow & Dietz, 2002; Barlow, Dietz, Klish, & Trowbridge, 2002; Barlow, Trowbridge, Klish, & Dietz, 2002; Story et al., 2002). Although it is true that many treatment approaches also may be prevention approaches, these studies did not discuss more specific prevention strategies. While Story et al. identified areas of training needs for nurse practitioners (NPs) and other HCPs in managing childhood obesity, no studies to date have described actual prevention strategies NPs use in their practices. Therefore, the purposes of this study were to (a) describe the prevention practices of NPs regarding childhood obesity, (b) compare the practices of NPs by specialty, practice setting, and awareness of childhood obesity prevention guidelines, (c) identify relationships between prevention practices and demographic variables of NPs, and (d) examine the resources for and barriers to implementing prevention practices.

Methods

Sample

A convenience sample of 99 family NPs (FNPs) and PNPs from the Intermountain area was used. The names of potential participants were obtained from the Division of Occupational and Professional Licensing (DOPL) office of a state in the Intermountain West. However, because it was not possible at the time to obtain a list of only PNPs and FNPs, questionnaires were mailed to 607 advanced practice registered nurses (APRNs) in the Intermountain area. Five questionnaires were returned undeliverable, and 288 (48%) completed questionnaires were returned. Of the returned questionnaires, 99 (34%) met the inclusion criteria and were usable.

Procedures

Following approval from the Institutional Review Board, a cover letter, consent form, demographic form, questionnaire, and stamped return addressed envelope were mailed to the homes or offices of 607 licensed APRNs as of December 2003. The APRNs who did not respond within 2 weeks were sent a reminder card to urge participation. An additional 2-week time period was allowed for return of any remaining surveys. Return of the survey indicated consent to participate. Surveys were included in the analysis if they were returned by APRNs who (a) were licensed as an advanced practice NP as of December 2003 and (b) practiced in a primary care family or primary care pediatric setting. APRNs who were not NPs, NPs who did not see children aged 2–20 years, or NPs who worked in pediatric specialty areas (e.g., pediatric cardiology) were excluded from analysis.

Instrument

All participants completed a demographic form and a questionnaire, based on documented risk factors for childhood obesity as well as prevention guidelines developed by the AAP (2003), the Weight Realities Division of the Society for Nutrition Education (2003), Iowa Department of Public Health (2000), and Barlow and Dietz (1998, 2002). Prior to data collection, the questionnaire was reviewed and pilot tested by two FNPs who have experience in pediatrics, and revisions made according to their input.

The survey asked NPs to rate themselves using a Likert-type scale, from 1 to 5, on how often they perform the following: (a) routinely calculate BMI and serial plotting for screening of overweight, (b) routinely counsel parents about proper nutrition practices, physical activity, reducing sedentary behaviors, and parenting skills, (c) routinely take dietary, physical activity, and television/media histories, and (d) specifically identify and target at-risk children (low SES, African Americans, Hispanics, Native Americans, overweight/obese parents). In addition, the survey asked three open-ended questions about resources and barriers NPs encounter in dealing with childhood obesity prevention. Demographic questions included details about the NPs' background and practice experience.

Data analysis

Data were entered into SPSS software. Descriptive statistics were used to describe the demographics of the sample as well as individual item responses of the sample's childhood obesity prevention practices. Differences in response by specialty, practice setting, and awareness of the AAP guidelines were compared using an

independent-samples *t*-test. Bivariate Pearson's correlation coefficient was used to examine the relationship of demographic characteristics to questionnaire responses. The level of significance was set at $p < .05$. To determine the barriers and resources for implementing prevention practices, a content analysis of the open-ended questions was performed by the primary investigator and two faculty experienced in qualitative research. Initially, the open-ended questions were transcribed verbatim, then synthesized, and categorized by the frequency of identified barriers and resources according to appropriate qualitative methods (Denzin & Lincoln, 1994).

Results

NP characteristics

Eighty-two (82.8%) of the participants were women and 17 (17.2%) were men. The mean age was 45 years with the range being 27–66 years. Twenty-three (23.2%) were PNPs, and 76 (76.8%) were FNPs. Thirty-nine (39.4%) worked in a pediatric practice setting, and 60 (60.6%) worked in a family practice setting. The majority, 39 (39.8%), worked in an urban area. The mean number of years in practice as an NP for the participants was 10 years with the range being 3 months to 30 years. The majority, 73 (73.7%), reported being aware of guidelines or recommendations for childhood obesity prevention, 26

(26.3%) were not aware of guidelines, 54 (57.6%) reported they followed the AAP recommendations for obesity prevention, and 38 (40.4%) reported they did not use any guidelines at all.

