

Research Article

Factors Influencing Physician Referral Decisions into a Family-Based Pediatric Weight Management Program

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Abstract

Pediatrics remains as a recognized discipline for the referral of weight loss management amongst children and their family. The purpose of this study was to identify the key provider, patient and process factors that influence physician referrals to a weight management program for children and families. We performed a cross-sectional analysis of data collected from pediatricians and family medicine physicians using both online and paper-and-pencil formats. Data collected include demographic and training information; attitude, knowledge and self-efficacy for obesity treatment; and influences on referral practices to an evidence-based weight management program for children and families. Pearson χ^2 and Spearman correlations examined bivariate relationships between training, knowledge; self-efficacy, behavior and referral variables, and independent samples t-tests were used to examine differences between types of physician. Fifty-two physicians completed the survey and have been in practice 22.0 ± 8.8 years. Physicians perceive a lack of patient interest in the program as the biggest influence on their referral practices; however lower levels of overall referrals were associated with a lack of physician knowledge and training in the referral process ($r(39) = -0.39, p = .015$), and by physicians' concern over the amount of time spent with each family during the referral process ($r(37) = -0.42, p = .011$). Physicians' own healthy eating behavior was associated with their confidence in assisting families with healthy eating and physical activity behaviors. Conclusions: In our sample of pediatricians and family medicine physicians from a large health system, findings suggest that building physician self-efficacy in counseling and referral practices to evidence-based programs must be a priority when working toward long-term improved obesity prevention and treatment.

INTRODUCTION

While the prevalence rates of childhood obesity has reached a steady plateau [1], there is still a growing public health concern about continued prevention and treatment of this disease [2] given that childhood obesity is associated with both immediate and long-term health consequences [3,4]. Pediatricians and family medicine doctors may be the front line defense for childhood obesity, primarily because they meet with children and families regularly for well-child visits, and have the ability to identify early obesity risks. National guidelines recommend that the initial management and care for children with overweight and obesity occur in primary care environments [5], yet physicians may not have enough time, or receive adequate respect or reimbursement for their preventive or counseling efforts [6].

Referral patterns for childhood obesity are often influenced by correct identification of obesity or one of the comorbidities, and the decision to treat the child in the primary care setting or refer out to subspecialty care [7]. Choosing the most effective method for treatment or referral is complex given that providers often have limited access to evidence-based programs or specialists to whom they can refer children and families. Access to effective healthy eating and physical activity programs can have a positive

impact on the health and well-being of children and families struggling with obesity [8,9]; however, many programs and clinical trials developed for children and families have struggled with recruitment and retention [10]. Data from a recent study suggests that physicians who have a history of participating in research and who have a relationship with an academic medical center will refer eligible preschoolers to a free program as long as it doesn't require additional clinical time; however, referrals to the program were still influenced by physicians' perceptions of family receptiveness to the program [11]. Ensuring that physicians are referring families to effective programs is a keystone of the treatment of childhood obesity. Limited data exist on the referral practices of physicians to evidence-based obesity prevention and treatment programs.

The purpose of this study was to understand the physician referral process to an established, evidence-based weight management program for children and their family developed by a large health system. Using a cross-sectional study design, the aims were to 1) determine the key individual physician factors, such as knowledge and self-efficacy, that influence referrals, and 2) explore provider, patient and process barriers that influence referrals to a weight management program for children and their families. The referral process consists of the physician discussing

the program with the patient (this can be very brief or lengthy depending on the physician) and then submitting an electronic referral via the electronic medical records (EMR) system. Optimizing the referral and follow-up procedures leading to program enrollment and family participation in pediatric weight management programming is an essential step in reducing rates of childhood overweight and obesity.

