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CASE REPORT

Implementing the American Academy of Pediatrics 2023 Obesity Clinical Practice Guidelines in a Pediatric Residency Clinic

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ABSTRACT

The 2023 American Academy of Pediatrics Obesity Clinical Practice Guidelines offered the first guideline for the evaluation and management of pediatric overweight and obesity. This study aimed to create a protocol for a resident physician clinic associated with the local health department that aligns with the Clinical Practice Guidelines and is effective for a low-resource clinic, focusing specifically on intensive behavioral lifestyle treatment first as that is the framework of treatment, with pharmacotherapy and surgical options being secondary. The initial goal was to enroll 100 children and trend their body mass index (BMI) to determine if the interventions were beneficial. Due to poor recruitment and attendance, the study was aborted. Barriers to implementation included lack of resources and skilled personnel in the clinic as well as lackluster resident physician participation. It is imperative to evaluate potential barriers to enrollment and execution to successfully implement important guidelines like these in the future.

Introduction

Overweight and obesity is a global health epidemic. The number of individuals with overweight and obesity continues to increase each year and this shows no sign of improvement or even stabilization[1]. This is true in adults as well as children. The global economic burden of obesity and its sequelae, most significantly diabetes and cardiovascular disease, is a critical consideration for policy makers when allocating healthcare resources, developing prevention strategies, and setting priorities for funding public health initiatives. This manuscript focuses on a granular approach to managing pediatric obesity, it does not address macro-level solutions. Community-level treatment and prevention remain crucial, but it is essential that pediatricians are equipped with informed, evidence-based methods for evaluating and treating overweight and obesity. Although this manuscript emphasizes clinical management at the patient level, these efforts should ideally work in tandem with community-based prevention strategies to address pediatric obesity more effectively.

In 2023, the American Academy of Pediatrics (AAP) published the first Clinical Practice Guideline (CPG) for the evaluation and management of pediatric overweight and obesity, including recommendations for lifestyle modifications, pharmacotherapy, and surgical treatment[2]. This study attempted to implement a protocol for application of Intensive Behavioral Lifestyle Treatment (IBLT) based on these guidelines in a resident physician-run health department clinic, where most of the patients were of low socioeconomic status and thus also at an increased risk for obesity[3]. Notably, this study did not include pharmacologic therapies or surgical procedures in its algorithm. This decision was intentional, as establishing an effective IBLT protocol is considered the first step toward implementing a comprehensive treatment plan and aligned with the guidelines.

Methods

STUDY DESIGN

Initially, the intent of the study was to evaluate an implementation strategy while also gathering information about the clinical intervention's impact on outcomes, with the end points being percentage of visits for weight management attended (with the goal of 6 visits per year), body mass index (BMI) changes over one year, and behavioral and lifestyle modification impact on patients measured with a survey at the conclusion of the intervention. As discussed later, recruitment was difficult and retention poor, so the focus shifted to improving implementation at the practice.

PARTICIPANTS

Patients seen at Cedar Pediatrics, the Michigan State University (MSU) pediatric residency clinic located within the local health department in Lansing, MI, were recruited to the study between September 2024 and April 2025, when the study was terminated for low recruitment. Six patients and their parents consented to be a part of the study. Institutional review board (IRB) approval was obtained (University of Michigan Health-Sparrow IRB). There was no randomization of patients, as the goal of this study was to adopt the AAP Obesity Clinical Practice Guidelines and integrate evidence -based management of overweight and obesity into the community setting.

Patients were identified at their annual well child visits as eligible or non-eligible, based on the criteria listed below. Parents and patients signed informed consent and assent forms, respectively. The goal was to recruit 100 patients, only 4 patients were enrolled and none of them completed the number of visits initially planned (6).

ELIGIBILITY CRITERIA

- Children between the ages 8 years to 18 years with a BMI >=85%ile.

EXCLUSION CRITERIA

- Patients taking obesogenic medications
- Patients being treated for endocrine or metabolic diseases leading to obesity
- Patients receiving weight management counseling or treatment elsewhere

RESIDENT PHYSICIAN EDUCATION SESSIONS:

Two one-hour sessions describing the study aims, procedure for enrollment, description of the CPG, and method for delivering intensive behavioral lifestyle modification in the form of motivational interviewing was provided to the pediatric resident physicians during their weekly didactic sessions. A quiz was given at the beginning and the end of the presentation with questions

focusing on the details of the CPG that were deemed necessary for the outpatient pediatrician to know, mostly focusing on laboratory studies to order and when to repeat them. The quiz was given twice in the hope to improve knowledge and retention, with resident physicians seeing the questions again after learning the information.