NP prevention strategies

The NPs were asked to rate themselves, using a Likert scale, on how often they performed 12 AAP childhood obesity prevention strategies. Results are shown in Table 1.

Differences by specialty, practice settings, and awareness of prevention guidelines

The AAP childhood obesity prevention recommendations were analyzed by independent-samples *t*-tests to compare (a) prevention practices of PNPs and FNPs, (b) practices of NPs working in a pediatric practice setting to NPs working in a family practice setting, and (c) practices of NPs who were aware of childhood obesity prevention guidelines to those who were unaware of guidelines. Significant differences were found between mean responses of PNPs and FNPs as well as between NPs working in a pediatric practice setting and NPs working in a family practice setting (see Table 2). NPs who reported being aware of childhood obesity prevention guidelines also differed significantly in their responses to NPs who were not aware of the prevention guidelines (see Table 2).

Table 1 Childhood obesity prevention practices of NPs according to the AAP recommendations ($N = 99$)

| Prevention strategy | n (%) | | | | | Mean \pm SD |
|---|-----------|------------|---------------|-----------|------------|----------------|
| | Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) | |
| Calculate BMI once a year | 22 (22.2) | 27 (27.3) | 24 (24.2) | 17 (17.2) | 9 (9.1) | 2.6 \pm 1.3 |
| Use change in BMI to identify rate of excessive weight gain | 35 (35.4) | 22 (22.2) | 26 (26.3) | 11 (11.1) | 5 (5.1) | 2.3 \pm 1.2 |
| Encourage parents to offer nutritious snacks to their children | 0 | 1 (1) | 5 (5.1) | 45 (45.5) | 48 (48.5) | 4.4 \pm 0.6 |
| Encourage parents to model healthy food choices | 0 | 7 (7.1) | 7 (7.1) | 43 (43.4) | 42 (42.4) | 4.2 \pm 0.9 |
| Encourage parents to allow their children to self-regulate food intake | 6 (6.1) | 12 (12.1) | 28 (28.3) | 35 (35.4) | 18 (18.2) | 3.5 \pm 1.1 |
| Encourage parents to promote physical activity with their children | 0 | 1 (1) | 10 (10.1) | 46 (46.5) | 42 (42.4) | 4.3 \pm 0.7 |
| Recommend limiting television/media to 2 h per day | 5 (5.1) | 5 (5.1) | 22 (22.2) | 34 (34.3) | 33 (33.3) | 3.9 \pm 1.1 |
| ^a Monitor children who are of low SES | 19 (19.6) | 38 (39.2) | 19 (19.6) | 13 (13.4) | 8 (8.2) | 2.5 \pm 1.2 |
| ^a Monitor children with overweight/obese parents more than children whose parents are of normal weight | 12 (12.5) | 13 (13.5) | 31 (32.3) | 29 (30.2) | 11 (11.5) | 3.1 \pm 1.2 |
| ^a Monitor African American children more than Caucasian children | 43 (44.8) | 32 (33.3) | 13 (13.5) | 5 (5.2) | 1 (1) | 1.7 \pm 1.0 |
| ^a Monitor Hispanic children more than Caucasian children | 33 (34.4) | 27 (28.1) | 19 (19.8) | 10 (10.4) | 7 (7.3) | 2.3 \pm 1.2 |
| ^a Monitor Native American children more than Caucasian children | 36 (36.4) | 29 (30.2) | 15 (15.6) | 8 (8.3) | 5 (5.2) | 2.04 \pm 1.2 |

^aSome numbers may not equal 99 because not all participants responded to every item.

Table 2 Comparing the practices of NPs by specialty, practice setting, and awareness of childhood obesity prevention guidelines

| Prevention strategy | Difference between PNs and FNPs (t) | Difference between NPs in pediatric practice and NPs in family practice (t) | NPs' awareness of childhood obesity prevention guidelines (t) |
|--|-------------------------------------|---|---|
| Use change in BMI to identify rate of excessive weight gain relative to linear growth | ns | ns | -2.041* |
| Encourage parents to offer children nutritious snacks | 2.958** | 1.991** | ns |
| Encourage parents to model healthy food choices | 4.424** | 2.091* | ns |
| Encourage parents to allow children to self-regulate meal intake | 2.464* | ns | ns |
| Encourage parents to promote physical activity with their children | 2.321* | 2.591** | -2.121* |
| Monitor African American children more than Caucasian children | ns | 2.330* | -2.672** |
| Monitor Native American children more than Caucasian children | ns | 2.753** | -2.012* |
| Monitor Hispanic children more than Caucasian children | ns | ns | -2.312* |
| Monitor children with overweight/obese parents more than children whose parents are of normal weight | ns | ns | -2.510* |
| Aware of guidelines for childhood obesity prevention | 2.841** | 2.116* | |

* $p < 0.05$, ** $p < 0.01$, ns = not significant.

