

Prospective Study

Understanding academic clinicians' intent to treat pediatric obesity

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Abstract

AIM

To examine the extent to which the theory of planned behavior (TPB) predicts academic clinicians' intent to treat pediatric obesity.

METHODS

A multi-disciplinary panel iteratively devised a Likert scale survey based on the constructs of the TPB applied to a set of pediatric obesity themes. A cross-sectional electronic survey was then administered to academic clinicians at tertiary care centers across Canada from January to April 2012. Descriptive statistics were used to summarize demographic and item agreement data. A hierarchical linear regression analysis controlling for demographic variables was conducted to examine the extent to which the TPB subscales predicted intent to treat pediatric obesity.

RESULTS

A total of 198 physicians, surgeons, and allied health

professionals across Canada (British Columbia, Alberta, Manitoba, Saskatchewan, Nova Scotia, Ontario and Quebec) completed the survey. On step 1, demographic factors accounted for 7.4% of the variance in intent scores. Together in step 2, demographic variables and TPB subscales predicted 56.9% of the variance in a measure of the intent to treat pediatric obesity. Perceived behavioral control, that is, confidence in one's ability to manage pediatric obesity, and subjective norms, congruent with one's context of practice, were the most significant predictors of the intent to treat pediatric obesity. Attitudes and barriers did not predict the intent to treat pediatric obesity in this context.

CONCLUSION

Enhancing self-confidence in the ability to treat pediatric obesity and the existence of supportive treatment environments are important to increase clinicians' intent to treat pediatric obesity.

Key words: Pediatric obesity; Therapeutics; Intention; Decision Making; Behavior

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Core tip: Clinicians play an integral role in diagnosing and managing childhood obesity. This study examined how the theory of planned behavior (TPB) predicted academic clinicians' intent to treat pediatric obesity. Demographic variables and TPB subscales predicted 56.9% of the variance in intent scores amongst health professionals to treat pediatric obesity. One's practice context (subjective norms) and confidence in one's ability to manage pediatric obesity (perceived behavioral control) were the most significant predictors of intent. Attitudes and barriers did not predict intent. The TPB can be applied to strengthen clinical training programs targeted towards management of obesity in children.

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INTRODUCTION

Pediatric obesity is considered to be one of the greatest public health threats of the twenty-first century. In the last three decades, obesity amongst infants and young children has reached epidemic proportions^[1]. It is estimated that the total of 42 million children under the age of five who were overweight or obese as of 2013 will evolve into a magnitude of 70 million by 2025 if current trends persist^[2]. Presently, upper-middle income countries experience the highest prevalence of overweight children, yet rates are rising in all countries,

with the highest rate of growth in lower-middle income nations^[1].

The metabolic and physiological changes that accompany an increased body mass index are diverse and complex. Children who are classified as overweight and obese are not only at an increased risk of remaining overweight or obese as they progress into adulthood, but also face a range of medical sequelae including hyperlipidemia, hypertension, glucose intolerance, coronary heart disease, and psychosocial disorders^[3,4]. Obese children are more likely to experience an impaired quality of life, bearing not only a significant social and psychological burden, but also an increased risk of premature mortality^[5,6].

The obesity phenomenon is multifactorial and complex in its etiology and course. Governmental policies, community and family environments, and lifestyle all play a significant role in shaping the body mass index of infants and children. Particularly important actors in not only the management, but also the prevention of pediatric obesity, are healthcare professionals. They can identify children at high risk for becoming overweight or obese, engage children and their families in appropriate and vital interventions, as well as contribute to public health prevention efforts^[7]. In spite of the recent expansion in the availability of pediatric weight management programs and physicians' ability to connect patients with available community resources such as dietitians and physical activity counselling, the overall management of obesity by health care professionals is still sub-optimal^[8,9]. A large percentage of overweight and obese children remain clinically undiagnosed, suggesting that the window for early interventions is being missed and behavioral obesity-related risk factors are not being adequately screened for^[10-13].