MATERIALS AND METHODS

Participants

Recruitment: Physician participants were recruited in 2015 using a two-step process. First, an online survey was developed in September 2015 using Qualtrics survey software (Provo, UT). The survey was sent to all health system pediatricians and family medicine doctors, with three rounds of follow up email reminders sent once per week for three weeks. Second, paper and pencil questionnaires were distributed at a pediatrician quarterly meeting in the fall of 2015. Pediatricians in attendance who had not yet completed the online survey were asked to complete the paper and pencil version. A total of 183 surveys were sent via Qualtrics to physicians' email addresses. Three email addresses were duplicates, two emails bounced back as invalid, three physicians reported they did not see children in a clinical setting and therefore could not respond to the survey, four declined to provide consent, fifteen had never heard of the weight management program, and three provided incomplete data for a total of 44 valid online surveys. Eight pediatricians who were not reached via the online survey completed the paper and pencil survey, for a total sample size of 52 pediatricians and family medicine doctors (collectively referred to as "physicians"), for a response rate of thirty percent, or 32.5% if those who had never heard of the program were not included in the sampling frame. All study procedures were approved through the Henry Ford Health System internal review board, and all participants completed consent documents prior to data collection (Figure 1).

Measures

Demographics and training: Physicians were asked to answer several demographic and training questions. Examples include how long they have been in practice (*number of years*) and whether they have received special training to address nutrition, physical activity and obesity among children (*yes/no, please describe*).

Attitude, Knowledge and Self-efficacy: Physicians were also asked their agreement with statements related to their role in obesity treatment, their knowledge of theory-based behavior modification techniques, self-monitoring, goal setting, and the environmental determinants of obesity using questions created by the research team (e.g., I am confident in my ability to assist children and families with goal setting related to increasing healthy eating and physical activity). Responses were on a 5-point Likert scale from *strongly agree (5)* to *strongly disagree (1)* and showed moderate level of internal consistence in this sample (Cronbach's $\alpha = .74$).

Additionally, physicians were asked about their own physical activity and eating habits. Physical activity was measured using the valid and reliable single-item question, "In the past week, on

how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate (this may include sport, exercise, and brisk walking to get to and from places, but should not include housework or physical activity that may be a part of your job)" [12]. Dietary quality and healthy eating was measured using the following question, "How would you rate the overall nutritional content of your current diet?" with the following response categories: *excellent (5)*, *very good (4)*, *satisfactory (3)*, *poor (2)*, and *unsure (1)*.

Knowledge of the Program and Factors that Influence Referral: Physicians were asked about their knowledge of the weight management program, their program referral history, factors that influence referral, and their perceived role in obesity prevention and treatment. To understand factors that influence referral, we reviewed previous studies [13,14] and solicited opinions from an expert panel (2 pediatricians and 2 obesity researchers). The result was three categories of factors that influence referral: 1) provider characteristics (limited knowledge of the referral process or the program by the physician and office staff), 2) patient or family attributes (lack of patient interest, difficulty of families and children to change behavior) and 3) process barriers (amount of time, staff resources, reimbursement, cumbersome referral process, required follow-up with families, lack of information to provide to families). Physicians were asked to rate the factors on a 4-point Likert scale to indicate how frequently each factor influenced their referrals to the weight management program: *never influences referral (1)*, *somewhat influences referral (2)*, *or influences referral a great deal (3)*. The additional response category, *not an issue (4)*, was combined with *never influences referral* to reflect that the factor did not negatively influence referral. Scale had a moderate to high level of internal consistency, as determined by a Cronbach's α of 0.61 for patient/family attributes, 0.83 for process barriers and 0.94 for provider characteristics.

Data analysis

Descriptive, univariate data analysis was used to investigate the distributions of all variables, describe demographic characteristics and examine frequencies of responses to individual questions. Pearson χ^2 and Spearman correlations examined bivariate relationships between training, knowledge, self-efficacy, behavior and referral variables. Independent samples *t*-tests were used to examine differences of various factors between type of physician (pediatrician vs. family medicine). Participant physical activity was recoded into a dichotomous variable if they met/did not meet the physical activity criteria of 4 or more days of at least 30 minutes of physical activity [15], and dietary quality was recoded into excellent/all others. A combined dichotomous variable was created to indicate which physicians met *both* the physical activity and dietary quality cut-points. All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 23.0 (Armonk, NY: IBM Corp.), and *p*-values of .05 or less were considered statistically significant.