Relationship among number of years in practice and questionnaire responses

Upon completing a Pearson’s correlation coefficient, only one significant correlation was found between the number of years of NP practice and items involving the AAP recommendations (physical activity promotion). NPs with more years of practice were more likely to encourage parents to promote physical activity for their children than NPs with less years of practice ($r = .225, p < .025$).

Barriers and resources for NPs in preventing childhood obesity

The NPs participating in the study were asked to list barriers and resources they experienced in preventing childhood obesity. Overall barrier themes included parent/ family attitudes, the American lifestyle, and lack of resources for both NPs and families (see Figure 1). Figure 2 lists the major themes identified as resources for patients and for NPs in preventing childhood obesity. As indicated, the most common resource for the patient was the dietician and common resources for the NPs were journal articles and Web sites.

Discussion

NP prevention strategies

Using BMI

The CDC (2004) outlines at least four advantages to using BMI for age: (a) can be used for adolescents, (b) is

consistent with the adult BMI index and can therefore be used to monitor body size for anyone of age 2 years or older, (c) can be correlated with clinical risk factors for cardiovascular disease, and (d) performs equally well as

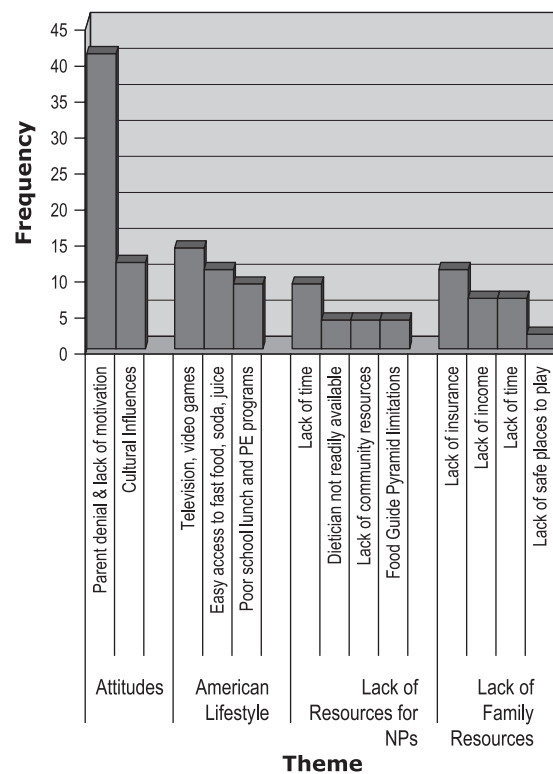


Figure 1 Barriers NPs faced in preventing childhood obesity.

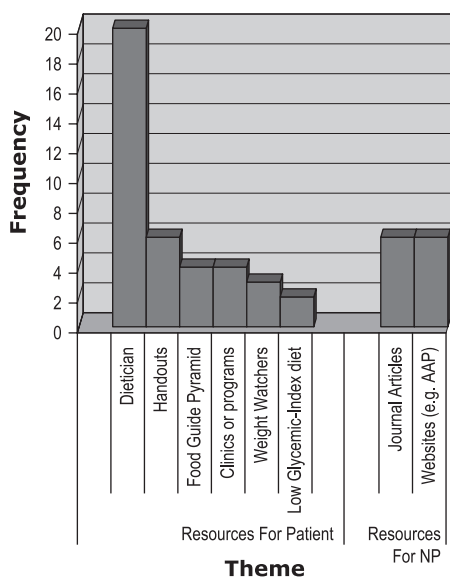


Figure 2 Resources NPs used in preventing childhood obesity.

weight for stature for preschool-aged children and slightly better for school-aged children. BMI for age may also be a better measure for assessing overweight than weight for stature because the weight-for-stature chart is limited to prepubescent boys under age 11.5 years and prepubescent girls under age 10 years. In addition, the BMI index used in children accounts for the child's age, whereas the weight-for-height index does not.

Findings show that although the majority of the NPs in this study reported being aware of childhood obesity prevention guidelines (73.7%), more than half never or rarely calculated BMI once a year or used change in BMI to identify the rate of excessive weight gain. This is alarming because the AAP (2003) and CDC (2004) currently recommend BMI for age be calculated once a year for all children and adolescents aged 2–20 years. It is not known if other pediatric HCPs are using BMI for age more consistently than the NPs in this study because no studies have reported this information.