INTERVENTION

The goal was to deliver six interventions over the course of one year. The clinical practice guideline recommends at least 26 contact hours per year, but this was expected to be quite challenging for our clinic, so six visits were planned over one year. Each visit would last 20-40 minutes; 20 minutes if it was just a visit with the resident physician and 40 minutes if there was an additional visit with the registered dietitian or one of the behavioral health specialists. During the first visit, the family filled out two questionnaires created for this project. The first, called the "habits Questionnaire" would help the resident physician quickly screen for opportunities for lifestyle changes, as it asked questions regarding eating, physical activity, sleep, screen time, as well as questions to assess for food and housing insecurity. At the end of this questionnaire, families were asked if there was one topic they were particularly interested in discussing. An associated "Healthy Habits: Phycian Guide" was provided to the resident physicians and served as a key to the patient survey, with recommendations for healthy choices that aligned with AAP guidelines. This was intended to improve workflow and ensure that accurate information was being delivered by each provider. The second questionnaire was a check list review of systems, which screened for common obesity comorbidities, such as obstructive sleep apnea, asthma, polycystic ovarian syndrome, anxiety, and depression.

The intervention delivered was in the form of motivational interviewing. Since this is a skill that each resident physician would have differing levels of experience, a "Habit Worksheet" was created for the resident physicians to discuss with the families. This instructed on the basic steps of motivational interviewing. A copy would be made for the family and a copy would be scanned into the patient chart. It asked for a specific and realistic goal, reasoning behind that choice, and asked families to think about changes they could make that would help them reach that goal. It asked them to rate how important and how confident they were in making that change on a scale of 1 to 10; 1 being not very, and 10 being very confident. It asked them to anticipate what part of the change would be difficult, and how to work around those problems. It then asked them to rate on a scale of 1 to 10 how ready they were to make the change. If they were not ready, the last section asked them to think about what steps they could take to get ready and write those steps down.

Initially, the clinic registered dietitian was to be involved in the interventions as the schedule allowed. Unfortunately, shortly after implementation, the registered dietitian position was eliminated from the clinic. There were two mental and behavioral health specialists who were also to be involved in the first few visits and were planning to follow the patients if comorbidities such as depression or anxiety were diagnosed, but due to budget cuts in the health department, one of these jobs was eliminated, limiting the amount of support provided for this project.

A documentation template was created prior to implementation. This would allow resident physicians to document each visit the same way, making continuity easier, as follow up with the same resident physician each time was a goal but not expected to be 100% feasible. Data collected from each visit is included in the results section. This data specifically was collected to help assess progress towards weight loss and decreased BMI as well as to determine patient risk for obesity comorbidities, as the presence of those risk factors directs when to repeat laboratory testing.

STATISTICAL ANALYSIS

Due to low recruitment, inferential statistics was impossible with the number of participants. There were four patients who presented for the initial intake visit, though there were several who signed the consent and assent forms, but did not show up on the day of the first appointment.

Results

Of the four patients recruited to the study, only patient number 2 returned for a follow-up and she did have improvement in her weight, BMI, as well as hemoglobin A1C, going from prediabetic range to the normal range for age. Each patient recruited was female, aged 10, 15, 15, and 17 yrs. Only patient 2 and patient 4 had a hemoglobin A1C drawn, and only patient 2 was in the prediabetic range. Patient 3 was hypertensive with a systolic blood pressure of 148 mmHg. Patient 4 was noted to have hypertriglyceridemia, with triglycerides of 134 mg/dl, though she was not prediabetic, with an A1C of 5.6% (normal less than 5.7%). None of the patients had known risk factors for type 2 diabetes and other than dyslipidemia for patient number 4, none of the patients reported risk factors for metabolic dysfunction-associated steatohepatitis.

Table 1. Patient characteristics, lab values, and identified risk factors for Type 2 Diabetes Mellitus (T2DM) and Metabolic dysfunction-Associated Steatohepatitis (MASH) in the patient cohort.

