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Assessment of Nutrition Education Among Pediatric Gastroenterologists: A Survey of NASPGHAN Members

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Abstract

Pediatric gastroenterology is the only pediatric subspecialty with nutrition as part of its official curriculum and objective. However, pediatric gastroenterology fellows feel that their baseline knowledge in nutrition is suboptimal. The purpose of this study was to assess the perceived effectiveness of nutrition training among pediatric gastroenterologists, identify areas of need for additional education, and determine the perceived role of the gastroenterologist in obesity management.

Methods—A survey was sent to members and fellows of the North American Society of Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) to assess general nutrition education as well as obesity management and educational needs.

Results—A total of 272 responses were received, for an overall response rate of 15.2% (272/1,784). Most responders reported having average or above-average knowledge base in all nutritional topics. There was strong interest in additional resources and a continuing medical education (CME) module on several nutrition topics including: nutritional requirements in specific gastrointestinal (GI) disease, failure to thrive/growth failure, and parenteral nutrition support, with the format of CME dependent on the topic. There was also a strong interest in additional CME on the management of pediatric obesity (67%), as most responders felt that the management of obesity in children requires subspecialty care. However, the perceived role of the pediatric gastroenterologist was one of support to treat the gastrointestinal and hepatic co-morbidities of obesity rather than serve as the main provider of comprehensive obesity care.

Conclusion—Pediatric gastroenterologists identified gaps in their nutrition knowledge base that may be attributed to the current nutrition education training during fellowship. Multiple topics were identified for additional nutrition education, including obesity management. The nutrition management challenges of today necessitate improved baseline nutrition knowledge and this focus on nutrition should begin at the fellowship level.

Keywords

Nutrition education; pediatric gastroenterology; obesity

Introduction

Malnutrition is center stage in today's health epidemics as both undernutrition and over-nutrition can lead to healthcare problems. Childhood malnutrition adversely impacts the overall lifelong health of individuals by affecting growth and development. Globally, malnutrition contributes to over half of all deaths in children under five years of age¹ and is associated with shorter adult height, decreased offspring birth weight, and a reduced capacity to learn resulting in lower educational outcomes and reduced adult income²⁻⁴. Over-nutrition in the form of obesity and related disease is increasing in prevalence and is directly correlated with heart disease, diabetes, stroke, liver disease, and cancer, among others⁵. Proper nutrition is integral for disease prevention as well as treatment, but there exists a shortage of physicians practicing nutrition medicine⁶.

This need for physicians to address nutrition, and specifically obesity, with patients has been highlighted as an objective of Healthy People 2000 and 2010⁷⁻⁸ and more recently by the Let's Move campaign to fight childhood obesity. However, there exists a gap between the desire for nutrition counseling and actual physician practice, as only approximately one-third of physicians routinely discussed nutrition during the clinical visit⁹. This disparity between patient desire and actual physician practice is confounding as even physicians agree that nutrition assessment should be a part of primary care visits. Physicians identify nutrition counseling as a clinical obligation¹⁰ and feel that patients would benefit from nutrition counseling, citing the role of nutrition in health maintenance as a key reason¹¹. In spite of these good intentions, physicians do not feel adequately trained to provide nutrition counseling¹⁰ and some perceive a lack of impact of counseling on patient behaviors¹²⁻¹³, thus creating a clinical void that needs to be filled. For example, management of obesity and its related complications has become a necessity in pediatrics but most healthcare providers also do not feel adequately equipped to deal with the pediatric obesity epidemic¹⁴. Perhaps most telling is that despite the existence of numerous community-targeted obesity education programs¹⁵, some physicians still feel undertrained to treat obesity¹⁶.