RESULTS AND DISCUSSION

Participants

The 52 physicians (18 family medicine doctors, 34

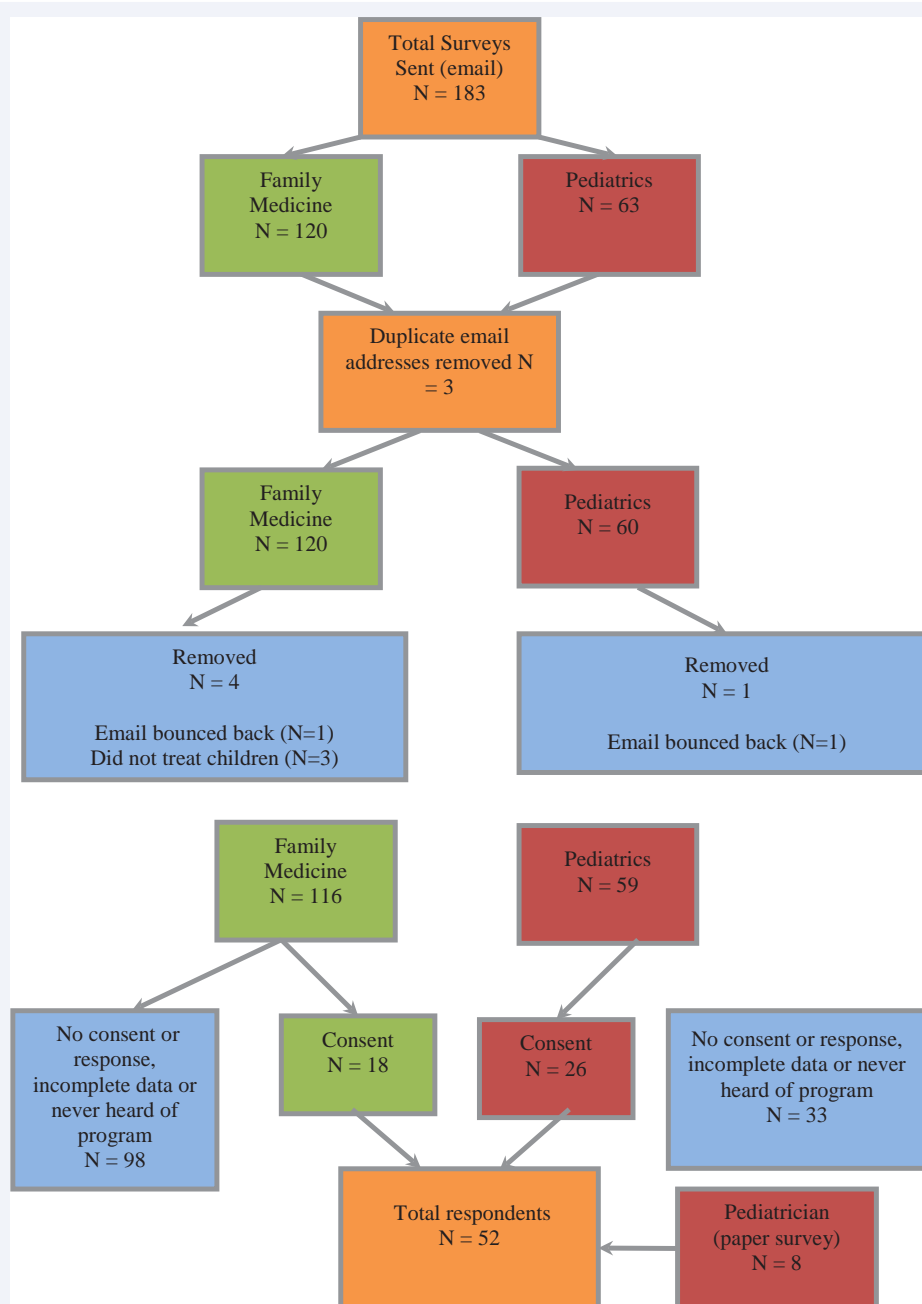


Figure 1 Physician Survey Recruitment.