Many clinicians feel they do not have the qualifications to treat obese patients and report a lack of adequate training to provide weight management counseling^[14]. Self-reported competence regarding obesity treatment has been consistently reported as poor^[15-17]. Experience with failure in managing patients' weight in the past is likely discouraging current clinicians from actively participating in obesity management^[17-19]. Given strong support amongst physicians for better counseling tools to guide patients toward lifestyle modification, there is a need for supplementary education and training in pediatric weight management to improve patient care^[14,19].

The decision of clinicians to engage in pediatric obesity management is influenced by a multitude of psychological factors, many of which are encapsulated within major theories of behavior. The theory of planned behavior (TPB) is one such model used extensively to predict human intent and behavior^[20]. It posits that attitudes, perceived behavior control, and subjective norms result in the formation of behavioral intentions that, in turn, serve as proximal causes of behavior. Attitudes are defined as expectations about an intervention's benefits

and effectiveness. Perceived behavior control refers to personal beliefs about one's own abilities, whereas subjective norms are considered to be the views of others with regard to a certain behavior and one's motivations to act in synchrony with these views^[20-22]. An individual's estimation of the costs of an action ("barriers") can additionally be utilized as a fourth subscale to strengthen the predictive ability of the TPB model^[22]. Intent, defined as a proxy of an individual's readiness to engage in a particular behavior, has been identified as the strongest correlate of actual behavior, and according to the TPB, is a cumulative function of four subscales: (1) attitudes; (2) subjective norms; (3) perceived behavioral control; and (4) barriers^[23]. The TPB has been recognized as an appropriate model for predicting the behavior of healthcare professionals^[23-26].

There is a compelling case for the treatment of pediatric obesity and strong evidence identifying intent as a proximal predictor of behavior. Understanding which dimensions within the TPB best predict the intent to treat would better inform strategies that would mobilize clinicians to engage in active pediatric obesity management. Such strategies may include educational programs and campaigns shifting clinical culture within academic institutions. Though past literature has examined the reported attitudes and competency levels of physicians towards obesity treatment^[15,18,27], to our knowledge, there has been no evidence addressing what factors play a significant role in influencing clinicians' intent to treat obesity within the pediatric population. There has been a call for research exploring the extent to which physician attitudes and health system factors are associated with clinical practice patterns of obesity care, as this information is important to catalyze effective health professional obesity diagnosis and management, and ultimately enhance health outcomes for children with obesity^[18,28].

The objective of this study was to determine the extent to which the TPB subscales (attitudes, subjective norms, perceived behavioral control, and barriers) predict variation in academic clinicians' intent to treat pediatric obesity. We hypothesized that all four aforementioned subscales significantly predict the intent of clinicians to treat pediatric obesity. This knowledge will be valuable in informing the design of more effective and innovative strategies to improve the care of infants and children with obesity.

MATERIALS AND METHODS

Setting and participants

This study was conducted at academic tertiary care centers affiliated with medical schools across Western Canada (British Columbia, Alberta, Manitoba, Saskatchewan), Eastern Canada (Nova Scotia), Ontario, and Quebec. We recruited health professionals affiliated with academic institutions as they are the ones involved in the training of the next generation of clinicians who will be treating pediatric patients.

Liaisons with the academic heads of pediatrics,

Table 1 Psychometric properties of the theory of planned behavior subscales

Subscales	No. of items	Cronbach's α
Attitudes	6	0.93
Subjective norms	6	0.76
Perceived behavioral control	10	0.87
Barriers	7	0.60
Intent	9	0.85

family medicine, and pediatric general surgery at 16 academic hospitals across the nation were established. Academic heads who agreed to participate in the survey then circulated the electronic survey link to all health professionals *via* email using their department mailing list. The survey was administered according to the Dillman method over a 4-mo period from January to April 2012^[28].