There is a clear need for improving physician comfort with obesity management and nutrition counseling. Historically, there has been a lack of emphasis on nutrition education during both medical school and residency and the overall quality of nutrition training during medical school has been perceived as inadequate by physicians¹⁷. Multiple studies since the 1950s have reinforced this physician perception on nutrition education¹⁸. Surveys have shown that interest in and the perceived relevance of nutrition declines throughout medical school¹⁹ and this waning interest extends into clinical practice as well²⁰. To combat this lack of interest as well as inadequate knowledge base among medical students²¹, there was a push for more structured nutrition education²². However, a study of the effects of structured nutrition education for second year medical students showed no improved nutrition knowledge or clinical application on assessment²³. It is likely that despite structured nutrition education, the nature, content, and duration of nutrition education in medical school varies greatly. In 1997, only 25.8% of the accredited medical schools reported a required nutrition course²⁴, and increased to 30% in a 2004 survey. The length of the nutrition course also varied from 2 to 70 hours²⁵.

More recently, there has been a renewed emphasis on nutrition education with the goal of creating a more comprehensive curriculum with the goal of fully integrating nutrition

education into medical training^{17, 26–27}. Strategies to improve exposure to nutritional education including computer-based nutrition curriculums and nutrition seminars^{28–29}. A recent study from England documents that directed training for medical students in the form of an intensive weekend workshop led to improved and sustained nutrition knowledge on assessment³⁰. The acceptability and apparent effectiveness of these education strategies for medical students is encouraging.

The challenges of nutrition education extend to residency training. Most of the existing nutrition training during pediatric residency is knowledge-based with limited training in counseling skills. A lack of educational resources, space in the curriculum, and trained faculty have previously been identified as perceived barriers to the development of additional education resources¹³. With the increasing prevalence of childhood obesity the development and use of effective training strategies should be a priority. Residents seem receptive to alternative education opportunities as a recent study demonstrated the effectiveness of training residents in a specific behavioral intervention for obesity in coordination with a community health initiative³¹. These successful initiatives suggest a recognition of the importance of and a renewed emphasis on nutrition education.

While both interest and training can be detriments to effective nutrition training, it would seem that for physicians who choose to specialize in pediatric gastroenterology, interest should not be a limiting factor. Pediatric gastroenterology, hepatology, and nutrition is the only medical subspecialty in the U.S. that includes nutrition as part of its official curriculum and objective, but remarkably, even pediatric gastroenterology fellows feel that their baseline knowledge and training in nutrition is suboptimal³². Contributing factors to inadequate nutrition training includes inadequate exposure to nutrition fundamentals during medical school and residency as well as an outdated perception of an insufficient market. However, with an increasing demand for nutrition counseling combined with a shortage of physicians comfortable practicing nutrition medicine, there is a need for optimizing nutrition education. Consequently, there has been a recent emphasis to improve the structure of nutrition training for pediatric gastroenterology fellows^{32–35}.

The purpose of our survey was to assess the perceived effectiveness of current nutrition training among pediatric gastroenterologists, identify areas of need for additional education resources, and determine the role of the gastroenterologist in obesity management.

Materials and Methods

Study Design

This study had a cross-sectional design. The Nutrition Committee and Obesity Task Force of NASPGHAN developed items for the survey which was sent to members and fellows of the North American Society of Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) via e-mail. The overall goal was to assess the need for material in nutritional topics that are of importance to NASPGHAN members. Specifically goals were 1) to identify nutrition topics of high priority for further educational emphasis, 2) to assess the need for obesity related educational resources, and 3) to determine the perceived role of pediatric gastroenterologists in obesity management.

Survey

The survey was comprised three parts: demographic information, consisting of 1 question; assessment of general nutrition education, consisting of 4 questions; and obesity management and educational needs, consisting of 8 questions (supplemental Fig 1, <http://links.lww.com/MPG/A134>).

