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## Treating Pediatric Obesity in the Primary Care Setting to Prevent Chronic Disease:

### Perceptions and Knowledge of Providers and Staff

**Mina Silberberg, PhD[Assistant professor],**

Department of Community and Family Medicine, Duke Medicine, Durham, North Carolina

**Lori Carter-Edwards, PhD[Assistant professor],**

Department of Community and Family Medicine, Duke Medicine, Durham, North Carolina

**Gwen Murphy, RD, PhD[Assistant consulting professor],**

Department of Community and Family Medicine, Duke Medicine, Durham, North Carolina

**Meghan Mayhew, MPH[Clinical research coordinator],**

Department of Community and Family Medicine, Duke Medicine, Durham, North Carolina

**Kathryn Kolasa, RD, PhD[Professor],**

Departments of Family Medicine and of Pediatrics, Brody School of Medicine at East Carolina University, Greenville, North Carolina

**Eliana M. Perrin, MD, MPH,**

Department of Pediatrics, Division of General Pediatrics and Adolescent Medicine, University of North Carolina–Chapel Hill, North Carolina

**Sarah Armstrong, MD[Assistant professor],**

Division of Primary Care Pediatrics, Duke University Medical Center

**Cameron Graham, MPH[Obesity program officer], and**

North Carolina Health and Wellness Trust Fund, Raleigh, North Carolina

**Nidu Menon, PhD[Evaluation officer]**

North Carolina Health and Wellness Trust Fund, Raleigh, North Carolina

### Abstract

**BACKGROUND**—The national and international epidemic of chronic disease, including among children, is largely fueled by increasing obesity. It is recommended that primary care play a key role in the treatment of pediatric obesity.

**METHODS**—A written survey was administered to providers and staff at 13 primary care practices across North Carolina, assessing perceptions on multiple dimensions of pediatric obesity treatment and knowledge of dietitian services.

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Address correspondence to Dr. Mina Silberberg, DUMC 104425, Durham, NC 27710 (mina.silberberg@duke.edu).

Current affiliation: Lori Carter-Edwards, deputy director for research and operations, Center for Health Promotion and Disease Prevention, University of North Carolina, Chapel Hill, North Carolina.

Current affiliation: Cameron Graham, executive director, FutureCare of North Carolina, Raleigh, North Carolina.

Current affiliation: Nidu Menon, associate director, Dual Eligibility Planning Group, North Carolina Community Care Networks, Inc., Raleigh, North Carolina.

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**RESULTS**—The response rate for the survey was 66.9% ( $n = 273$ ). Although providers reported feeling comfortable and confident in many areas of childhood obesity, perceived effectiveness was low. Moreover, comfort and confidence were lower for non–primary care providers (PCPs) involved in obesity treatment than for PCPs, and PCP comfort and confidence levels were low for the ability to conduct motivational interviewing and for knowledge of billing for obesity as a diagnosis. Personnel perceived that there were benefits to having a registered dietitian (RD) in their practice and generally understood RD capacity. Survey results provided no evidence that integration of an RD into the practice changed perceptions or knowledge over the course of 1 year.

**LIMITATIONS**—The present study included only 13 practices, mostly rural and all of at least moderate size.

**CONCLUSION**—Significant change is required if primary care practices are to play the role envisioned for them in stemming childhood obesity and chronic disease. Change will require identifying and addressing specific knowledge and skill gaps, such as those identified in this study. Respondents' positive perceptions of the benefits of RD integration suggest the importance of exploring this clinical model.

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The prevalence of diabetes, hypertension, and other obesity related comorbidities in the United States and internationally is growing at an alarming rate [1]. In the United States, approximately 16.9% of children and adolescents aged 2–19 years are obese, and 14.8% are overweight [2]. (Children are considered overweight when their body mass index [BMI] is equal to or greater than the 85th percentile, but less than the 95th percentile, for their age and sex; they are considered obese when their BMI equals or exceeds the 95th percentile [3].) Rates are even higher in North Carolina: 18.0% of the state's children and adolescents are obese, and 16.2% are overweight [4].

The Patient Protection and Affordable Care Act of 2010 emphasizes preventive health services, and national recommendations call on primary care providers (PCPs) to help stem childhood obesity [5]. The US Preventive Services Task Force specifically recommends screening children aged 6 years and providing or referring them for behavioral interventions, to improve weight [6]. While many evidence-based interventions for overweight children are highly resource intensive, practice-based interventions have the potential for large-scale replication, including in rural areas, where resources for overweight children are scarce [3]. Integration of nutritional counseling into primary care practices for adults has been promising, and experts say that the model merits further research [7–12]. Moreover, providing key treatment and prevention services on-site is essential to the patient-centered medical home, which is increasingly the gold standard for primary care [13].