Study design

An electronic survey for this study was devised according to a framework specific to the creation of a TPB questionnaire^[29]. Themes that influence clinical decision-making with respect to obesity were identified in our previous qualitative study, in which 24 physicians from across Canada were interviewed^[30]. A multi-disciplinary panel consisting of a psychologist, pediatric endocrinologist, pediatric surgeon, and clinical epidemiologist iteratively then devised a Likert scale survey based on the constructs of the TPB applied to the identified pediatric obesity themes until consensus was reached. The final survey consisted of 38 items assessing the TPB constructs in relation to the management and treatment of pediatric obesity, and is available upon request. Intent and the 4 TPB constructs (attitudes, subjective norms, perceived behavioral control, and barriers) were assessed with 5-point Likert scale questions, where 1 was defined as strong disagreement and 5 indicated strong agreement. For example, when measuring intent, participants were presented with the starting phrase, "I would be willing to": And then asked to individually rate 9 items on the 5-point Likert scale. Data on participants' sex, age, birth, native language, education, practice setting, years of professional experience, and years of experience treating pediatric obesity were also collected. Basic psychometric properties of the survey are summarized in Table 1. All survey responses were anonymous; identifying information and IP addresses were not collected (Table 2).

This cross-sectional survey, administered as a sub-section of a larger questionnaire under the "ACT NOW" study, explored attitudes of clinicians towards obesity treatment through behavioral questions using a conjoint-based methodology^[31]. The entire questionnaire required approximately 30 min for completion, with the TPB questions located near the start of the survey and representing about one quarter of the entire question set. The study received ethics approval from the Hamilton Integrated Research Ethics Board (11-167). Informed consent was obtained prior to the start of the

Table 2 Agreement level for subscale items (*n* = 198)

	Percentage (%)				
	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Attitudes/benefits					
When obesity is managed or treated, children and adolescents will be less likely to develop:					
Diabetes	1.5	0.5	2.0	39.4	56.6
Cardiovascular disease	1.5	0.0	4.0	43.4	51.0
High blood pressure	1.5	0.5	3.0	44.9	50.0
Musculoskeletal problems	1.5	1.5	3.5	49.5	43.9
Elevated LDL cholesterol levels	2.0	1.5	9.1	52.0	35.4
Mental health problems	1.5	3.5	15.7	54.0	25.3
Subjective norms					
What would encourage you to manage or treat pediatric obesity?					
Patients requesting treatment	0.0	4.5	12.1	38.4	44.9
Parents requesting that a child or adolescent be treated	0.0	5.6	21.2	49.5	23.7
Clinical practice guidelines	0.0	3.5	15.2	58.1	23.2
Colleagues who found treatment was successful	0.0	3.5	24.7	55.6	16.2
Policies in your organization	0.5	10.1	36.4	42.4	10.6
Meta-analyses showing treatment was successful	0.0	2.5	8.1	52.5	36.9
Self-efficacy/barriers					
What would make it difficult for you to manage or treat pediatric obesity?					
Families do not support pediatric obesity treatment	2.0	16.7	19.7	40.4	21.2
Patients do not adhere to pediatric obesity treatments	0.0	7.6	18.2	53.5	20.7
I don't have enough expertise in the treatment of pediatric obesity	5.6	18.7	22.7	37.4	15.7
It would be hard to find the time	5.6	23.2	29.8	27.8	13.6
I don't have access to consultation regarding the treatment of pediatric obesity	8.6	32.8	22.7	30.8	5.1
Difficulty billing for pediatric obesity treatment	9.1	36.4	36.9	14.1	3.5
My colleagues would not support pediatric obesity treatment	15.2	42.4	27.3	13.1	2.0
Perceived behavioral control					
With respect to pediatric obesity, I have the skills to:					
Conduct an assessment	4.5	16.2	15.2	47.0	17.2
Estimate the risks associated with pediatric obesity	4.5	18.2	19.7	48.0	9.6
Counsel patients and families regarding treatment options	6.1	22.2	19.7	43.4	8.6
Deal with children and adolescents who do not adhere to treatment	10.1	36.4	18.7	29.3	5.6
Deal with families who do not support treatment	12.1	35.4	21.7	27.8	3.0
Provide psychosocial treatment	17.7	44.4	19.2	16.2	2.5
Provide long term treatment follow-up	16.2	24.2	18.7	35.4	5.6
Evaluate the usefulness of different approaches to treatment	7.6	26.3	22.7	38.9	4.5
Treat or manage obesity with medication	25.3	48.0	12.6	12.1	2.0
Provide surgical treatment	66.7	22.2	4.0	4.0	3.0
Intent					
I would be willing to:					
Refer a pediatric patient for obesity treatment	2.5	2.0	3.0	41.9	50.5
Assess obesity in children	7.1	10.6	8.1	50.5	23.7
Assess obesity in adolescents	6.1	9.6	11.1	48.5	24.7
Counsel families regarding obesity treatment options	7.1	11.6	13.6	52.5	15.2
Accept referrals of children and adolescents who have difficulty with obesity	23.2	25.3	14.1	25.3	12.1
Provide psychosocial treatments for obesity in adolescents	19.7	37.4	15.2	22.7	5.1
Provide psychosocial treatments for obesity in children	22.2	35.4	16.2	22.7	3.5
Treat obesity with medication	19.2	38.9	18.2	21.7	2.0
Provide surgical treatments for obesity	56.1	23.2	9.1	9.1	2.5

