

Treatment of Child and Adolescent Obesity: Reports From Pediatricians, Pediatric Nurse Practitioners, and Registered Dietitians

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ABSTRACT. *Objective.* The primary aim of this study was to identify interventions used by pediatric health care providers in treatment of overweight children and adolescents to identify provider educational needs. A secondary aim was to examine the association of certain provider characteristics with recommended evaluation practices.

Study Design. A random sample of pediatricians, pediatric nurse practitioners, and registered dietitians (RDs) received questionnaires about their diet, activity, and medication recommendations for overweight patients and about referrals to specialists and programs. Results were examined for adherence to published recommendations and for associations with certain respondent characteristics.

Results. A total of 940 providers responded (response rate: 19%–33%). The majority recommended “changes in eating patterns” and “limitations of specific foods.” Half or more used “low-fat diet” and “modest calorie restriction” in adolescents. Less than 15% used “very low-calorie diet.” Fewer RDs recommended more restrictive diets. More than 60% of all groups followed recommended eating interventions for school-aged children and adolescents. More than 80% followed recommended physical activity interventions for all age groups. In each group, about 5% sometimes recommended prescription medication and herbal remedies for adolescents. None recommended surgery. Two thirds of pediatricians and pediatric nurse practitioners often referred to RDs. Approximately 20% referred to child/adolescent weight programs, but for 27% to 42%, these programs or pediatric obesity specialists were not available. No consistent associations between respondent characteristics and adherence to recommended interventions were identified.

Conclusions. The providers generally promoted healthy eating and activity with minimal use of highly restrictive diets or medication to control weight. *Pediatrics* 2002;110:229–235; *child obesity, adolescent obesity, obesity treatment.*

ABBREVIATIONS. MCHB, Maternal and Child Health Bureau; HRSA, Health Resources and Services Administration; DHHS, Department of Health and Human Services; PNP, pediatric nurse practitioner; RD, registered dietitian; BMI, body mass index.

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Like adult obesity, childhood obesity prevalence is rising¹ As these children age, the obesity epidemic will lead to epidemics of diabetes, hypertension, and cardiovascular disease. Adults who want to lose weight can choose from many pharmaceutical and over-the-counter weight loss products and programs, but substantial, sustained weight loss is rare. However, studies in obese children suggest that interventions focused on improved eating and activity behavior may lead to marked, sustained weight loss, with long-term outcomes superior to adult studies.² Intervention in childhood may be particularly effective to prevent obesity, control additional weight gain, and reduce excess weight when already present.

Environmental change rather than genetic change must explain the dramatic increase in obesity prevalence during the past 2 decades. Community action, at national or local levels, can help promote healthier physical activity and eating habits. Health care visits, during which providers can identify, evaluate, and treat obesity, offer more individualized opportunities to prevent and manage obesity in children and adolescents.

To assist providers who care for obese children and adolescents, the Maternal and Child Health Bureau (MCHB), Health Resources and Services Administration (HRSA), Department of Health and Human Services (DHHS), Rockville, Maryland, sponsored an assessment of pediatric providers to determine attitudes and barriers to care of obese children and to identify obesity evaluation and intervention practices. This article focuses on the reports of intervention strategies used by health professionals to care for overweight children and adolescents. A national sample of pediatricians, pediatric nurse practitioners (PNPs), and registered dietitians (RDs) answered questions about specific eating and activity interventions they use when they treat obese children and adolescents. They also reported use of medication and surgery, and frequency of referrals to other medical specialists or centers and to commercial weight loss programs or camps. This study's primary aim was to characterize the usual interventions of pediatric professionals who see overweight youth. Additional aims were to compare interventions reported by providers to those recommended by an Expert Committee and to explore associations between reported interventions and type of practice and personal demographics.

METHODS

The methods used to develop and administer the entire assessment are outlined in detail in the article by Trowbridge et al.³ Random samples of members of the American Academy of Pediatrics ($n = 1088$), the National Association of Pediatric Nurse Associates and Practitioners ($n = 879$), and the American Dietetic Association ($n = 1652$) received the assessment December 1998 through March 1999. Sampled professionals received the mailed assessment and then a reminder postcard. Nonresponders received a second copy of the assessment. Pediatricians who did not respond then received a telephone call to encourage participation and allow completion by telephone.