However, research shows that providers feel they are not qualified for and/or are ineffective at treating childhood overweight and often find treating overweight children frustrating [14–17]. These attitudes reflect, and possibly affect, provider capacity to address pediatric obesity. For example, for most providers, the choice to intervene with a patient is typically based on the provider's subjective level of concern with the patient's weight issue [18–21].

Perceived barriers underlying these perceptions include lack of time, lack of resources (including dietitians), lack of reimbursement, and perceived treatment failures [15–16, 19, 22–25]. These findings suggest the potential for the integration of a registered dietitian (RD) to enhance a practice's capacity to address pediatric overweight; indeed, lack of an on-site RD is associated with low levels of perceived efficacy in this area [17]. Moreover, the KIDPOWER pilot indicates that RD services delivered to overweight children in a rural primary care setting may improve eating and television-watching habits, as well as weight management [26]. Potential reimbursement for nutritional counseling by PCPs and RDs has

increased substantially in recent years. North Carolina Medicaid and Blue Cross and Blue Shield of North Carolina now cover medical nutrition therapy for overweight children.

This paper presents the results of a survey of North Carolina primary care practices, and it builds on the existing literature in 3 ways. First, new questions were developed that assess multiple aspects of treatment. Second, for areas relating to clinical practices, this paper presents the perceptions and knowledge of a range of clinic personnel, not just physicians. Physician assistants and nurse practitioners often serve as PCPs, and nurses, social workers, and others steer patients to nutritional counseling and support behavior change. Responsibility for the implementation of some practice guidelines, billing for services, scheduling, and interpretation falls to clinic staff. While there has been research on the attitudes of WIC staff who provide education on pediatric overweight [27], our paper presents the perceptions and knowledge of typical clinic personnel, using select questions from a common question set. Third, the survey addressed perceptions and knowledge of RD services.

## Methods

### Overview

The survey discussed here was part of a larger study, IN4Kids, commissioned by the North Carolina Health and Wellness Trust Fund to assess the feasibility and effectiveness of integrating RDs into primary care practices to work with overweight children. Researchers from Duke's Community and Family Medicine Department administered the study, from July 2008 to December 2010, with data collection occurring between February 2009 and October 2010. The state's 4 academic medical centers were involved in the implementation, and an advisory panel commented on the study design and findings. Half-time RDs were integrated into 8 primary care practices, and a variety of data were collected about their use. IN4Kids was approved by the Duke institutional review board, under protocol 00012666.

### Sample

The academic medical centers helped identify 8 intervention practices in their respective regions. Inclusion criteria were (1) a minimum of 2000 children served annually, allowing for financial viability of RD integration; (2) a suburban or rural setting, limiting access to specialty weight-loss clinics; (3) not staffed by medical residents; (4) and expressed commitment to study requirements.

To identify changes associated with the RDs' presence, the practice survey was administered at the beginning of IN4Kids and 1 year later, at the 8 intervention sites and at 5 control practices. The latter were selected to match the intervention sites in size, regional diversity, and mix of practice type. Of the 13 practices, 5 were in the western part of the state, 5 were in the Piedmont, and 3 were in the east. Ten were located in rural settings, and 2 were suburban. Nine were pediatric practices, and 4 were family practices, including 2 federally qualified health centers. At baseline, none had an RD on-site half-time or more, but 3 had (or recently had) some RD presence. All 413 providers and staff across the 13 sites were eligible to complete the survey, which was distributed by the practice managers at a practice meeting.

### Instrument

Survey domains were based on (1) elements of pediatric obesity treatment identified in the guidelines for preventing and treating childhood overweight and obesity, from the National Initiative for Child Healthcare Quality [28]; and (2) prior research [17, 27]. Survey questions

(not validated) were developed by the study team and were refined with input from the advisory committee and after piloting with PCPs.

Comfort, confidence, and perceived-effectiveness questions used 5-point Likert scales, plus “not applicable.” Dimensions assessed for comfort and confidence were as follows: raising the issue of overweight with parents, recommending nutritional resources, ability to conduct motivational interviewing, ability to bill for obesity as a diagnosis, advising parents on healthy foods, making changes to individual practice habits to better address childhood obesity, the practice’s current capacity to address childhood obesity, and the practice’s capacity to make changes to better address childhood obesity. Perceived effectiveness was assessed on action dimensions: raising the issue of overweight, recommending nutritional resources, and advising parents on healthy foods.