PATIENT 1							
Characteristics		***Labs***		***T2DM Risk Factors***		***MASH Risk Factors***	
Visit 1							
Gender	F	A1C	--	Family history of T2DM	Unknown	Male	No
Age	10	ALT	12	Gestational diabetes	No	Prediabetes or diabetes	Unknown
Systolic blood pressure	108	Total cholesterol	--	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	69	LDL	--	Dyslipidemia	Unknown	Dyslipidemia	Unknown
Weight (kg)	57.4	Triglycerides	--	Polycystic Ovarian Syndrome	No	Sibling with MASH	No
BMI	26	Non HDL cholesterol	--	Small for gestational age at birth	No		
				Obesogenic medications	No		
PATIENT 2							
Characteristics		***Labs***		***T2DM Risk Factors***		***MASH Risk Factors***	
Visit 1							
Gender	F	A1C	5.7	Family history of T2DM	None	Male	No
Age	17	ALT	18	Gestational diabetes	--	Prediabetes or diabetes	Yes
Systolic blood pressure	102	Total cholesterol	138	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	64	LDL	68	Dyslipidemia	No	Dyslipidemia	No
Weight (kg)	74.4	Triglycerides	38	Polycystic Ovarian Syndrome	No	Sibling with MASH	Unknown
BMI	28.7	Non HDL cholesterol	62	Small for gestational age at birth	No		
				Obesogenic medications	No		

Visit 2 (two months later)							
Gender	F	A1C	5.5	Family history of T2DM	None	Male	No
Age	17	ALT	--	Gestational diabetes	--	Prediabetes or diabetes	No
Systolic blood pressure	107	Total cholesterol	--	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	66	LDL	--	Dyslipidemia	No	Dyslipidemia	No
Weight (kg)	74.8	Triglycerides	--	Polycystic Ovarian Syndrome	No	Sibling with MASH	Unknown
BMI	28.7	Non HDL cholesterol	--	Small for gestational age at birth	No		
				Obesogenic medications	No		
Visit 3 (four months later)							
Gender	F	A1C	--	Family history of T2DM	None	Male	No
Age	17	ALT	--	Gestational diabetes	--	Prediabetes or diabetes	Yes
Systolic blood pressure	94	Total cholesterol	--	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	61	LDL	--	Dyslipidemia	No	Dyslipidemia	No
Weight (kg)	73.4	Triglycerides	--	Polycystic Ovarian Syndrome	No	Sibling with MASH	Unknown
BMI	27.8	Non HDL cholesterol	--	Small for gestational age at birth	No		
				Obesogenic medications	No		
Visit 4 (five months later)							
Gender	F	A1C	--	Family history of T2DM	None	Male	No
Age	17	ALT	--	Gestational diabetes	--	Prediabetes or diabetes	Yes
Systolic blood pressure	110	Total cholesterol	--	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	69	LDL	--	Dyslipidemia	No	Dyslipidemia	No
Weight (kg)	69.4	Triglycerides	--	Polycystic Ovarian Syndrome	No	Sibling with MASH	Unknown
BMI	26.2	Non HDL cholesterol	--	Small for gestational age at birth	No		
				Obesogenic medications	No		

PATIENT 3							
Characteristics		*Labs*		*T2DM Risk Factors*		*MASH Risk Factors*	
Visit 1							
Gender	F	A1C	--	Family history of T2DM	Unknown	Male	No
Age	15	ALT	12	Gestational diabetes	No	Prediabetes or diabetes	Unknown
Systolic blood pressure	148	Total cholesterol	171	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	82	LDL	99	Dyslipidemia	No	Dyslipidemia	No
Weight (kg)	80.5	Triglycerides	66	Polycystic Ovarian Syndrome	Unknown	Sibling with MASH	Unknown
BMI	33.52	Non HDL cholesterol	59	Small for gestational age at birth	No		
				Obesogenic medications	No		

PATIENT 4							
Characteristics		*Labs*		*T2DM Risk Factors*		*MASH Risk Factors*	
Visit 1							
Gender	F	A1C	5.6	Family history of T2DM	Unknown	Male	No
Age	15	ALT	11	Gestational diabetes	No	Prediabetes or diabetes	No
Systolic blood pressure	106	Total cholesterol	151	Hypertension	No	Obstructive sleep apnea	No
Diastolic blood pressure	66	LDL	88	Dyslipidemia	Yes	Dyslipidemia	Yes
Weight (kg)	76	Triglycerides	134	Polycystic Ovarian Syndrome	No	Sibling with MASH	Unknown
BMI	29.8	Non HDL cholesterol	--	Small for gestational age at birth	No		
				Obesogenic medications	No		

Discussion

KEY RESULTS

Due to poor recruitment and retention, the data collected were insufficient for statistical analysis, and only descriptive observations were reported. The lack of participation and follow-up may indicate problems with the study design and execution, or alternatively, reflect limited motivation among patients and families. One patient did have weight loss with associated improvement in A1C from prediabetic range to normal, but this patient did not follow the recommended intervals for follow-up and ended up dropping out of the study.