The questions related to interventions addressed use of particular diet modifications such as "limitation of specific foods" and "low-fat diet," specific activity modifications such as "increase in organized activity" and "decrease in sedentary behavior," and use of medication or surgery in the treatment of obese children and adolescents. The respondents used a 3-level Likert scale ("often," "sometimes," and "never") to report their use of these interventions for 3 age categories: preschool, school-aged, and adolescent. The questionnaire also asked about availability of specialists and weight loss programs and frequency of referrals to these specialists and programs. Response options to these questions were "most of the time" "often," "sometimes," "rarely," "never," and "not available."

The assessment also contained questions about the number of years the providers had been in practice, the focus of their clinical practice (general care or a specialty such as adolescent medicine or cardiology), and their gender, weight, and height. Self-reported weight and height were used to calculate body mass index (BMI).

Definitions of Recommended Treatment Practices

The authors identified recommended treatment practices for eating interventions and for physical activity interventions. The primary source for the recommendations was the recommendations of an Expert Committee convened in March 1997 by the MCHB, HRSA, DHHS.⁴ The Expert Committee based their recommendations on studies of behavioral programs for weight loss in children, especially the work of Epstein et al^{5,6} and, when published evidence was not available, their own experience. The recommended eating and activity treatments for preschool, school-aged, and adolescent youth are shown in Tables 1 and 2. These recommendations did not define a single approach for changes in eating and activity behavior for all overweight children. By accepting "sometimes" as a response to questions about common eating and activity interventions, the recommendations accommodated the differences in baseline behaviors, interests, and weights of children treated for obesity that may influence a practitioner's recommendations.

To determine if specific professional and personal characteristics of the respondents were associated with use of recommended treatments, we identified those respondents who followed the recommended eating or activity practices in each age group and compared them with those who did not follow the recommendations. We looked for differences in treatment practices related to type of practice, duration of practice, BMI, and, when sample distribution allowed, gender. Three categories of practice type were defined: general practice, nonobesity-related specialty, and obesity-related specialty. Adolescent medicine, cardiology, developmental/behavioral pediatrics, endocrinology, and pulmonology comprised obesity-related specialties because providers in these specialties are likely to address weight or weight-related

complications regularly in their practice. The 3 categories of duration of practice were <5 years, 5 to 10 years, and >10 years. BMI categories followed the definitions outlined by the World Health Organization⁷: <25 kg/m², 25 to 29.9 kg/m², and >30 kg/m². Within each professional group, χ^2 tests assessed bivariate relationships between each clinician characteristic and adherence to each recommended intervention. Because duration of practice (often a reflection of age), BMI, gender, and specialty can be associated,³ statistically significant bivariate relationships were further tested by multivariate logistic regression that included all clinician variables to eliminate confounders.

RESULTS

A total of 203 (19%) pediatricians, 293 (33%) PNPs, and 444 (27%) RDs completed the assessment. Information about nonresponders is detailed in the article by Trowbridge et al.³

Weight Control Recommendations

When pediatricians and PNPs identified overweight school-aged children and adolescents, 73% to 88% reported that they often made recommendations for weight control. Half of the RDs (52%) reported often recommending weight control measures in overweight school-aged children, and about two thirds (66%) did so in overweight adolescents. For overweight preschool-aged children, half the pediatricians and PNPs and one quarter of the RDs often recommended weight control interventions (Table 3).

Eating Interventions

The responses to the questions about eating interventions are shown in Table 4. For preschool-aged children, a high proportion of respondents in all 3 professional groups often recommended "changes in eating patterns" (57%–63%) and "limitations of specific foods" (64%–84%). A minority often used "modest calorie restriction" (17%–26%) and "low-fat diet" (14%–27%) in this age group, and almost none reported any use of "very low-calorie diet" or "commercial diet." Compared with the pediatricians and PNPs, fewer RDs often used "limitation of specific foods," "low-fat diet," and "modest calorie restriction."