The general nutrition education questions assessed baseline knowledge in 14 nutrition topics and then identified topics with a need for additional continuing medical education (CME), the format of CME, and the need of additional resources. The 14 topics included the following:

1. Basic nutritional physiology: Starvation, stress, age-related changes, energy estimates
2. Nutritional Assessment: Dietary history, clinical assessment, nitrogen balance, energy expenditure, body composition, markers of nutrition
3. Infant feeding: Physiology of lactation, composition of human milk and infant formulas, requirements of preterm infants
4. Special feeding programs: Cleft palate, swallowing dysfunction, food aversion, dysphagia
5. Failure to thrive/Growth failure: Differential diagnosis, management, outcomes
6. Nutritional requirements in specific gastrointestinal (GI) diseases: Acute gastroenteritis, inflammatory bowel disease, pancreatitis, celiac disease, non-alcoholic steatohepatitis, eosinophilic disorders, liver failure, intestinal failure
7. Nutritional support in non-GI disease: Inborn errors of metabolism, cystic fibrosis, diabetes, renal failure, anorexia nervosa, food allergy, marasmus, kwashiorkor
8. Role of diet in development of chronic disease: Rickets, obesity, insulin resistance, cardiovascular disease
9. Nutritional aspects of special diets: Ketogenic, vegetarian, low-fat, gluten-free, lactose-free
10. Enteral nutrition support: Indications, infusion devices, feeding tubes, enteral nutrition formulas, formula modification, drug interactions
11. Parenteral nutrition support: Indications, composition, administration, metabolic effects, complications
12. Refeeding syndrome: Edema, hypokalemia, hypophosphatemia
13. Micronutrient requirements: Vitamin D, omega-3 fatty acids, iron, zinc
14. Sports nutrition.

The obesity questions were designed to assess the perceived role of pediatric gastroenterologists in the management of obesity. Specific questions focused on the role of pediatric gastroenterologists in the assessment, management, and prevention of obesity as well as the role in weight management. In addition, interest in a postgraduate course on obesity with specific obesity-related topics for the content of such as course was surveyed.

Survey distribution

A Web-based survey tool, SurveyMonkey, was used to provide participants with electronic access to the survey. Subjects were invited to participate in the study by means of the central NASPGHAN office, which sent out an e-mail announcement that included the URL link to the survey. A reminder e-mail to complete the survey was sent after 2 weeks. Responses were collected and study enrollment was closed after one month.

Statistical analysis

Results were collected and tallied in Survey Monkey. The data were exported into spreadsheet and tabulated manually. Answers to questions were indicated by a response to a 5-point scale. Statistical significance level was set at $p < 0.05$.

Results

Respondent characteristics

A total of 272 responses were received over the course of a month, from April 27, 2010 through May 27 of 2010. With a total of active NASPGHAN members at 1,563 physicians and 221 fellows, the overall response rate was 15.2% (272/1,784). The response rate for fellows was only 12.7% (28/221). Of the 272 respondents, the majority were academic physicians from university medical centers, representing 63.2% of the respondents. Physicians in private practice represented 18.4%, fellows represented 10.3%, and 8.1% of the respondents reported an affiliation with industry, a community clinic, a children's hospital, or a Health Maintenance Organization (HMO), or reported being retired (Table 1).

Nutritional Knowledge Base

Respondents were asked to self-assess their nutritional knowledge base. Responses were stratified among 5 categories: excellent, above average, average, below average, and poor (Table 2). The vast majority of responders reported having average or above-average knowledge base in all nutritional topics. Responders reported to have the strongest knowledge base (either above average or excellent) in *failure to thrive/growth failure* (81.4%, 218/268), *nutritional requirements in specific GI disease* (74.6%, 200/268), and *enteral nutrition support* (71.4%, 192/269). Despite this high rate of excellent knowledge base among the responders, failure to thrive was the only topic in which greater than 50% of fellows reported an excellent or above average knowledge base.

Assuming that an excellent or above average response reflects a comfortable knowledge base, the responses for these two categories were combined to assess for differences in the knowledge base between pediatric gastroenterologists in private practice versus academics. Using this combined value, three topics had more than a 10% difference between physicians in private practice versus academics. More pediatric gastroenterologists in academics reported an excellent or above average knowledge base for the topic of *nutritional assessment* (66% to 54%) while a higher percentage of physicians in private practice reported a comfortable knowledge base with *special feeding programs* (67% to 53%) and *nutritional aspect of special diets* (52% to 41%).