The order of questions within subscales was randomized in each survey. LDL: Low-density lipoprotein.

survey. Data were collected in a confidential password-protected database without personal identifiers.

Statistical analysis

Statistical analysis was conducted using SPSS v.20.0. Descriptive statistics were used to summarize demographic and item agreement data. Pearson correlations were computed to determine the magnitude of the associations between the TPB variables. Hierarchical linear regression analysis was conducted to examine the extent

to which the TPB subscales predicted the intent to manage pediatric obesity. To control for demographic variables, and to examine the relationship between demographic variables and the intent to treat pediatric obesity, we entered years of experience, birth country, and sex in step one of the hierarchical linear regression equation. The four TPB subscales were entered in step two. Participants who did not complete the entire survey were excluded from the analysis. *P*-values of less than 0.05 were considered significant. The statistical methods of this study were

Table 3 Demographic and practice characteristics of participants (n = 198)

Variable	n (%)
Sample Size	198 (100)
Gender	
Male	73 (37)
Female	125 (63)
Age	
26-35	38 (19)
36-55	127 (64)
≥ 56	33 (17)
Years of experience treating pediatric obesity	
0-5	119 (60)
6-15	48 (24)
≥ 16	31 (16)
Birth country	
Canada	131 (66)
Other country	67 (34)
First language	
English	158 (80)
French	23 (12)
Other	17 (9)
Educational background	
Allied health	11 (6)
Physician	149 (75)
Surgeon	38 (19)
Setting	
Walk-in/individual practice/community hospital	14 (7)
Group practice	19 (10)
University teaching hospital	165 (83)
Professional experience	
0-5 yr	43 (22)
6-15 yr	81 (41)
≥ 16 yr	74 (37)
Province	
West	52 (26)
Ontario	98 (50)
Quebec	19 (10)
East	29 (15)

reviewed by Dr. David Streiner from University of Toronto.

RESULTS

Of 341 participants who opened the survey, 291 consented to participate, and 198 completed the entire survey and were included in the analysis. This sample consisted of 149 physicians, 38 surgeons, and 11 allied health professionals (e.g., nurse practitioners, dieticians, etc.). Demographic characteristics of this sample are summarized in Table 3. A greater proportion of respondents were female (63%), worked as physicians (75%), and were employed in a teaching hospital setting (83%).

Survey results

The results of the survey regarding levels of agreement for each of the TPB subscales are illustrated in Table 2. There was strong agreement on benefits of obesity management and treatment. Over 75% of respondents either agreed or strongly agreed that obesity management would result in children being less likely to develop all listed co-morbidities (diabetes, cardiovascular disease,

high blood pressure, musculoskeletal problems, elevated LDL levels, and mental health problems). Agreement with subjective norms items was likewise high. The surveyed health professionals would be most notably encouraged to treat pediatric obesity if meta-analyses showed that treatment was successful (89%) and patients requested treatment (83%). A total of 72% reported an inclination to treat if they encountered colleagues who found treatment to be successful. A lack of patient adherence and family engagement were reported as the biggest barriers by 74% and 62% of respondents. Agreement on perceived behavioral control was low. A total of 62% respondents reported that they did not have the skills to provide psychosocial treatment, 73% did not know how to treat obesity with medication, and 48% reported not having skills to deal with families who did not support treatment. From an overall management perspective, 74% were willing to assess obesity in children, 73% were willing to assess obesity in adolescents, and 92% were willing to refer a pediatric patient for obesity treatment.