For school-aged children, the majority of respondents in all 3 groups often used "changes in eating patterns" (65%–71%) and "limitations of specific foods" (63%–88%). Less often, these providers used "low-fat diet" (31%–49%) and "modest calorie restriction" (25%–36%). However, they used these interventions more often in school-aged children than in preschool-aged children. Less than 10% reported any use of "very low-calorie diet" in this age group.

TABLE 1. Responses Consistent With Eating Interventions Recommended by an Expert Committee

Eating Interventions	Recommended Responses		
	Preschool-Aged	School-Aged	Adolescent
Change in eating patterns	O or S	O or S	O or S
Limitations of specific foods	O or S	O or S	O or S
Low-fat diet	O or S	O or S	O or S
Modest calorie restriction	O or S	O or S	O or S
Very low-calorie diet	N	S or N	S or N
Commercial diet	N	N	S or N

O indicates often; S, sometimes; N, never.

TABLE 2. Responses Consistent With Physical Activity Interventions Recommended by an Expert Committee

Physical Activity Changes	Recommended Responses		
	Preschool-Aged	School-Aged	Adolescent
Increase in organized activity (eg, sports)	All responses	O or S	O or S
Increase in unstructured physical activity	O or S	O or S	O or S
Increase in routine activity	O or S	O or S	O or S
Decrease in sedentary behavior (eg, television)	O or S	O or S	O or S

O indicates often; S, sometimes; N, never.

TABLE 3. Percentage of Responders Who Made Recommendations for Weight Control Often or Most of the Time

Weight Control Recommendations for Overweight Children and Adolescents	% Pediatricians (<i>n</i> = 184–187)	% PNPs (<i>n</i> = 262–272)	% RDs (<i>n</i> = 353–376)
Preschool-aged	49	48	26
School-aged	82	73	52
Adolescent	88	82	66

Because of missing responses, *N* varied somewhat for each question.

TABLE 4. Percentage of Responders Who Recommended Each Eating Intervention Often and Sometimes

		% Pediatricians (<i>n</i> = 177–186)			% PNPs (<i>n</i> = 261–274)			% RDs (<i>n</i> = 353–394)		
		P	SA	A	P	SA	A	P	SA	A
Changes in eating patterns	O	63	71	74	60	67	65	57	65	65
	S	29	25	21	29	26	24	33	32	31
Limitations of specific foods	O	76	82	87	84	88	87	64	63	68
	S	19	16	11	14	10	11	30	31	28
Low fat diet	O	27	49	80	23	40	70	14	31	54
	S	37	40	17	40	47	28	47	54	40
Modest calorie restriction	O	26	33	68	24	36	62	17	25	48
	S	36	52	29	39	47	32	32	48	44
Very low-calorie diet	O	1	1	4	0	0	0	0	0	0
	S	3	8	8	1	3	3	1	1	5
Commercial diet	O	0	0	2	0	0	0	1	1	0
	S	3	6	25	0	1	9	1	1	9
Recommended interventions*		40	71	86	40	71	80	33	61	82

* Percentage of respondents who adhered to all recommended evaluation responses for this part of the patient encounter, as outlined in Table 1.

P indicates preschool-aged; SA, school-aged; A, adolescent; S, sometimes; O, often. Because of missing responses, *N* varied somewhat for each question.

The RDs were least likely to use limitations of specific foods, low-fat diet, and modest calorie restriction.

When providers treated adolescents, they most often used “changes in eating patterns” (65%–74%) and “limitations of specific foods” (68%–87%), similar to their interventions in preschool- and school-aged children. However, these respondents also often used “low-fat diet” (54%–80%) and “modest calorie restriction” (48%–68%). Fewer RDs than pediatricians and PNPs reported frequent use of most of the interventions, a pattern observed in the 3 age groups. A small minority of each professional group used “very low-calorie diet” often or sometimes: 12% pediatricians, 4% PNPs, and 6% RDs. Twenty-eight percent of pediatricians reported use of “commercial diet” often or sometimes, compared with 9% of PNPs and 10% of RDs.