pediatricians from the Detroit Metro area) who completed the survey have been in practice from 4 to 40 years (mean = 22.0 ± 8.8 ; median = 21), and only 20.4% reported receiving additional training to address nutrition and physical activity among children. Types of additional training included reading published literature, attending lectures on obesity, and motivational interviewing training. Physicians reported exercising 3.1 ± 2.1 days per week, and 35.6% met the physical activity requirement of 4 days per week. All physicians reported that the quality of their diet was at least satisfactory, and 25.5% said it was excellent. Only 6 (11.5%) of physicians met both the physical activity criteria of 4 days or more and reported their diet as excellent.

With respect to their role in obesity treatment, 75.5%

of physicians strongly agree that they have a key role in obesity prevention, and 85.7% understood the environmental determinants of obesity (as shown in Table 1). However, physicians felt less confident in their knowledge of behavior modification techniques, self-monitoring and goal setting, and this did not differ by type of physician (pediatrician or family medicine) or years in practice. Higher levels of physical activity among physicians was negatively associated with a belief the physicians have a key role in obesity prevention, ($r(45) = -0.32$, $p = .033$), and higher dietary quality was positively associated with confidence to assist families in healthy eating and physical activity goal setting, ($r(47) = 0.34$, $p = .020$). A strong belief in the role of physicians in obesity prevention was also positively

Table 1: Physicians' knowledge and role in obesity treatment*.

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Chose Not to Answer
Family doctors/pediatricians have a key role in obesity prevention.	37 (75.5%)	11 (22.4%)	1 (2.0%)	-	-	3 (5.8%)
I understand the environmental determinants for obesity.	22 (44.9%)	20 (40.8%)	7 (14.3%)	-	-	3 (5.8%)
I am well-versed in theory-based behavior modification techniques.	10 (20.4%)	13 (26.5%)	17 (34.7%)	7 (14.3%)	2 (4.1%)	3 (5.8%)
I encourage parents who have overweight children to incorporate self-monitoring.	11 (22.9%)	30 (62.5%)	3 (6.3%)	4 (8.3%)	-	4 (7.7%)
I am confident in my ability to assist children and families with goal setting related to increasing healthy eating and physical activity.	9 (17.3%)	20 (41.7%)	12 (25.0%)	6 (12.5%)	1 (2.1%)	4 (7.7%)

*Note: Percentages exclude missing values

Table 2: Total number of families that physicians have referred to the program.

Number referred to the program	n	Percent
None	11	22.0
1-3	7	14.0
4-6	3	6.0
7-9	5	10.0
10-12	4	8.0
13-15	4	8.0
16 or more	16	32.0

Table 3: Factors that influence program referral*.

Provider Characteristics	Influences referral a great deal	Somewhat influences referral	Never influences referral / Not an issue	Assoc. w/ actual referrals
My limited knowledge about the program	2 (5.3%)	5 (13.2%)	31 (81.6%)	ns
My limited knowledge about program referral process	3 (7.7%)	3 (7.7%)	33 (84.6%)	$r = -.39, p = .02$
Limited staff knowledge about program referrals	2 (5.1%)	11 (28.2%)	26 (66.7%)	ns
Inadequate training about program referrals	3 (7.7%)	3 (7.7%)	33 (84.6%)	$r = -.39, p = .02$
Lack of general healthy eating and physical activity information to provide to families	6 (15.8%)	9 (23.7%)	23 (60.5%)	ns
Having difficult conversations with families	3 (7.7%)	12 (30.8%)	24 (61.5%)	ns
I do not believe the program is effective	3 (8.1%)	1 (2.7%)	33 (89.2%)	ns
Patient/Family Attributes	Influences referral a great deal	Somewhat influences referral	Never influences referral / Not an issue	Assoc. w/ actual referrals
Lack of patient interest in the program	17 (43.6%)	16 (41.0%)	6 (15.4%)	ns
Difficulty of families and children to change their behavior	12 (31.6%)	19 (50.0%)	7 (18.4%)	ns
Process Barriers	Influences referral a great deal	Somewhat influences referral	Never influences referral / Not an issue	Assoc. w/ actual referrals
Reimbursement / lack of payment for incremental work	8 (20.5%)	8 (20.5%)	23 (59.0%)	ns
Amount of time spent with each family	7 (18.9%)	14 (37.8%)	16 (43.2%)	$r = -.42, p = .01$
Amount of follow up required	6 (15.8%)	7 (18.4%)	25 (65.8%)	ns
Resources – staff to assist	3 (7.9%)	15 (39.5%)	20 (52.6%)	ns
Cumbersome online program referral process	1 (2.6%)	1 (2.6%)	36 (94.7%)	Ns