Predictors of intent

The correlations between demographic variables and TPB subscales are presented in Table 4. Length of experience was directly related to greater perceived behavioral control, fewer barriers, and a higher intent to treat pediatric obesity. The results of the full hierarchical linear regression analysis are summarized in Table 5. In step one of the equation, sex, birth country and years of experience treating pediatric obesity accounted for only 7.4% of the variance in intent scores [$F(3,194) = 6.29, P < 0.001, \text{adjusted } R^2 = 0.074$]. In step two, perceived behavioral control and subjective norms made significant independent contributions to the prediction of intent to treat pediatric obesity scores (Table 5). Although an increase in barriers was correlated with lower intent scores (Table 4), attitudes and barriers did not contribute independently to the prediction of intention to treat (Table 5). Sex, birth country, and years of experience treating pediatric obesity did not contribute independently to the prediction of intent to treat pediatric obesity scores in step 2 of the equation (Table 5). Together in step 2, the demographics of sex, birth country, and years of experience and TPB scores accounted for 56.9% of the variance in intent scores [$F(7,190) = 38.09, P < 0.001, \text{adjusted } R^2 = 0.569$]. The inclusion of a variable distinguishing surgeons ($n = 38$) vs a group ($n = 160$) including physicians ($n = 149$) and allied health professionals ($n = 11$) did not contribute significantly to the prediction of the intent to treat pediatric obesity at either steps 1 or 2 of the regression equation.

DISCUSSION

The World Health Organization has identified childhood obesity as a public health priority and has called for a collaborative strategy towards tackling the epidemic^[32,33].

Table 4 Pearson inter-correlation matrix between intent to treat pediatric obesity and demographic variables/theory of planned behavior subscales

Variable	Item mean	SD	Correlation coefficients						
			1	2	3	4	5	6	7
Sex	-	-							
Birth country	-	-	-0.1						
Experience	2.6	1.7	-0.05	-0.05					
Attitudes	4.3	0.7	-0.02	0.01	-0.05				
Subjective norms	4	0.5	0.23 ^b	-0.14	0.02	0.27 ^c			
Perceived behavioral control	2.8	0.7	-0.04	-0.01	0.36 ^c	0.02	0.08		
Barriers	3.2	0.6	0.08	-0.1	-0.19 ^b	0.02	0	-0.29 ^c	
Intent	3.1	0.8	0.11	-0.12	0.26 ^c	0.07	0.27 ^c	0.72 ^c	-0.27 ^c

Item mean is based on the average scores per question within each subscale (each question was anchored on a scale of 1 to 5). ^a $P < 0.05$, ^b $P < 0.01$, ^c $P < 0.001$. 1 = Less than 1 year, 2 = 1 to 5 years, 3 = 6 to 10 years, 4 = 11 to 15 years, 5 = 16 to 20 years, 6 = 21 to 25 years, 7 = More than 25 years. SD: Standard deviation.

Table 5 Step two of the hierarchical linear regression analysis for demographic factors and theory of planned behavior subscales on intent to treat ($n = 198$)

Independent variable	B	SE	β	P value
Sex	1.3	0.69	0.09	0.061
Birth country	-1.23	0.69	-0.09	0.077
Years of experience treating pediatric obesity	-0.04	0.21	-0.01	0.86
Attitudes	0.02	0.09	0.01	0.83
Subjective norms	0.38	0.11	0.17	0.001
Perceived behavioral control	0.65	0.05	0.69	< 0.001
Barriers	-0.15	0.09	-0.08	0.097

The P -value is based on the unstandardized regression coefficient. B: Unstandardized regression coefficient; β : Standardized regression coefficient. SE: Standard error.

Pediatric obesity is a multifactorial phenomenon, affected by genetics, family environments, diet and physical activity levels. By engaging in the diagnosis, active management, and prevention of pediatric obesity, clinicians can explore a wide range of treatment interventions with children and their families and subsequently alter the trajectory of a child's health^[34].