The questionnaire asked the respondents to specify other eating approaches they used. Approaches

reported by 5 or more respondents among all 3 professional groups included “fruits and vegetables” (*n* = 12; 1.3%), “portion control” (*n* = 8; <1%), “increase water” (*n* = 6; <1%), “fiber” (*n* = 5; <1%) and “learn to determine hunger and fullness levels” (*n* = 5; <1%).

Adherence to Eating Intervention Recommendations and Clinician Characteristics

Forty percent of pediatricians, 40% of PNPs, and 33% of RDs followed all the recommendations for eating interventions recommended by the Expert Committee⁴ and presented in Table 1. Adherence to recommendations for school-aged children was found in 71% of pediatricians, 71% of PNPs, and 61% of RDs. More than 80% of all 3 professional groups adhered to recommendations for adolescents.

Fewer RDs who were in nonobesity-related specialties such as neonatology and hematology/oncology adhered to the recommended eating interven-

tions for preschool-aged ($P = .001$), school-aged ($P = .02$), and adolescent children ($P = .08$) compared with RDs in obesity-related specialties or general care. These differences persisted and were statistically significant when adjusted for duration of practice and BMI. Pediatricians in obesity-related subspecialties were more likely to adhere to eating recommendations for adolescents ($P = .01$) compared with those in nonobesity-related specialties and general care. However, this group was not more likely to follow preschool- and school-aged eating recommendations. Among PNPs, no relationships between eating recommendations and clinician characteristics were observed.

Activity Interventions

The responses to the questions about activity interventions are shown in Table 5. When treating preschool-aged children, all clinician groups were highly likely to use “increase in unstructured physical activity or free play” as well as “decrease in sedentary behavior” as activity interventions in this age group. Only 5% or less never used each of these strategies. An “increase in organized activity” was “often” recommended by >70% of PNPs, compared with 36% of RDs and 42% of pediatricians. “Increase in routine activity” was used often by 57% to 66% of the 3 professional groups.

For school-aged children, >95% of all groups used the 4 strategies at least sometimes. “Decrease in sedentary behavior” and “increase in unstructured physical activity or free play” were used “often” by >80% of practitioners, and 65% to 78% “often” recommended “increase in organized activity.”

The responses for the adolescent activity interventions were very similar to the responses for the school-aged children. Again, all groups used the 4 strategies at least sometimes, and most reported using the 4 strategies often. No notable differences were observed between the 3 professional groups.

Adherence to Activity Interventions and Clinician Characteristics

At least 80% of each professional group adhered to the activity recommendations of the Expert Commit-

tee⁴ for the different age groups, presented in Table 2. Adherence was highest for recommended adolescent interventions (94%–98%). RDs with BMIs <25 were more likely to follow the activity recommendations for school-aged children ($P = .002$). This association persisted when adjusted for duration of practice and type of practice (odds ratio = 9.9; 95% confidence interval = 1.64, 59.8). However, no association was found between RD BMI and activity recommendations for preschool-aged children and adolescents. Among pediatricians, recommended activity intervention for any age level was not associated with BMI, duration of practice, type of practice and gender. Similarly, BMI, duration of practice, and type of practice were not associated with recommended activity intervention among the PNPs.

Medication and Surgical Intervention

The responses to the questions about medication and surgery are shown in Table 6. No respondents reported any use of weight loss surgery. No respondents reported frequent use of prescription medications for weight loss, over-the-counter appetite suppressants, or herbal remedies, but a few respondents (<6%) reported some use of these products. More pediatricians than PNPs and RDs sometimes used these products, and a higher percentage used them for adolescents than for preschool- and school-aged children. Occasional use of herbal remedies was reported more often than prescription or over-the-counter products.