However, some NPs in this study may be using the weight-for-stature chart, which is approved but not recommended by the AAP or CDC. The first recommendations by expert committees for using BMI for age in place of the weight-for-stature chart came out in 1994 and again in 1997, and the CDC growth charts were revised in 2000 (CDC, 2004). Perhaps, pediatric HCPs are still using the weight-for-stature chart while transitioning to the use of the BMI-for-age chart, although the recommendation was made almost 10 years ago. However, it is important to note that the weight-for-stature chart performs as well as BMI for age in preschool-aged children and is acceptable for use in this age group (CDC; Mei et al., 2002).

One study participant mentioned disliking BMI because it does not factor in nutrition or lifestyle. It is also just a measure of weight and height and does not directly measure body fat. However, the CDC Growth Chart Training Modules (CDC, 2004) and expert committee recommendations (Barlow & Dietz, 1998, 2002) clearly emphasize that BMI is a screening tool, not a diagnostic tool, and should be used in conjunction with a complete assessment of the patient and other measures (e.g., skinfold thickness) to determine risk of overweight or obesity.

Promoting appropriate nutrition, physical activity, and parenting practices

In addition to BMI, the AAP (2003) mandates pediatric HCPs give proper patient education regarding nutrition, physical activity, and parenting practices. Results of this study show that most NPs always or often discussed proper nutrition and physical activity for children with parents. Thirty-eight percent of the NPs in this study also sometimes offered education about appropriate parenting practices, and 32% reported being rarely afraid of offending parents when discussing childhood obesity risk factors and complications. These findings demonstrate that most NPs responding to the survey were indeed teaching patients as advised by the AAP.

Monitoring children at risk

As mentioned previously, children who are of low SES, children whose parents are overweight, African American children, Hispanic children, and Native American children are at greater risk for childhood obesity than Caucasian children or those of higher SES (AAP, 2003; CDC, 2003a; Moran, 1999; Polhamus et al., 2003; Rocchini, 2002; Strauss, 2002). Therefore, the AAP recommends closely tracking children at risk for childhood obesity. However, most NPs in this study rarely monitored children of lower SES, sometimes monitored children with overweight parents, and never monitored African American, Hispanic, or Native American children more than Caucasian children. Three reasons may account for these findings. First, the organization of the questionnaire may have been confusing to the participants. Some participants mentioned they monitor all patients with the same degree of scrutiny rather than a particular ethnic group. It might have been better to ask if NPs were aware of these risk factors rather than ask if they monitor children from certain ethnic groups more than those from other ethnic groups. A second explanation may be that the state where data were gathered is largely Caucasian (89.2%) with only 9% being Hispanic, 1.3% Native American, and 0.8% African American (Governor's Office of Planning and Budget Demographic and Economic Analysis, 2002). In

addition, some participants stated they did not have any African American or Native American patients. Third, the NPs may not know certain ethnic groups and low SES are risk factors for childhood obesity, and therefore did not monitor children from these ethnic groups and SES.

Differences by specialty, practice setting, and awareness of prevention guidelines

In this study, PNPs were more likely than FNPs to encourage parents to offer nutritious snacks to their children, model healthy food choices, allow their children to self-regulate meal intake, and promote physical activity in their children. This finding is not unexpected because PNP programs offer more specific classes and information on children's health than do FNP programs (The National Organization of Nurse Practitioner Faculties, 2002). NPs in this study who worked in a pediatric practice setting were also more likely to encourage parents to offer nutritious snacks to their children, model healthy food choices, and promote physical activity in their children than NPs working in a family practice setting. In addition, they were also more likely to monitor African American and Native American children for childhood obesity. The NPs in this study who reported being aware of guidelines for childhood obesity prevention were more likely than those who were unaware of guidelines to use change in BMI to identify rate of excessive weight gain relative to linear growth, encourage parents to promote physical activity in their children, and monitor children who are at risk for childhood obesity because of ethnicity or family history. Finally, PNPs and NPs working in a pediatric practice setting were more likely to be aware of childhood obesity prevention guidelines than FNPs and NPs working in a family practice setting.