Four-point Likert scales, ranging from “strongly agree” to “strongly disagree” (and accompanied by a “don’t know” option), were used to assess perceptions of the RD’s ability to discuss food choices, create a physical activity plan, create a nutrition plan, independently bill for services, and conduct group nutrition sessions—all in the scope of RD practice. Four-point Likert scales, ranging from “greatly” to “not at all” (and accompanied by a “don’t know” option), were used to assess the perceived extent of RD benefits, including increasing the provider’s ability to serve patients, improving the provider’s ability to promote weight management, providing the practice with guidance and advice on nutrition, providing the practice with guidance on physical activity, providing billable visits, broadening support for patients, providing more time for nutritional counseling, increasing referrals to RD services, and increasing referrals to other specialty care.

## Analysis

This paper addresses the following questions. The first 4 were answered using baseline data. (1) How comfortable, confident, and effective do PCPs feel with treating pediatric obesity? (2) What do PCPs know about what an RD can do, and what do they perceive to be the benefits of having an RD at a clinic? (3) How comfortable, confident, and effective do other clinic personnel feel with the dimensions of treating pediatric obesity that fall within their scope of practice? For nurses, social workers, and psychologists (described here as “other health care providers” or “non-PCP health care providers”), these include all dimensions of comfort, confidence, and effectiveness, excluding motivational interviewing and billing for obesity; for management staff, these include billing for obesity, changing individual practice, the practice’s capacity to treat pediatric obesity, and the practice’s capacity to change; for remaining personnel, these include the practice’s capacity to treat pediatric obesity and the practice’s capacity to change; for billing staff, these also include comfort and confidence with their knowledge of billing for obesity. (4) What is the management staff’s knowledge of the RD’s capacity, and what are their perceptions of the benefits of the integration of an RD into a practice? Do billing staff know that RDs can bill independently for services, and do they believe this to be a benefit of RD integration? (5) Did comfort, confidence, perceived effectiveness, and perceptions and knowledge of RD services change more in the intervention practices after the integration of the RDs than they did in the control practices during the same period? We assessed relative change for PCPs and other health care providers across domains, and relative change for all respondents in their comfort and confidence with the practice’s current capacity and its capacity to change.

Data analysis was performed by use of SPSS (version 17.0). Missing responses and responses of “not applicable” were removed from analysis. “Don’t know” was treated as a meaningful response. Change was categorized as improvement vs. no improvement (including deterioration), and logistic regression was used to assess whether being in the intervention or in the control group predicted this dichotomous outcome. Statistical

significance was set at  $P < .05$ . Summary statistics presented in tables dichotomize responses into the 2 top categories vs. all other meaningful responses.

## Results

### Sample description

Of the 413 clinic personnel surveyed, 278 (67.3%) responded. The minimum site-specific response rate was 52%. Five RDs, WIC nutritionists, or nutrition assistants were excluded, because their perspectives would be unique. The resulting sample comprised 273 (66.9%) of a target population of 408 (413 minus the 5 removed).

One-third of the respondents were from family medicine practices, and two-thirds were from pediatric practices. PCPs accounted for 17.6% of respondents; 4 of 5 PCPs were medical doctors. The rest were divided between nurse practitioners and physician assistants. Other health care staff who can address weight issues accounted for 19% of the sample; this group included registered nurses and licensed practical nurses (who together compose most of the group), social workers, and psychologists. Practice managers, nurse managers, and other management staff accounted for 5% of respondents. All other clinic personnel—ranging from pharmacy technicians to dentists to receptionists—accounted for 59% of respondents; this included 14 billing staff.

Of the baseline sample, 231 (84.6%) responded to the posttest. The composition of this group was virtually the same as that for the baseline sample.

### Primary care provider perceptions and knowledge

As seen in Table 1, comfort among PCPs ranged broadly: 15.2% were “comfortable” or “very comfortable” with their ability to bill for obesity, whereas 97.9% were “comfortable” or “very comfortable” with their practice’s capacity to change. The small numbers prohibited our separating medical doctors, physician assistants, and nurse practitioners for analysis, but there was no obvious pattern of differences between these groups. On most dimensions, a majority of respondents were at least comfortable (billing and motivational interviewing were exceptions), although for no dimension were most respondents *very* comfortable. For most dimensions, confidence (not shown) was slightly lower than comfort. Personal perceived effectiveness was notably lower than both comfort and confidence, ranging from 35.4% to 60.4%.

Most PCPs were aware of each of the RD capabilities listed in the survey (data not shown). PCPs generally gave high ratings to the potential benefits of having an RD; only 1 potential benefit—the extent to which RDs increase a practice’s referrals for other specialty services—was rated poorly.