Referrals

RDs were notable as the specialist or program to which providers most often referred overweight children. Seventy percent of pediatricians and 64% of PNPs often referred overweight children to a RD. In contrast, <25% of providers often used any other program or specialist. Table 7 shows percentages for each specialist or program. We found 30% of pediatricians, 22% PNPs, and 23% of RDs frequently referred overweight children to at least 1 of the listed weight loss programs, (“child/adolescent weight loss programs,” “pediatric obesity specialist or pro-

TABLE 5. Percentage of Responders Who Recommended Each Physical Activity Intervention Often and Sometimes

		% Pediatricians (n = 180–188)			% PNPs (n = 265–276)			% RDs (n = 347–401)		
		P	SA	A	P	SA	A	P	SA	A
Increase in organized activity	O	42	78	86	72	72	77	36	65	65
	S	34	20	13	28	28	22	37	34	34
Increased in unstructured physical activity	O	75	82	78	87	91	86	84	90	86
	S	20	18	20	12	9	13	15	10	12
Increase in routine activity	O	57	79	93	66	88	98	64	82	94
	S	27	18	7	25	11	3	27	16	6
Decrease in sedentary behavior	O	77	90	95	90	95	97	81	89	91
	S	18	9	4	9	5	3	17	10	8
Recommended intervention*		81	86	94	90	95	98	90	95	97

* Percentage of respondents who adhered to all recommended evaluation responses for this part of the patient encounter, as outlined in Table 2.

P indicates preschool-aged; SA, school-aged; A, adolescent; O, often; S, sometimes. Because of missing responses, N varied somewhat for each question.

TABLE 6. Percent of Responders Who Recommended Each Medication and Surgery Intervention Sometimes

		% Pediatricians (n = 175–185)			% PNPs (n = 259–274)			% RDs (n = 352–388)		
		P	S	A	P	S	A	P	S	A
Prescription medication for weight loss	S	0	2	5	0	0	4	0	1	4
Over-the-counter appetite suppressants	S	0	1	3	0	0	1	0	0	1
Herbal remedies	S	2	4	6	0	1	6	1	1	4
Weight loss surgery	S	0	0	0	0	0	0	0	0	0

Because of missing responses, *N* varied somewhat for each question.

P indicates preschool-aged; SA, school-aged; A, adolescent; S, sometimes.

TABLE 7. Percentage of Responders Who Referred Overweight Children or Adolescents Most of the Time or Often and Percentage Who Reported No Availability of Programs or Specialists

		% Pediatricians (n = 180–187)	% PNPs (n = 259–269)	% RDs (n = 351–373)
RD/nutritionist	R	70	64	—
	NA	3	3	—
Nurse	R	77	10	3
	NA	13	17	6
Exercise specialist	R	7	8	20
	NA	29	33	18
Child/adolescent weight program (eg, Shapedown, Body Shop)	R	25	16	21
	NA	27	29	29
Pediatric obesity specialist or program	R	12	9	12
	NA	35	39	42
Commercial adult weight loss program	R	7	6	3
	NA	8	7	6
Camps for overweight child/adolescent	R	4	4	7
	NA	22	27	18
Pediatric subspecialist (eg, endocrinologist, pulmonologist)	R	10	8	10
	NA	5	5	20
Self-help programs (eg, Overeaters Anonymous)	R	6	4	2
	NA	16	12	7

Because of missing responses, *N* varied somewhat for each question. R indicates referred; NA, program or specialist not available; —, not applicable.

gram,” “commercial adult weight loss program,” and “camps for overweight children.”)

For many of the providers who responded to the assessment, specialist and special programs were not available (Table 7). Over one third lacked access to a pediatric obesity specialist or program, and 27% to 29% lacked access to a child or adolescent weight loss group program, such as Shapedown. Approximately 30% of pediatricians and PNPs had no exercise specialist available, although <20% of RDs reported that deficiency. More than 95% of pediatricians and PNPs had access to pediatric subspecialists compared with about 80% of RDs. All 3 groups reported availability of commercial adult weight loss programs.