Very few responders reported poor knowledge for any of the topics, but some did report having a below average knowledge base for some topics. Specifically, responders reported to be least knowledgeable (either poor or below average) in *sports nutrition* (41.4%, 109/263), *nutritional support in non-GI disease* (19.6%, 53/270), and *nutritional aspects of special diets* (14.4%, 39/271). Among fellows, greater than 40% of fellows reported poor or below average knowledge base in the topics of sports nutrition and nutritional support in non-GI diseases.

Desirable CME topics in nutrition

Respondents were asked to identify desirable nutritional topics for CME to see if there was a correlation between knowledge base and the desire for CME. Responses were divided into 5 categories: extremely important, very important, important, less important, not important at all (Figure 1, supplemental Table 1 [<http://links.lww.com/MPG/A135>]). The vast majority of respondents expressed a strong interest in a CME module on *nutritional requirements in*

specific GI disease, with 82.3% (220/267) indicating the topic to be either extremely or very important. Educational material was also highly desirable in *failure to thrive/growth failure* (71%, 188/265), *parenteral nutrition support* (70.4%, 188/267), and *micronutrient requirements* (67.1%, 177/264). The topic of *sports nutrition* was notable for having the most responses for being either less important (19.3%, 50/259) or not important at all (2.7%, 7/259). Fellow responses generally mirrored the overall responses with the same four topics being the most desirable CME topics.

Desirable CME format

For each topic, the preferred format of CME was surveyed (supplemental Table 2, <http://links.lww.com/MPG/A136>). The available formats included: Web-based, Review course, Postgraduate breakout session, Meet-the-Professor Luncheon, Clinical cases, Journal Article, or Review Book. In general, a review course (34.9%) and web-based modules (34%) were the most desirable formats for CME for all topics. A meet-the-professor luncheon (6.9%) was the least desirable CME format and the preference for other CME formats included journal articles (19.1%), review book (185), post-graduate breakout session (16.7%), and clinical cases (15.3%).

Among the topics, there were different preferences as to the modality of CME. *Nutritional assessment of specific GI disease* was a highly favored topic for a review course. *Special feeding programs* was noted to be a good topic for a postgraduate breakout session; journal articles were favored for topics such as *refeeding syndrome* and *nutritional aspects of special diets*. While very few responders favored a meet-the-professor luncheon (2.4%–10.9%), the topics that received some interest for a meet-the-professor luncheon were *role of diet in development of chronic disease* and *sports nutrition*.

Desirable additional resources

To determine if the current CME resources for the nutritional topics were sufficient, the need for additional CME resources was surveyed based on a five point scale: high priority, moderate priority, neutral, low priority, and not at all. The highest priority for additional CME resources was noted for *nutritional requirements in specific GI diseases*; 34% (82/241) of responders indicated a high priority for this topic. Other topics of high priority include *parenteral nutrition* (20.2%, 49/243), *failure to thrive* (19.9%, 48/241), *nutritional support in non-GI disease* (18.9%, 46/243), and *role of diet in development of chronic disease* (18.6%, 45/242). Topics that received the most responses for having either a low priority or no need for additional resources included *sports nutrition*, *infant feeding*, *failure to thrive*, and *basic nutritional physiology* (Figure 1, supplemental Table 3 [<http://links.lww.com/MPG/A137>]).

CME in obesity

Almost 67% of responders indicated that they would be either very or somewhat interested in pediatric obesity as a main topic for postgraduate one day educational course (postgraduate course), with only 17% not interested (Table 3). The most popular obesity topic for the postgraduate course was for pharmaceutical approaches to weight management, as either a didactic or discussion forum. Other topics of interest for the postgraduate course included nutritional deficiencies, bariatric surgery, and pharmaceutical approaches to treat hyperlipidemia. Fellows favored the topic of nutritional deficiencies in obesity for both didactic and discussion over all others, while private practice physicians favored the topic of pharmacological approach to weight management (Table 4).