### Other health care providers’ perceptions and knowledge

While a majority of other health care providers reported feeling comfortable with the dimensions of obesity treatment relevant to their work, these majorities were in almost all cases notably lower than those for the PCPs (Table 2). The small numbers prohibited our separating nurses and behavioral specialists for analysis, but there was no obvious pattern of differences between these groups. Registered nurses and licensed practical nurses—the 2 largest groups—were similar in their distribution of responses. Strikingly, a minority of non-PCP health care providers reported feeling comfortable raising the issue of overweight with parents. As for PCPs, confidence was slightly lower than comfort, and perceived effectiveness was considerably lower.

As for PCPs, other health care providers were generally aware of the RD's scope of practice and gave high ratings to most potential benefits. In contrast to PCPs, other health care providers did not agree that RDs could independently bill for their services (41.2% in agreement), and they were unlikely to see billable visits as a potential benefit of having an RD in a practice (47.1%).

### Perceptions and knowledge of management staff

Sixty percent of management staff (data not shown) expressed comfort with their knowledge of billing for obesity as a diagnosis. Similar percentages were comfortable with changing their individual practice habits to address childhood obesity and with the practice's capacity to address this issue; three-quarters were comfortable with their practice's capacity to change. As with other respondents, confidence was lower than comfort. Management staff were similar to other groups in their knowledge of RD capacity and their perception of RD benefits, although they were less sure than providers that RD integration would increase referrals for RD services (64.3%).

### Perceptions and knowledge of other clinic personnel

One-quarter of remaining practice personnel declined to answer questions about their comfort with their practice's capacity to address childhood obesity and to change. Among respondents, 69.9% expressed comfort with current capacity, and 79.1% expressed comfort with the practice's capacity to change. Confidence was slightly lower. Only half of billing staff were comfortable with their knowledge of billing for obesity. Two-thirds knew that RDs could bill independently for services; only one-third gave this potential benefit a high rating.

### Changes over the course of the study

Table 3 presents findings on 1-year changes in comfort and effectiveness for PCPs and other health care providers. We also analyzed their changes in confidence and knowledge and their perceptions of RDs (data not shown). Table 4 presents changes for all respondents on the dimensions of comfort with practice capacity and with its capacity to change.

There is strikingly higher comfort and perceived effectiveness levels at baseline among respondents from intervention practices, compared with those from control practices. This may reflect selection bias, since intervention practices were required to be committed to RD integration and to addressing pediatric obesity. Alternatively, it may reflect the fact that intervention practices knew an RD would be joining their practice (or, in some cases, had just joined). Either situation could complicate the goal of conducting a meaningful pre-post, intervention-control comparison.

With some exceptions, intervention and control groups improved on the same dimensions—possibly because of increasing national attention to pediatric obesity or because of the effect of being studied. Comparative testing of the change in intervention and control groups, which was conducted to minimize these possible threats to internal validity, showed no statistically significant differences in changes for the 2 groups.

## Discussion

For most dimensions of obesity treatment, most PCPs expressed comfort and confidence with their capacities. However, only a minority was *very* comfortable or confident. Moreover, PCP comfort and confidence were low for the ability to conduct motivational interviewing and for knowledge of billing for obesity. Also striking were the low levels of comfort and confidence for raising the issue of overweight among nurses, social workers,



and psychologists and the relatively low levels of comfort and confidence for other dimensions. As in similar studies, most PCPs and other health care providers did not perceive themselves as effective at raising the issue of overweight, at recommending nutritional resources, or at advising parents on healthy foods [14–17].

While most management staff reported being comfortable and confident with their knowledge of billing for a diagnosis, some were not, and comfort and confidence were low among billing staff. Many respondents were unaware that RDs can bill independently and/or did not perceive RDs to be an important source of billable visits or referrals to specialists.

These data suggest that significant change is required if primary care practices are to play the role envisioned for them in stemming childhood obesity and chronic disease. Four knowledge/skill gaps were highlighted in the present study: (1) perceived effectiveness of providers with raising the issue of overweight, recommending nutritional resources, and advising parents on healthy foods; (2) comfort and confidence among non-PCP health care providers with treating pediatric obesity; (3) knowledge of billing for obesity and RD services; and (4) providers' ability to conduct motivational interviewing. Respondents' positive perceptions of the benefits of having an RD in a practice suggest the importance of exploring this model as one approach to improving clinical capacity to address pediatric obesity. While respondents generally understood the scope of RD practice, addressing gaps in this area (such as knowledge of billing) will promote integration success.