DISCUSSION

More than 1 in 5 children now are overweight or at risk for obesity.⁸ Most pediatric providers therefore provide care to such children every day. Encounters with overweight patients are opportunities for assessment and intervention. However, many barriers exist.⁹ The foundation for obesity treatment remains modification of activity and eating behaviors. These interventions are challenging because education of patients and families takes time, behavior change is difficult, and the health consequences of obesity are latent for many children. Because of these constraints, addressing obesity in a busy practice is easily deferred. Several recent studies of physician prac-

tices related to obesity management have examined the care of adult patients.^{10–12} However, little information exists on practices of pediatricians, PNPs, and RDs. A recent study of RDs, nurses, pediatricians, and social workers reported that 95% of all the professional groups discussed nutrition and physical activity when they address weight-related issues with adolescents.¹³ The nutrition and activity questions were not detailed because this study’s primary focus was psychological issues related to evaluation and treatment of overweight adolescents. In a 1989 study, a sample of members of the American Academy of Pediatrics reported a high level of concern about childhood obesity. Frequently recommended treatments included decreasing caloric consumption (84%), seeing a RD/nutritionist (78%), Weight Watchers (66%), aerobic exercise (60%), and behavior modification programs (55%). Only 2% frequently recommended television reduction, and <1% frequently used anorectic drugs.¹⁴ The present study demonstrated similar levels of concern, as described in the accompanying article by Story et al,⁹ and similar frequencies of RD referral and vigorous activity prescriptions but a much higher use of sedentary behavior reduction.

This assessment asked for information about the respondents’ intervention practices. Low response rates to the assessment indicated possible sample bias, an issue discussed in the accompanying article

by Trowbridge et al.³ Despite this limitation, the absolute sample sizes were relatively high. Because little work in this area has been done, the information presented here offers a starting point.

Most pediatricians and PNPs reported routinely recommending weight control in overweight children and adolescents. Fewer RDs made recommendations for these age groups, and all 3 groups recommended weight control in preschool-aged children less frequently. In other studies, at least 75% of pediatric health care providers reported addressing weight-related issues with their overweight patients.^{13,14} A similarly high percentage of physicians treating adults reported advising weight control for their moderately obese patients.¹¹ However, studies that used patient reports and semiquantitative assessments of physician encounters indicated that physicians provided weight loss counseling to a minority of the adults in whom they identified obesity.^{10,12} Furthermore, they overlooked the condition in half of their obese patients.¹⁰ Pediatric health care providers may also over-report their counseling practices.

The respondents used a variety of eating interventions. In general, they reported most frequent use of minimally restrictive interventions (limitation of specific foods and changes in eating patterns), with less frequent use of moderately restrictive interventions (modest calorie restriction and low-fat diet), and rare use of highly restrictive regimens (very low-calorie diets and commercial diets). Fewer RDs than pediatricians and PNPs reported frequent use of any of these interventions, but similar percentages of each professional group used interventions at least sometimes. In all professional groups, restrictive dietary interventions were used more frequently in older children and adolescents. The judicious use of calorie restriction or low-fat diets in preschool-aged children requires additional study. The dietary interventions reported were consistent with maintaining a healthy, well-balanced diet, and this approach has been used effectively in weight loss studies in children.¹⁵

A surprisingly high percentage of pediatricians (>25%) sometimes recommended a commercial diet in adolescents. Although this study did not quantify the use, this information suggests that investigation of the frequency, effectiveness, and safety of different commercial diets in this age group is warranted.

Activity interventions were generally broad-based with appropriate focus on both reduction of sedentary behavior and increases in routine and vigorous activity, both effective approaches.^{5,6,16} The success of promoting television reduction to school children (outside a clinical or group setting¹⁶) suggests that families may find this a simple behavior change. The respondents appeared enthusiastic about this strategy, one that providers can address easily.

Just as pediatricians may recommend use of highly restrictive diets, they also reported some use of prescription medications and herbal products. A few studies examined use of fenfluramine in adolescents before it was withdrawn from the market.^{17,18} The reports of orlistat and sibutramine included patients 18 years and older^{19–21} with 1 exception, which in-

cluded 16-year-old patients.²² The literature that accompanies sibutramine approves its use in patients aged 16 and older. Such medications are probably best handled by pediatricians who specialize in childhood obesity. Herbal products cannot be recommended because of the lack of rigorous safety testing and quality control. However, some families may use these medications, and providers need to redirect these families into healthier approaches with demonstrated effectiveness and safety.