Role of pediatric gastroenterologist in obesity management

As respondents identified a need for additional CME in obesity, respondents were surveyed for their perception of the role of the pediatric gastroenterologists in obesity management. There was not a strong consensus on the primary physician for obesity management with the following type of physicians identified: pediatric gastroenterologist (39%), pediatric endocrinologists (36.4%), obesity program (34.6%), pediatric obesity specialist (30.1%), and primary care physician (21%). Most responders felt that the management of obesity in children should require collaboration among multiple pediatric subspecialists, but most physicians surveyed did not have an obesity center devoted to this care.

The main identified role of the pediatric gastroenterologist was to treat the gastrointestinal and hepatic comorbidities of obesity (93.4%). Other identified roles for the pediatric gastroenterologist in obesity management included managing obesity comorbidities (36%), performing nutritional assessment (29.4%), and weight management (19.1%). Most pediatric gastroenterologists selected that pediatric gastroenterologists play a supporting role in preventing, assessing, and managing pediatric obesity, not a main role or leadership role (Figure 2).

Discussion

Nutrition is an integral part of medical care today. With the challenges of obesity and other causes of malnutrition, physicians recognize the importance of effective nutrition counseling. A nationwide survey of family physicians reported that a majority of physicians believe that nutrition plays either a “most important” (21%) or “major” (73%) role in treating and managing illness and disease. Moreover, a striking majority (96%) of the physicians surveyed reported that nutrition was either the “most important” or of “major” importance in preventing illness and disease⁹. This perception of the importance of patient nutrition education is reflected by government initiatives such as Healthy People 2010, with a specific objective to increase the proportion of patient nutrition counseling during primary care visits to 75%. However, there continues to be a disparity between the proportion of patients identified who would benefit from nutrition counseling and those who actually receive it. Potential barriers to providing nutrition counseling include a lack of adequate training, time, resources, and compensation⁷.

Adequate training remains a key obstacle towards the practice of nutrition medicine. Despite the perceived importance of nutritional training, in general, nutrition training has been lacking at all levels of education from medical school to residency to fellowship training^{10, 17, 32, 36}. Surveys of medical students indicate that students are not confident in their ability to address specific nutritional requirements across the life cycle or the role of nutrition in the treatment of disease and that more time dedicated to nutrition education³⁶. It is concerning that the physicians of tomorrow do not feel confident in their nutrition education, as clinicians should possess baseline nutrition knowledge to be effective patient advocates.

Pediatric gastroenterologists, who receive specialized nutrition education, also share this lack of knowledge, as our survey confirms the perceived need for additional exposure to topics in nutrition among pediatric gastroenterologists. Of the 14 topics in nutrition, failure to thrive was the only topic in which greater than 75% of pediatric gastroenterologists noted excellent or above average knowledge base. Practice setting does not seem to impact perceived knowledge base, as subgroup analysis reveals similar responses between physicians working in a private practice versus academic setting with the exception of three topics: special diets, special feeding programs, and nutrition assessment. Fewer physicians in academics reported a comfortable knowledge base in special diets and special feeding

programs, perhaps reflecting the nature of being in an academic setting, where specialized nutrition support may more readily be available. Furthermore, over 50% of all respondents report average or below average knowledge base in 5 out of 14 nutrition topics including micronutrient requirements, role of diet in chronic disease, and special diets. These findings are concerning as being in a subspecialty that practices nutrition, pediatric gastroenterologists should possess an above average knowledge base in nutrition.

This perception of inadequate nutrition training begins at the fellowship level, but seems to persist into practice, as the majority of respondents also wish for additional CME in nutrition. While there are no specific studies among pediatric gastroenterology fellows, studies have measured the exposure to and baseline knowledge of nutrition of gastroenterology fellows in Canada. One study identified knowledge gaps among gastroenterology fellows as the majority of the fellows had no exposure to obesity, outpatient, or inpatient nutrition³³. Similarly, a survey of 32 gastroenterology fellows in Canada indicated that fellows perceived their knowledge of nutrition as suboptimal, specifically in obesity, micronutrients, and macronutrients. An objective test to evaluate nutrition knowledge confirmed this perception³². These findings mirror our study observations among pediatric gastroenterology fellows, as there was no nutritional topic in which greater than 15% of fellows reported an excellent knowledge base. Conversely, there were 4 topics in which over one-third of fellows reported a below average or poor knowledge base—sports nutrition, micronutrient requirements, nutritional aspects of special diets, and nutritional support in non-GI diseases. This average knowledge base illustrates the need for additional training and CME in nutrition.