Barriers and resources for NPs in preventing childhood obesity

Barriers encountered

Major categories for barriers the NPs faced in implementing childhood obesity prevention strategies included (a) attitudes, (b) the American lifestyle, (c) lack of practice resources, and (d) lack of family resources. The NPs also reported that parental attitudes were one of the biggest deterrents because parents were often described as poor examples for their children regarding physical activity and nutrition habits and lacking knowledge about general nutrition balance. NPs also reported that parents did not seem motivated to make appropriate family lifestyle changes. This is consistent with Story et al. (2002), who found lack of parent involvement a common barrier to preventing or managing childhood obesity.

Culture was also described as influencing family attitudes about childhood obesity prevention. Although the participants often did not identify the cultures they were referring to, it is plausible to apply this response to many cultures. American lifestyle, however, was listed as a barrier as was being Native American or Hispanic. The NPs also stated that many parents believe a chubby child is healthy while a thin child is sick. This finding supports Contento et al. (2003) who found that Latina women in New York City perceived children at the 50th–75th percentile for BMI for age to be too thin and unhealthy. Similarly, Baughcum, Burklow, Deeks, Powers, and Whitaker (1998) interviewed a group of low-income mothers enrolled in the Women, Infants and Children program and found that these women believed a heavy infant is a healthy infant and an indicator of successful parenting.

The NPs did express frustration with the American lifestyle and felt it was difficult for families to overcome the social norms of television, video games, soft drinks, and fast-food restaurants. They specifically mentioned a disappointment in the schools, where vending machines contain "junk food," lunches are high in fat and carbohydrates, and curricula lack physical education classes. These findings are not surprising in light of recent literature, which has reported similar problems (AAP, 2003; Berkey et al., 2000; St-Onge et al., 2003).

Consistent with Story et al.'s (2002) study, lack of time and lack of reimbursement were other common barriers mentioned by the NPs. The NPs described not having enough time to adequately counsel and educate patients regarding childhood obesity because of busy practices. Although the majority of them (75.8%) reported having a dietician available in their offices, some stated insurance companies did not cover dieticians or visits for obesity. In addition, the NPs reported lack of community resources, programs, or professionals to refer patients to, which was similar to Story et al.'s findings.

A few of the NPs mentioned disliking the USDA Food Guide Pyramid (FGP), stating its current recommendations often lead to overeating because the number of servings suggested do not always correspond to actual portions or serving sizes Americans eat. In other words, a person may eat 6–11 servings of grains per day as suggested, but those servings are much larger than the recommended or intended serving size. The NPs also stated that the current FGP is too high in carbohydrates. On the other hand, the FGP was also listed as a resource for patient education, and even given its limitations, the expert committees still recommend its use (Barlow & Dietz, 2002). The FGP is currently being revised, and the updated version will be available in 2005 (USDA Center for Nutrition and Policy Promotion, 2004). It would be useful if the new FGP will address serving size.

The final barriers mentioned related to lack of family resources. As previously discussed, insurance companies often do not cover childhood obesity services. In addition, some families may not have insurance. Both of these situations prevent adequate follow-up for children at risk for obesity. Lack of income was another key barrier related to family resources, which prevented families from affording a dietician consult or other program even if they did have some insurance. A third barrier was that NPs found families, especially those with two working parents, were often too busy to prepare healthy meals and would turn to fast or processed food because of its convenience. This finding is consistent with St-Onge et al. (2003) who also mention that parents' time limitations prevent healthier food choices and that the food industry has increased the convenience of fast and processed foods in response to these time constraints. Additionally, the NPs mentioned that it was not uncommon for low-income families to live in areas where children were not safe to go outside to play, thereby decreasing their activity level. These findings are not unexpected because other studies have demonstrated an association between low SES, decreased physical activity, and healthy eating habits (AAP, 2003; O'Loughlin, Gray-Donald, Paradis, & Meshefedjian, 2000).

Resources used

Interestingly, a few of the barriers were also listed as resources. For example, a dietician was the most frequently reported resource, followed by clinics or programs, such as Weight Watchers, and the FGP. However, these resources may not be practical for families because of cost. NPs also reported using handouts or pamphlets to reinforce patient teaching and supplementing their own knowledge of childhood obesity prevention with journal articles and Internet sources.

Implications for practice

Study findings helped identify areas of improvement for NP prevention practices related to childhood obesity. First, NPs should more consistently use BMI for age to screen for children who are overweight or at risk of being overweight because it is the measure widely used to define overweight (AAP, 2003; CDC, 2004). In order to make screening a regular part of well-child exams, NPs should be trained to accurately measure BMI for age, and the CDC Web site has training modules available for help in calculating BMI for age. Because the AAP is the recognized authority for care of pediatric patients and makes recommendations based on the best information available, NPs should adhere to its guidelines in order to maintain an acceptable standard of pediatric care and reduce practice variations among clinicians. However, recommendations

or guidelines should not replace an NP's clinical experience and judgment but rather be used in conjunction with them. This is especially true when using BMI-for-age screening.