Many providers reported that they have no pediatric weight programs or obesity specialists available to them. However, almost all pediatricians and PNPs had RDs available, and a large majority of the respondents frequently referred patients to RDs. This finding suggests that RDs are an important resource for obesity treatment. This group of professionals may have more time than the physicians and nurses⁹ and feel more prepared to assess accurately the degree of overweight. Certainly, they are knowledgeable and skilled at diet evaluation and modification. Strategies to assist them may be especially effective.

Adherence to all recommended eating and activity interventions was generally high across ages, with the exception of eating recommendations for preschool-aged children. For this age group, <50% of each of the professional groups followed the recommended practices. Many respondents reported never using modest calorie restriction and low-fat diet in this age group, in contrast to the recommended practice. Although young obese children are more likely to outgrow overweight than older children,²³ use of modestly restrictive interventions is sometimes appropriate, especially when degree of excess weight is high and parents are obese. Gender, BMI, number of years in practice, and type of practice were not consistently associated with the likelihood of adherence to recommended interventions. Few providers used medication to treat obese children or adolescents.

Most of the professionals who completed the assessment understood the goals of healthy eating and activity habits and addressed these goals with their overweight patients. These observations suggest that pediatric providers do not need more information about *what* to advise their overweight patients. However, they could benefit from guidance on *how* to advise families. Low patient motivation, a problem reported by many respondents,⁹ as well as practical and emotional obstacles to eating and activity change hinder behavior change in families. Providers could learn effective ways to improve eating and activity as well as the best methods to “prescribe” and reinforce these interventions. Although all 3 professional groups reported a lack of proficiency in counseling skills, they also were interested in additional training.⁽⁹⁾ Continuing medical education programs, a format preferred by most of the respondents,⁹ could present strategies to teach parenting skills and improve motivation. With additional training in counseling skills, RDs may be especially well-positioned to address overweight in children because a smaller percentage reported lack of time as a barrier⁹ and because they are widely available and frequently consulted by pediatricians and PNPs.

Limitations

Several limitations of this study must be considered. The respondents may have inaccurately reported their behavior. They may not recommend eating and activity changes as often as they report, and they may not always recognize overweight in their patients. Regular use of BMI percentile growth charts will ensure identification of overweight children. Professional organizations and health agencies can publicize the gravity of this epidemic and remind providers to address the problem with patients. Other parts of this assessment identified barriers to effective treatment that may undermine the providers' good intentions, including lack of time and lack of reimbursement.⁹ Future work should seek efficient counseling practices, "triage" methods to distinguish families who need comprehensive assistance from those who need brief guidance, and improved reimbursement. Promotion of recommended eating and activity interventions should continue, however, to educate both newly trained providers and established providers who are unfamiliar with these interventions. Because of possible sample bias, the proportion of providers nationally who follow recommendations may be lower than observed in this sample.

CONCLUSION

This assessment demonstrates that pediatric providers generally promote healthy, sustainable eating and activity habits with minimal use of highly restrictive diets or medication to control weight. The quality of counseling by providers who treat overweight children may be improved by greater access to and use of current dietary and physical activity guidelines and patient education materials. However, providers in this study more frequently expressed a need for guidance in motivating patients and families. Therefore, future studies in obesity treatment should seek to identify strategies that motivate families to make and maintain recommended behavioral changes.