There was no evidence that having an RD on-site for 1 year led to improvements in perceptions and knowledge. This analysis may have been weakened by selection criteria for the intervention group or by the fact that, at baseline, they were already aware of or had already embarked on a course of RD integration.

Confidence was consistently lower than comfort. Inclusion of both constructs in the survey was premised on the idea that they were different. This appears to be somewhat true; confidence may more closely reflect perceived abilities, whereas comfort may more closely reflect attitude.

## Limitations

The present study included only 13 practices, mostly rural and all of at least moderate size. The study sample is not representative of the state's practices overall, nor was this the study goal. Practices vary, and this study was not designed to make generalizable comparisons of practice types (eg, pediatrics vs family medicine). We did conduct a number of exploratory comparisons of these 2 groups. These showed some differences between the groups, but "take home" messages were generally the same as those for the total sample.

Study strengths include the broad range of concerns and respondent types covered. The sample was geographically diverse, and it included both pediatric and family medicine practices, as well as 2 federally qualified health centers. Findings on perceived effectiveness were consistent with those from other studies.

## Conclusion

The results of the present study suggest that enhancing the role of primary care in the treatment of pediatric obesity requires attention to (1) strengthening provider skills, particularly for non-PCP providers; (2) strengthening PCP skills in motivational interviewing; and (3) training practices in billing for obesity as a diagnosis and, where relevant, for RD services. Survey findings support the exploration of the integration of an RD into primary care.

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**TABLE 1**

## Primary Care Providers' Comfort and Perceived Effectiveness With Treating Pediatric Obesity

<b>Factor</b>	<b>Comfortable or very comfortable</b>	<b>Effective or highly effective</b>
Raising the issue of overweight	47 (97.9)	29 (60.4)
Recommending nutritional resources	28 (58.3)	17 (35.4)
Ability to conduct motivational interviewing	9 (19.1)	...
Ability to bill for obesity	7 (15.2)	...
Advising parents on healthy foods	37 (77.1)	26 (54.2)
Changing practice's habits to address childhood obesity	32 (66.7)	...
Practice's current capacity to address childhood obesity	23 (47.9)	...
Practice's capacity to change to address childhood obesity	26 (55.3)	...

Note. Data are no. (%).

**TABLE 2**

Non-Primary Care Provider Health Care Providers' Comfort and Perceived Effectiveness With Treating Pediatric Obesity

<b>Factor</b>	<b>Comfortable or very comfortable</b>	<b>Effective or highly effective</b>
Raising the issue of overweight	19 (39.6)	9 (21.4)
Recommending nutritional resources	25 (53.2)	16 (37.2)
Advising parents on healthy foods	28 (59.6)	22 (52.4)
Changing practice's habits to address childhood obesity	23 (57.5)	...
Practice's current capacity to address childhood obesity	34 (69.4)	...
Practice's capacity to change to address childhood obesity	35 (76.1)	...

Note. Data are no. (%).

Change in Comfort and Perceived Effectiveness for Primary Care Providers and Other Health Care Providers, by Intervention and Control Groups

TABLE 3

Factor	Comfortable or very comfortable				Effective or very effective			
	Intervention		Control		Intervention		Control	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Raising the issue of overweight	35 (62.5)	36 (64.3)	16 (80.0)	11 (55.0)	20 (38.5)	27 (51.9)	9 (42.9)	12 (57.1)
Recommending nutritional resources	31 (55.4)	43 (76.8)	9 (45.0)	12 (60.0)	19 (35.2)	30 (55.6)	7 (33.3)	12 (57.1)
Advising parents on healthy foods	40 (70.2)	42 (73.7)	14 (70.0)	17 (85.0)	27 (51.9)	30 (57.7)	12 (57.1)	16 (76.2)
Changing practice's habits to address childhood obesity	35 (68.6)	33 (64.7)	11 (57.9)	11 (57.9)	...	...	...	...
Practice's current capacity to address childhood obesity	38 (66.7)	46 (80.7)	8 (40.0)	11 (55.0)	...	...	...	...
Practice's capacity to change to address childhood obesity	41 (73.2)	44 (78.6)	8 (44.4)	10 (55.6)	...	...	...	...

Note. Data are no. (%).

**TABLE 4**

Change in Comfort With Practice Capacity and Practice's Capacity to Change for All Respondent Types, by Intervention and Control Groups

Factor	Comfortable or very comfortable			
	Intervention		Control	
	Pre	Post	Pre	Post
Practice's current capacity to address childhood obesity	85 (72.6)	98 (83.8)	20 (46.5)	26 (60.5)
Practice's capacity to change to address childhood obesity	88 (77.2)	91 (79.8)	25 (64.1)	24 (61.5)

Note. Data are no. (%).