*Note: ns: not significant

associated with behavior modification techniques ($r(49) = 0.34, p = .020$), understanding of environmental determinants of obesity ($r(49) = 0.54, p < .01$), and confidence to assist families with goal setting ($r(48) = 0.39, p < .01$).

Referral process

While all 52 physicians knew of the weight management program, only 78% ($n=39$) have referred families to the program. Fifty percent of physicians heard about the program from a colleague, 28.6% from an announcement at a professional development, 11.9% from an email or notice from the health system, 7.1% in other ways, and 3.4% from a parent. Number of referrals to the program did vary by length of time in practice, ($r(39) = 0.29, p = .076$), but this was not significant at the $p < .05$ level. Number of referrals did not differ by type of physician ($\chi^2(5) = 4.542, p = .47$) (Table 2).

Over 80% of physicians ($n=36$) agreed or strongly agreed that the referral process was easy. When asked to explain the referral process used in their office, including how and when physicians talk to parents and children, 29 (85.3%) physicians reported that they refer patients through the online patient referral system, 14 (41.2%) said they talk to families, 9 (26.5%) said they provide a handout to families about the program, and 3 (8.8%) said they were unsure or couldn't remember the process. Of the 34 physicians that responded to the question, 17 (50.0%) of them reported only referring families through the online system, without also providing handouts or talking to families about next steps or what to expect.

Among physicians who have referred families to the program ($n=39$), the main influences on their referral practices include patient/family attributes and process barriers, as shown in Table 3, below. Physicians perceive a lack of patient interest in the program as the biggest influence on their referral practices, as 84.6% indicated it influenced their referral decisions somewhat or a great deal. Physicians who have been in practice longer report that lack of patient interest is less of an issue in the referral process ($r(39) = -0.39, p = .014$). Many physicians also felt that it was difficult for families to change their behavior, and 81.6% of physicians indicated that this influenced their referral decisions; however, physician length of practice did not influence physician perception of family behavior changeability.

The amount of time spent with each family during the referral process (talking to patients, explaining the program, providing a referral) influenced physicians' decision to refer to the program, with 56.7% of physicians reporting that it influenced their decision somewhat or a great deal. Time was also negatively associated with actual number of families referred to the program ($r(37) = -0.42, p = .011$). Many also felt that staff resources to assist in the process (47.4%) and a lack of payment or reimbursement was an issue in referral (41.0%).

Among physicians, 39.5% felt that a lack of information on healthy eating and physical activity to provide to families influenced their referral practices to the program, and 38.5% felt that having difficult conversations with families also influenced their decision to refer. Both provider limited knowledge about the referral process, and inadequate training on the referral process were both negatively associated with actual referrals to

the program ($r(39) = -0.39, p = .015$ and $r(39) = -0.39, p = .015$, respectively). Physician knowledge of behavior change strategies, perceptions about their role, and self-efficacy to assist families with goal setting were not associated with number of referrals to the program.