This study used the TPB framework to investigate the extent to which attitudes, subjective norms, perceived behavioral control, and barriers predicted Canadian academic tertiary care clinicians' intention to treat pediatric obesity. Coupled with demographic variables, the TPB subscales accounted for 56.9% of the variance in intent scores, a sizeable value strengthening the validity of this model in the context of pediatric obesity treatment^[35]. The study strongly supports the TPB accounting for a significant amount of variance in clinician intentions and is consistent with a previous systematic review, affirming the appropriateness of the TPB in predicting healthcare professional behavior^[23]. The strongest predictors of intent were subjective norms and perceived behavioral control. This suggests that, if one's practice context (*i.e.*, patient and family perspective, experience of colleagues, practice guidelines, and the evidence base) supports specific obesity interventions, and a personal belief in a clinician's own self-efficacy exists, a clinician is more likely to implement or refer a patient for treatment.

The relationship between perceived behavioral control and the intent to manage pediatric obesity was stronger than for any other TPB subscale. Over half of respondents reported lacking skills to provide psychosocial treatment and to manage obesity with medication. This finding is consistent with previous literature highlighting the self-perceived lack of proficiency in childhood obesity management, and reinforces the need for increasing training^[36]. Strengthened training programs for future healthcare professionals and enhanced continuing educational programs for existing professionals will augment their beliefs in their own abilities to implement obesity treatment, as suggested by the guidelines on how to promote evidence-based medicine^[37].

In addition to one's perceived confidence in their clinical abilities, subjective norms was likewise a significant predictor of the intent to treat pediatric obesity, with 72% of clinicians encouraged to manage or treat pediatric obesity if colleagues found treatment successful. This was supported by previous research affirming that subjective norms were strong predictors for physicians' use of clinical and organizational guidelines^[38-40]. Using different methods, our larger conjoint-based study likewise identified that social factors exerted a strong influence on obesity treatment decisions^[30]. We recommend that healthcare institutions support the management of pediatric obesity to enhance uptake of practice guidelines

and promote active management. This may include having local prominent clinical leaders mobilize their colleagues to engage in action. Physicians depend on their peers not only for knowledge exchange, but also for informal consultation to help guide their practice and develop clinical standards^[37]. Knowledge sharing amongst peers within institutions will thus have the potential to accelerate the adoption of clinical best practices and to promote increased treatment behavior in clinicians. The Knowledge-to-Action Cycle recognizes the importance of professional networks and suggests that opinion leaders and change agents be involved in the transfer of information to elicit change in the individual decision-making process^[36]. If the views of even a few colleagues become more proactive towards management, it is suggested by our data that surrounding clinicians will be influenced to act in a similar fashion.

Although attitude scores were high, with the majority of respondents agreeing that management of obesity likely results in reduced health consequences, the absence of a relationship between attitudes and the intent to treat pediatric obesity suggests that simply disseminating information regarding the effectiveness of evidence-based weight management strategies will not adequately influence the clinicians' intent to treat. Fostering skills that enhance perceived behavioral control and creating an enabling environment for obesity management is needed. Continuing professional education that focuses on knowledge translation is not likely to result in a sustained shift in the management of obesity, a finding echoed in past studies stating that the problem with childhood obesity treatment lies not in the elaboration of guidelines but rather in the lack of support systems for primary care practitioners to implement them, including inadequate training and resources^[16].

Our regression model concluded that although years of experience was correlated with perceived behavioral control, demographic variables overall did not account significantly for variance in clinicians' intention to treat childhood obesity. This result is supported by the literature, which demonstrates that attitudes exert a stronger influence on service preferences than demographic characteristics^[41,42]. This finding suggests that the diverse backgrounds of health professionals are not likely to present a major barrier to transforming the attitudes and actions of future clinicians treating pediatric obesity. Additionally, 60% of respondents reported having 0 to 5 years of experience treating pediatric obesity, suggesting that our findings reflect the intent characteristics of the newer generation of clinicians in academic centers who will go on to serve the pediatric population in the forthcoming years.