Second, NPs may need to receive more education on risk factors for childhood obesity, such as ethnicity and low SES, because children from these groups are at risk. In addition, because FNPs in this study were less likely than PNs to perform several prevention strategies, FNPs who see children on a regular basis should consider obtaining additional education on childhood obesity. It is imperative for NPs to remain up to date on current literature so that they can better manage and prevent childhood obesity. While NPs in this study reported lack of resources as a barrier, the recent public focus on childhood obesity has increased access to many resources through the Internet. Web sites, such as www.aap.org, provide links to several childhood obesity resources, including practitioner education and family resources. A list of additional resources available on the Internet can be found in Table 3.

A third recommendation is that NPs be proactive in advocating childhood obesity prevention programs in their communities. Because schools and insurance coverage were identified as barriers, schools and insurance companies should be the target for advocacy. NPs can assist schools in implementing programs that promote physical activity and nutrition. They can encourage insurance companies to provide reimbursement for childhood obesity prevention strategies. The National Institute for Health Care Management (2003) has distributed a paper entitled *Childhood Obesity—Advancing Effective Prevention and Treatment: An Overview for Health Professionals*, which provides an overview and contact information for a large number of school and community programs in the United States. This paper can be downloaded at www.nihcm.org.

Limitations

This study had several limitations. First, it only queried FNPs and PNs practicing in one state in the Intermountain

Table 3 Childhood obesity Internet resources

| Organization | Web site |
|--|--|
| AAP | www.aap.org/obesity |
| American Dietetic Association | www.eatright.org |
| American Obesity Association | www.obesity.org/subs/childhood |
| BAM! Body and Mind | www.bam.gov |
| CDC | www.cdc.gov |
| National Institute for Health Care Management | www.nihcm.org |
| National Association of Pediatric Nurse Practitioners | www.napnap.org |
| Shape Up America | www.shapeup.org |
| Shaping America's Youth | www.shapingamericasyouth.com |

area. Second, the DOPL was unable to differentiate between types of APRNs according to specialty. Thus, the response rate for PNs and FNPs working in family and pediatric practice settings could not be accurately determined. Third, operational definitions were not outlined for the Likert-scale options. As a result, consistency of NP practice strategies could not be described more specifically because individuals may interpret the choices (never, rarely, sometimes, often, or always) differently. The fourth limitation might be the social desirability factor. Therefore, survey responses might not reflect actual practice behaviors but rather what respondents think they should do.

Research recommendations

Areas for future research are recommended. First, if this study is replicated, information should be obtained from FNPs and PNs living across the country. Second, it would be interesting to compare NPs working in pediatric and family practice settings to physicians working in pediatric and family practice settings regarding childhood obesity prevention practices. Only items related to the AAP childhood obesity prevention recommendations were analyzed in this study. Therefore, a third recommendation is to complete additional analyses for the items associated with other childhood obesity prevention guidelines.

Conclusion

Although NPs are not consistently using BMI for age to screen for childhood obesity, they are teaching parents how to promote proper nutrition and physical activity habits in their families. Because childhood obesity is escalating at such a rapid rate, it is critical that NPs take the necessary steps to help curtail the problem and those NPs integrating prevention guidelines into their practice may be helping alleviate the problem. In addition to proper health supervision of children, NPs also need to be advocates in their communities to help overcome the barriers to childhood obesity prevention.