Interestingly, while respondents also reported a high level of desire for additional CME, there exists a dichotomy between the responses for the perceived knowledge base and need for additional CME. Specifically, the nutrition topics identified as least comfortable knowledge base did not correlate with topics identified as a need for additional CME. While responders reported the lowest knowledge base in the topics of *nutritional aspects of special diets*, *nutritional support in non-GI disease*, and *sports nutrition*, these same three topics were among the five least important topics identified for additional CME. Furthermore, *sports nutrition* and *nutritional aspect of special diets* were also listed among the five least important topics for having additional resources. It is possible that the topics identified as important for additional CME are topics which pediatric gastroenterologists encounter more frequently in clinical practice. In this setting, the desire for additional CME may reflect the goal to stay abreast of issues important for clinical management. Another possibility is that the desire for additional CME is simply a reflection of the perpetual learning nature of medicine and respondent perceptions of inadequate knowledge may not directly correlate with functional knowledge base and knowing where to obtain the required information for patient directed care.

One topic that was identified both as desirable for additional CME and in need for additional resources was the topic of *nutritional requirements in specific GI disease*, which includes obesity. With two-thirds of respondents expressing interest in a postgraduate course on obesity, the respondents seem to recognize that management of obesity is becoming part of their clinical practice. There certainly exists a need for more comprehensive teaching on healthy diet and activity for all children, improved recognition of overweight and obesity and ongoing communication skills development³⁷. Childhood obesity is one of the most common conditions affecting children today and obesity related co-morbid conditions place additional burden on the health care system and suggests a need for improved nutritional care, raising the combined medical costs associated with treatment of these preventable diseases by an estimated \$48–66 billion per year^{5, 19, 38}. As more patients turn to their

physicians for nutrition counseling, there is a need to ensure that physicians are appropriately trained in the management of obesity and its co-morbidities.

In our data, we found an interesting dichotomy regarding the perception obesity management by pediatric gastroenterologists. While most respondents did not feel that pediatric gastroenterologists should play a main or leadership role in obesity management, most respondents also desired more education and resources on pediatric obesity, suggesting that pediatric gastroenterologists need additional training in obesity management and nutrition. It has been suggested that three factors are needed to promote physician management of obesity: 1) recognition of obesity as a medical problem, 2) willingness to provide interventions, and 3) adequate training and resources³⁹. Based on the survey responses as well as prior studies, it seems that healthcare workers identify obesity as a problem, recognize the need for additional education resources, and desire effective management solutions^{16, 40–42}. Physician training tools have been shown to be effective^{43–44} as physicians trained in an evidence-based obesity prevention/treatment tool displayed a willingness to implement these tools, which resulted in an increased counseling frequency⁴⁴. These successes suggests that physicians are overcoming the perceived lack of impact of nutrition counseling.

To address the growing need for physicians comfortable practicing nutrition medicine, physicians must first overcome self-imposed barriers to improving educational opportunities^{6–7}. Perceived barriers to curriculum development include a lack of space in the curriculum, few trained faculty, and insufficient educational materials¹³. To develop more effective CME, alternative teaching strategies should also be considered^{20, 29}, as an ongoing challenge is identifying a suitable format for teaching these topics. Prior studies have suggested that didactic lectures, the format of most CME programs, are not as conducive for adult learning compared to interactive, hands-on learning or self-directed learning^{45–46}. These feelings were somewhat reflected by the survey as the preferred educational format depended on the topic, but in general, a review course and web-based modules were the most preferred modalities.