This study was not without limitations. The survey administered relied on clinicians' self-reports, which are prone to social desirability biases which might inflate the relationship between TPB subscales and intent to treat pediatric obesity^[43,44]. The Likert format on which the TPB scale was based has additional limitations (*e.g.*, ordinal

measurement, halo effects, and end aversion biases). Our sample was unbalanced amongst subspecialties, which may have led to a response bias in our results not reflecting all subspecialty populations. Since this study focused on clinicians within academic tertiary centers, the results may not be fully representative of health professionals' behaviors in community settings. The length of the survey, when coupled with the simultaneously administered discrete choice experiment, may have influenced the completion rate, however our sample size was adequate to power the analysis. Although participants who did not complete the entire survey were excluded from the analysis, given the inherent randomness amongst these participants, we do not believe this significantly affected our sample.

There were also several strengths to this study. The validity of the scale is reflected in the consistency of the study findings with our predictions and hypotheses. Another major strength of the study was its multiple stakeholder involvement. The heterogeneity of the sample makes our study findings generalizable to assorted health professionals and relevant to addressing pediatric obesity management across the spectrum of health professionals in light of the broad validity and applicability of the TPB^[25]. Although our sample contained an unequal proportion of subspecialties from various geographic regions, the diversity of our sample reflected the composition of the health teams responsible for pediatric care (physicians, surgeons, and allied health professions) and allowed for a broad understanding of academic clinicians' needs and preferences.

In conclusion, the TPB has been recognized as a validated model for predicting the behavior of healthcare professionals; however it had yet to be applied to the clinical management of pediatric obesity^[23,24]. This study demonstrates that the TPB can be valuable in understanding the factors that predict clinicians' treatment of the child with obesity. Academic clinicians' intention to treat childhood obesity is, to a large extent, influenced by their personal beliefs regarding their own ability to implement treatment and their practice context, which includes the views of patient and families, practice guidelines, evidence, and the experience of colleagues.

A knowledge and skill translation framework should be developed to improve childhood obesity treatment by increasing clinician self-efficacy and collegial support. Initiatives aimed at fostering clinical skill development and support for health professionals treating pediatric obesity may result in improved diagnosis, management and health outcomes of children with obesity. The TPB should be further investigated to affirm the relationship between subscale modifications and treatment behaviors of clinicians.

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design of the study, and acquisition of data, in addition to Ms. Stephanie Mielko who contributed to the acquisition and analysis of data. We would also like to thank Dr. David Streiner for his review of the statistical methods of this project.

COMMENTS

Background

Pediatric obesity is of significant public health concern globally. There is an urgent need for interventional strategies to curtail the significant physical, psychological, and social burden impacting children who are overweight and obese and their families alike. Around the world, clinicians hold the very integral role of diagnosing and managing pediatric obesity. The actual intent of clinicians to treat obesity amongst children, however, is a complex phenomenon.

Research frontiers

Though past literature has examined the reported attitudes and competency levels of physicians towards obesity treatment, there has been no evidence addressing what factors play a significant role in influencing clinicians' intent to treat obesity within the pediatric population. There has been a call for research exploring the extent to which physician attitudes and health system factors are associated with clinical practice patterns of obesity care.

Innovations and breakthroughs

Perceived behavioral control and subjective norms made significant independent contributions to the prediction of intent to treat pediatric obesity, while attitudes and barriers did not contribute independently to the prediction of intention to treat. Together, the demographics of sex, birth country, and years of experience and TPB scores accounted for 56.9% of the variance in intent scores.

Applications

Enhancing clinicians' skillsets to treat pediatric obesity and improving support from colleagues appear to be important to increasing a clinician's intent to treat pediatric obesity. Therefore, base training and continuing educational programs for health professionals should consider integrating improved instruction of practical treatment skills, and health center institutions should foster a clinical environment supportive of the management of pediatric obesity.

Terminology

The theory of planned behavior is a model used extensively to predict intent and, in turn, behavior. It is a cumulative function of four subscales: (1) attitudes toward the behavior; (2) subjective norms; (3) perceived behavioral control; and (4) barriers. Attitudes are defined as expectations about an intervention's benefits and effectiveness, subjective norms are considered to be the views of one's surroundings with regards to a certain behavior and one's motivations to act in synchrony with these views, perceived behavior control refers to personal beliefs about one's own abilities, and barriers are an individual's estimation of the costs of an action. Intent itself is defined as a proxy of an individual's readiness to engage in a particular behavior.

Peer-review

This paper is well-written and provides valuable findings regarding this field.

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