References

- American Academy of Pediatrics (AAP). (2003). Prevention of pediatric overweight and obesity. *Pediatrics*, *112*(2), 424–430. Retrieved April 27, 2004, from <http://www.aap.org/obesity/>
- Barlow, S. E., & Dietz, W. H. (1998). Obesity evaluation and treatment: Expert committee recommendations. *Pediatrics*, *102*(3), e29. Retrieved October 20, 2003, from <http://pediatrics.aappublications.org/cgi/reprint/102/3/e29.pdf>
- Barlow, S. E., & Dietz, W. H. (2002). Management of child and adolescent obesity: Summary and recommendations based on reports from pediatricians, pediatric nurse practitioners, and registered dietitians. *Pediatrics*, *110*(1), 236–238.
- Barlow, S. E., Dietz, W. H., Klish, W. J., & Trowbridge, F. L. (2002). Medical evaluation of overweight children and adolescents: Reports from pediatricians, pediatric nurse practitioners, and registered dietitians. *Pediatrics*, *110*(1), 222–228.
- Barlow, S. E., Trowbridge, F. L., Klish, W. J., & Dietz, W. H. (2002). Treatment of child and adolescent obesity: Reports from pediatricians, pediatric nurse practitioners, and registered dietitians. *Pediatrics*, *110*(1), 229–235.
- Baughcum, A. E., Burklow, K. A., Deeks, C. M., Powers, S. W., & Whitaker, R. C. (1998). Maternal feeding practices and childhood obesity. *Archives of Pediatric & Adolescent Medicine*, *152*, 1010–1014.
- Baughcum, A. E., Chamberlin, L. A., Deeks, C. M., Powers, S. W., & Whitaker, R. C. (2000). Maternal perceptions of overweight preschool children. *Pediatrics*, *106*(6), 1380–1386.
- Baughcum, A. E., Powers, S. W., Johnson, S. B., Chamberlin, L. A., Deeks, C. M., Jain, A., et al. (2001). Maternal feeding practices and beliefs and their relationships to overweight in early childhood. *Journal of Developmental and Behavioral Pediatrics*, *22*(6), 391–408.
- Berkey, C. S., Rockett, H. R. H., Field, A. E., Gillman, M. W., Frazier, A. L., Camargo, C. A., Jr., et al. (2000). Activity, dietary intake, and weight changes in a longitudinal study of preadolescent and adolescent boys and girls. *Pediatrics*, *105*(4), e56. Retrieved June 5, 2003, from <http://www.pediatrics.org/cgi/content/full/105/4/e56>
- Centers for Disease Control and Prevention (CDC). (2003a). *National Center for Health Statistics (NCHS). Prevalence of overweight among children and adolescents: United States, 1999–2000*. Retrieved May 8, 2004, from <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overwght99.htm>
- Centers for Disease Control and Prevention (CDC). (2003b). *National Health and Nutrition Examination Survey (NHANES). Overweight among U.S. children and adolescents*. Retrieved May 8, 2004, from <http://www.cdc.gov/nchs/data/nhanes/databriefs/overwght.pdf>
- Centers for Disease Control and Prevention (CDC). (2004). *Using the BMI-for-age growth charts*. Retrieved April 22, 2004, from <http://www.cdc.gov/nccdphp/dnpa/growthcharts/training/modules/module1/text/page1a.htm>
- Contento, I. R., Basch, C., & Zybert, P. (2003). Body image, weight, and food choices of Latina women and their young children. *Journal of Nutrition Education and Behavior*, *35*, 236–248.
- Crespo, C. J., Smit, E., Troiano, R. P., Bartlett, S. J., Macera, C. A., & Andersen, R. E. (2001). Television watching, energy intake, and obesity in U.S. children. *Archives of Pediatric & Adolescent Medicine*, *155*, 360–365.
- Danielzik, S., Langnase, K., Mast, M., Spethmann, C., & Muller, M. J. (2002). Impact of parental BMI on the manifestation of