DISCUSSION

The purpose of this study was to examine the referral practices of physicians to an evidence-based weight management program for families and children ages 9-13 years developed for a large health system. Physicians felt the amount of their referrals to the program was influenced by a lack of patient interest in the program, and a belief in the inability of families to change their behavior. When looking at physician responses and actual referrals to the program, lower levels of overall referrals were associated with a lack of physician knowledge and training in the referral process, and by physicians' concern over the amount of time spent with each family during the referral process. Half of the physicians in this study referred families to the program through the online health system software, but did not report talking with families or providing handouts that might assist them in decision making and enrollment. Further, many physicians expressed a concern that they didn't have adequate healthy eating and physical activity information to provide to families, which influenced their capacity to refer families to the weight management program. Physicians who held a strong belief in their role on the forefront of obesity prevention were more likely to understand environmental determinants of obesity and feel more confident in their ability to assist families with healthy eating and physical activity goal setting. And finally, physicians own healthy eating behavior was associated with their confidence in assisting families with healthy eating and physical activity behaviors.

Most overweight and obese children are not referred to another skilled provider or subspecialty care for treatment, regardless of age, BMI percentile and presence of comorbidities [7], and in a study of Georgia Primary Care Physicians (PCPs), very few (20%) reported referring high-risk patients to other health professionals for further evaluation or management¹⁶. Many family-based weight loss treatments for children rely on physician and self-referrals, in addition to advertisements in newspapers and online [17] as part of the integrated team approach to care. While many PCPs are committed to screening and obesity management practices, ensuring that physicians are referring families to effective programs is one key step in the treatment of childhood obesity, as recruitment to clinical weight loss trials or programs can take 9 months or more [18]. Physician self-efficacy for obesity prevention and treatment may affect their referral practices, especially when they feel ill-equipped to provide adequate healthy eating and physical activity resources to parents, or when they are uncertain if their efforts will be reimbursed, as is the case with our findings, and others [6,13,16]. In general, physicians have reported low self-efficacy in treating obesity [13], and even though efforts to target self-efficacy for obesity treatment among medical students is underway [19], there is a great deal yet to be done.

Many physicians cite a lack of patient interest in weight management and a perceived difficulty for patients to change

their behaviors as barriers to managing patients' diet, physical activity or weight [6,16]. Even when physicians are able to overcome barriers of resources and time, concerns about the family's response or interest remains a critical issue [11]. In our study, physicians' perception of a lack of patient interest in the program was the biggest influence on their referral practices; however, experienced physicians found this to be less of an issue in the referral process. It may be that more experienced physicians have well-developed communication and counseling skills and can better navigate the negative interactions that may occur when bringing up issues of overweight and obesity with families. Physicians may perceive a family receptivity as the key factor that influences their referrals to the program, yet limited knowledge about the referral process and inadequate training on the referral process was associated with actual referrals, regardless of physician experience.

The American Academy of Pediatrics Committee on Nutrition, Clinical Report suggests that the role of the pediatrician in the primary prevention and treatment of childhood obesity includes being able to incorporate theory-based behavior modification techniques in their interactions with patients, including encouraging self-monitoring, and focusing on family-based interventions [20]. Further, the report also urges pediatricians to understand the interconnected factors, such as food access and a lack of physical activity opportunities in neighborhoods, that lead to excessive weight gain among children [20]. In our study we found that physicians who were most familiar with the environmental determinants and the interconnected factors leading to obesity, were also more knowledgeable about behavior change techniques and were more well-suited to assist families in making positive changes. Further, physicians who understood the complexity of the problem, and their role in obesity prevention felt more confident assisting families, yet, this was not associated with greater referrals to the program.

The results of this study suggest the need to develop practice-based modifications, toolkits, targeted interventions or physician training that includes the referral process, strategies to elicit participation from families, and incorporating theory-based behavior modification techniques to help improve physician self-efficacy for program referral. The strengths of this study include its' specific focus on the referral process as one aspect of obesity management, and the inclusive sample size of all family medicine doctors and pediatricians in a large health system. Limitations include the cross-sectional nature of the data, which limits causal inferences, small sample size and the self-report nature of the data. Future studies might consider using actual reported referrals in addition to physician self-report. Even with these limitations, findings from this study, similar to other studies [6], conclude that building physician self-efficacy in counseling and referral practices to evidence-based programs must be a priority when working toward long-term improved obesity prevention and treatment.

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