Limitations of the studies include the overall response rate. While having a response rate of 15.2% may not reflect a representative sample of the entire NASPGHAN membership, the demographics of the respondents (63.2% in academia and 18.4% in private practice) were similar to what was reported in a 2003–2004 workforce survey (56% in academia and 23% in private practice)⁴⁷. Fellow responses represented 10.3% of the sample, which is similar to the NASPGHAN fellow representation of 14%. This similarity suggests that the survey respondents should reflect an accurate sampling of the pediatric gastroenterology population. By limiting the survey distribution to NASPGHAN members, it is possible that there is selection bias, but over 95% of pediatric gastroenterologists are members within NASPGHAN, again suggesting a reflective sampling. The possibility of population bias must also be considered as it is possible that physicians with a keen interest in nutrition may be more likely to respond.

Conclusion

There still exist deficiencies in nutritional knowledge and training for pediatric clinicians. Among pediatric gastroenterologists, there is a perceived need for additional exposure to nutrition topics. The format of this desired training depends on the topic with a review course and web-based modules being the most desirable formats for CME. With the nutrition challenges of today and a need for improved baseline knowledge in nutrition among fellows, the focus of nutrition should be at the fellowship level.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Physician Interest in Nutrition Topics: Percentage of physicians who rated the following nutrition topics as 'extremely important' or 'very important' for Desirable CME topics and who rated 'high priority' or 'moderate priority' for topics needing additional resources. Abbreviations: CME – continuing medical education, GI – gastrointestinal

Figure 2.
Role of GI Physician in Obesity Management

Table 1

Demographics of Survey Respondents

<u>Respondent</u>	<u>Number</u>	<u>Percentage</u>
Academic Physicians	172	63.2%
Private Physicians	50	18.4%
Other ^a	22	8.1%
Fellows	28	10.3%
Total	272	

^a Affiliation with industry, community clinic, children's hospital, or Health Maintenance Organization (HMO), or retired

Table 2

Physician Self-Assessment of Knowledge Base – The topics are sorted from the highest level of perceived knowledge base (excellent and above average) to the lowest level.

Nutrition Topic	Excellent	Above average	Average	Below average	Poor
Failure to thrive/growth failure	38.1%	43.3%	17.5%	1.1%	0.0%
Nutritional support in specific GI ^a disease	29.1%	45.5%	24.3%	1.1%	0.0%
Enteral nutrition support	27.5%	43.9%	25.3%	3.3%	0.0%
Parenteral nutrition support	27.2%	36.2%	32.8%	3.7%	0.0%
Refeeding syndrome	23.6%	37.3%	34.7%	4.4%	0.0%
Nutritional assessment	19.0%	39.8%	35.3%	5.2%	0.7%
Infant feeding	21.4%	35.4%	37.6%	5.2%	0.4%
Basic nutritional physiology	14.0%	36.9%	45.0%	3.3%	0.7%
Special feeding programs	14.1%	36.8%	37.2%	11.5%	0.4%
Micronutrient requirements	16.7%	32.0%	41.6%	9.3%	0.4%
Role of diet in development of chronic disease	13.9%	34.8%	41.9%	9.0%	0.4%
Nutritional aspects of special diets	8.9%	32.5%	44.3%	13.6%	0.7%
Nutritional support in non-GI disease	8.1%	32.2%	40.0%	18.5%	1.1%
Sports nutrition	3.4%	15.6%	39.5%	38.4%	3.0%

^a GI - gastrointestinal

Table 3

Interest in Postgraduate Course on Obesity

	Overall Interest	Fellow	Private practice	Academic
Very interested	28.7%	21%	36%	26%
Somewhat interested	38.2%	43%	36%	37%
Neutral	16.2%	21%	16%	16%
Not really interested	11.8%	14%	6%	15%
No interest at all	5.1%	0%	6%	6%

Table 4

Topics of interest in Obesity Postgraduate Course

Didactic Lecture Topic	% Interest
Pharmaceutical approaches to weight management	57.4%
Nutritional deficiencies in obesity	54%
Pharmaceutical approaches to hyperlipidemia	44.1%
When to refer to bariatric surgery	43.4%
How to counsel a family about nutrition	32.7%
How to set up a team approach	30.9%
How to handle psychosocial support for overweight patients	30.5%
How to get your hospital to support a multidisciplinary team	26.1%
Other	8.1%