- overweight 5–7 year old children. *European Journal of Nutrition*, **41**, 132–138.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.
- Epstein, L. H., Paluch, R. A., Consalvi, A., Riordan, K., & Scholl, T. (2001). Effects of manipulating sedentary behavior on physical activity and food intake. *The Journal of Pediatrics*, **140**(3), 334–339.
- Faith, M. S., Berman, N., Heo, M., Pietrobelli, A., Gallagher, D., Epstein, L. H., et al. (2001). Effects of contingent television on physical activity and television viewing in obese children. *Pediatrics*, **107**(5), 1043–1048.
- Golan, M., & Weizman, A. (2001). Familial approach to the treatment of childhood obesity: Conceptual model. *Journal of Nutrition Education*, **33**(2), 102–107.
- Goldfield, G. S., Epstein, L. H., Kilanowski, C. K., Paluch, R. A., & Kogut-Bossler, B. (2001). Cost-effectiveness of group and mixed family-based treatment for childhood obesity. *International Journal of Obesity*, **25**, 1843–1849.
- Governor's Office of Planning and Budget Demographic and Economic Analysis. (2002). *Census brief: Race and ethnicity in Utah. Third in a series of census 2000 analyses*. Retrieved April 23, 2003, from <http://governor.utah.gov/dea/Minorities.PDF>
- Iowa Department of Public Health. (2000). *Prevention of child and adolescent obesity in Iowa: Iowa position paper*. Retrieved October 6, 2003, from <http://www.idph.state.ia.us/common/pdf/wic/obesity.pdf>
- Jain, A., Sherman, S. N., Chamberlain, L. A., Carter, Y., Powers, S. W., & Whitaker, R. C. (2001). Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics*, **107**(5), 1138–1146.
- Maffei, C. (2000). Aetiology of overweight and obesity in children and adolescents. *European Journal of Pediatrics*, **159**(Suppl. 1), S35–S44.
- Maffei, C., Talamini, G., & Tato, L. (1998). Influence of diet, physical activity and parents' obesity on children's adiposity: A four-year longitudinal study. *International Journal of Obesity*, **22**, 758–764.
- Mei, Z., Grummer-Strawn, L. M., Pietrobelli, A., Goulding, A., Goran, M. I., & Dietz, W. H. (2002). Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *American Journal of Clinical Nutrition*, **75**, 978–985.
- Moran, R. (1999). Evaluation and treatment of childhood obesity. *American Family Physician*, **59**(4). Retrieved June 13, 2002, from <http://www.aafp.org/afp/990215ap/861.html>
- National Institute for Health Care Management. (2003). *Childhood obesity—Advancing effective prevention and treatment: An overview for health professionals*. Retrieved August 10, 2005, from www.nihcm.org/ChildObesityOverview.pdf
- O'Loughlin, J., Gray-Donald, K., Paradis, G., & Meshefedjian, G. (2000). One- and two-year predictors of excess weight gain among elementary schoolchildren in multiethnic, low-income, inner-city neighborhoods. *American Journal of Epidemiology*, **152**(8), 739–746.
- Polhamus, B., Dalenius, K., Thompson, D., Scanlon, K., Borland, E., Smith, B., et al. (2003). *Pediatric Nutrition Surveillance 2001 Report*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved October 30, 2003, from http://www.cdc.gov/nccdphp/dnpa/pdf/2001_ped_nutrition_report.pdf
- Roberts, S. O. (2000). The role of physical activity in the prevention and treatment of childhood obesity. *Pediatric Nursing*, **26**(1), 33–39.
- Rocchini, A. P. (2002). Childhood obesity and a diabetes epidemic. *The New England Journal of Medicine*, **346**(11), 854–855.
- Spruijt-Metz, D., Lindquist, C. H., Birch, L. L., Fisher, J. O., & Goran, M. I. (2002). Relation between mothers' child-feeding practices and children's adiposity. *American Journal of Clinical Nutrition*, **75**, 581–586.
- Stephens, M. (2002). Children, physical activity, and public health: Another call to action. *American Family Physician*, **65**(6), 1033–1034.
- St-Onge, M., Keller, K. L., & Heymsfield, S. B. (2003). Changes in childhood food consumption patterns: A cause for concern in light of increasing body weights. *American Journal of Clinical Nutrition*, **78**, 1068–1073.
- Story, M. T., Neumark-Stzainer, D. R., Sherwood, N. E., Holt, K., Sofka, D., Trowbridge, F. L., et al. (2002). Management of child and adolescent obesity: Attitudes, barriers, skills, and training needs among health care professionals. *Pediatrics*, **110**(1), 210–214.
- Strauss, R. S. (2002). Childhood obesity. *Pediatric Clinics of North America*, **49**(1), 175–201.
- Strauss, R. S., & Knight, J. (1999). Influence of the home environment on the development of obesity in children. *Pediatrics*, **103**(6), 1–8. Retrieved June 11, 2003, from <http://www.pediatrics.org/cgi/content/full/103/6/e85>
- Styne, D. M. (2001). Childhood and adolescent obesity: Prevalence and significance. *Pediatric Clinics of North America*, **48**(4), 823–854.
- The National Organization of Nurse Practitioner Faculties. (2002). *Nurse practitioner primary care competencies in specialty areas: Adult, family, gerontological, pediatric, and women's health*. Retrieved August 8, 2005, from <http://www.nonpf.com/>
- USDA Center for Nutrition and Policy Promotion. (2004). *The food guide pyramid update*. Retrieved April 26, 2004, from <http://www.cnpp.usda.gov/pyramid-update/index.html>
- Wang, Y. (2001). Cross-national comparison of childhood obesity: The epidemic and the relationship between obesity and socioeconomic status. *International Journal of Epidemiology*, **30**, 1129–1136.
- Wardle, J., Guthrie, C., Sanderson, S., Birch, L., & Plomin, R. (2001). Food and activity preferences in children of lean and obese parents. *International Journal of Obesity*, **25**, 971–977.
- Weight Realities Division of the Society for Nutrition Education. (2003). *Guidelines for childhood obesity prevention programs: Promoting healthy weight in children*. *Healthy Weight Journal*, July/August, **17**(4), 60–63.