REFERENCES

1. Troiano RP, Flegal KM. Overweight children and adolescents: Description, epidemiology, and demographics. *Pediatrics*. 1998;101(suppl):497-504
2. Epstein LH, Valoski A, Wing RR, McCurley J. Ten-year outcomes of behavioral family-based treatment for childhood obesity. *Health Psychol*. 1994;13:373-383
3. Trowbridge FL, Sofka D, Holt K, Barlow SE. Management of child and adolescent obesity: study design and practitioner characteristics. *Pediatrics*. 2002;110:205-209
4. Barlow SE, Dietz WH. Obesity evaluation and treatment: Expert Committee recommendations. *Pediatrics*. 1998;102(3). Available at: <http://www.pediatrics.org/cgi/content/full/102/3/e29>
5. Epstein LH, Wing RR, Koeske R, Ossip DJ, Beck S. A comparison of lifestyle change and programmed aerobic exercise on weight and fitness changes in obese children. *Behav Ther*. 1982;13:651-665
6. Epstein LH, Valoski AM, Vara LS, et al. Effects of decreasing sedentary behavior and increasing activity on weight change in obese children. *Health Psychol*. 1995;14:109-115
7. World Health Organization. *Obesity: Preventing and Managing the Global Epidemic*. Report of a WHO Consultation on Obesity, June 3-5, 1997, Geneva, Switzerland. Geneva, Switzerland: World Health Organization; 1997
8. Troiano RP, Flegal KM, Kuczmarski RJ, Campbell SM, Johnson CL. Overweight prevalence and trends for children and adolescents: the National Health and Nutrition Examination Surveys, 1963 to 1991. *Arch Pediatr Adolesc Med*. 1995;149:1085-1091
9. Story MT, Neumark-Stzainer DR, Sherwood NE, et al. Management of child and adolescent obesity: attitudes, barriers, skills, and training needs among health care professionals. *Pediatrics*. 2002;110:210-214
10. Stafford FS, Farhat JH, Misra B, Schoenfeld DA. National patterns of physician activities related to obesity management. *Arch Fam Med*. 2000;9:631-638
11. Kristeller JL, Hoerr RA. Physician attitudes toward managing obesity: differences among six specialty groups. *Prev Med*. 1997;26:542-549
12. Galuska DA, Will JC, Serdula MK, Ford ES. Are health care professionals advising obese patients to lose weight? *JAMA*. 1999;282:1576-1578
13. Neumark-Stzainer D, Story M, Evans T, Ireland M. Weight-related issues among overweight adolescents: what are health care providers doing? *Top Clin Nutr*. 1999;14:62-68
14. Price JH, Desmond SM, Ruppert ES, Stelzer CM. Pediatricians' perceptions and practices regarding childhood obesity. *Am J Prev Med*. 1989;5:95-103
15. Epstein LH, Wing RR, Koeske R, Valoski A. Effects of diet plus exercise on weight change in parents and children. *J Consult Clin Psychol*. 1984;52:429-37
16. Robinson TN. Reducing children's television viewing to prevent obesity: a randomized controlled trial. *JAMA*. 1999;282:1561-567
17. Bacon GE, Lowrey GH. A clinical trial of fenfluramine in obese children. *Curr Ther Res Clin Exp*. 1967;9:626-630
18. Pedrinola F, Cavaliere H, Lima N, Medeiros-Neto G. Is DL-fenfluramine a potentially helpful drug therapy in overweight adolescent subjects? *Obes Res*. 1994;2:1-4
19. Sjostrom L, Rissanen A, Andersen T, et al. Randomised placebo-controlled trial of orlistat for weight loss and prevention of weight regain in obese patients. *Lancet*. 1998;352:167-172
20. Bray GA, Blackburn GL, Ferguson JM, et al. Sibutramine produces dose-related weight loss. *Obes Res*. 1999;7:189-198
21. Hanotin C, Thomas F, Jones SP, Leutenegger F, Drouin P. Efficacy and tolerability of sibutramine in obese patients: a dose-ranging study. *Int J Obes Relat Metab Disord*. 1998;22:32-38
22. Fanghanel G, Cortinas L, Sanchez-Reyes L, Berber A. A clinical trial of the use of sibutramine for the treatment of patients suffering essential obesity. *Int J Obes Relat Metab Disord*. 2000;24:144-150
23. Whitaker RC, Wright JA, Pepe MS, Seidel KD, Dietz WH. Predicting obesity in young adulthood from childhood and parental obesity. *N Engl J Med*. 1997;337:869-873

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