STUDY RELEVANCE

The AAP and United States Preventative Services Task Force (USPSTF) recommend treatment of pediatric overweight and obesity beginning with intensive behavioral lifestyle treatment and recommend a minimum of 26 contact hours over a 3 to 12 months period[2]. This has proven difficult to achieve in practice however, with several studies falling short of recruitment and retention goals, with the intended "treatment dose" of time not, being delivered[14]. In one such study by Rhee et al, a randomized trial, evaluated the addition of "parenting training" to family-based behavioral treatment. These were parent-child dyads who were treatment seeking, with 20% (14 of 70) of the control group and 30% (21 of 70) of the treatment group attending less than half of the planned twenty 1-hour sessions[5].

The Center for Disease Control (CDC) has several treatment programs they recommend that are prepared for immediate use and rapid implementation[6]. The SmartMoves dissemination study looked at 16 sites across the country that tried to implement SmartMoves, one of these recommended programs, and found that only four of sixteen surveyed sites sustained the program until the start of COVID-19; only one remained active during the pandemic. Barriers included funding, especially given the cost of the program and inability to bill insurance for visits, staffing requirements, misaligned expectations for what success looked like, and challenges with participation and recruitment[7]. Purchasing one of these CDC recommended treatment programs would be costly and difficult to implement, especially as our resources at the clinic continued to be diminished (losing the registered dietitian and losing one of the two behavioral health social workers). We attempted to create our own resources based on research that was implemented with our own protocol that aligned with the guidelines and that could be carried out primarily by the pediatricians and pediatric resident physicians, with some help from the remaining social worker.

There is some evidence that fewer contact hours can still be effective for the treatment of obesity[4,5]. Knowing the challenges that the population at Cedar Pediatrics would face, we decided to attempt just 6 contact hours over 12 months and then assess if the dose (number of contact hours) could be increased. Since overweight and obesity affect patients with lower socioeconomic status (SES) at a higher rate and knowing this clinic sees mostly an underserved population, it is valuable to determine what treatment options can be reasonably carried out in this environment to better align with the updated clinical practice guidelines[3].

COMPARISON TO SIMILAR STUDIES

This is likely the first study that attempted to implement a protocol to follow the obesity guidelines in a residency physician clinic with a focus on pediatric resident physicians providing much of the intervention. A study published in JAMA looked at implementing family-based behavioral treatment in the pediatric primary care setting and was found to be successful, however the intervention was not delivered by physicians[8]. Successful interventions typically have multidisciplinary support[9]. Additionally, the CPG recommends a structured exercise program and hands-on nutrition lessons[2]; none of which could be reasonably carried out in the resident physician clinics.

Motivational interviewing was emphasized in the resident education session as an important means of promoting lasting lifestyle changes, though this is a skill that develops over time, with most resident physicians being very new to its application. In comparison to other studies[10], the time spent teaching motivational interviewing skills was minimal. Motivational interviewing provided by registered dietitians could be an important aspect of successful IBLT, and further research into this could help policy makers and health departments prioritize this very important role in pediatric clinics[11]. This is especially relevant

to the current study as the health department eliminated the position for the registered dietitian dedicated to the pediatric office due to funding issues. However, a study done during the COVID-19 pandemic that had pediatricians as well as registered dietitians deliver motivational-interviewing sessions with overweight or obese youth did not show any improvement in the treatment over the control group[10].

Ours is not the first study to focus on children with low socioeconomic status; one of the potential barriers to participation is the need for transportation to a clinic for the intervention to be delivered. One study published in *Pediatrics* compared clinic-delivered vs home-delivered interventions. While the home-delivered interventions had improved attendance, there was no statically significant improvement in weight loss; this study was also heavily impacted by the COVID-19 pandemic[12]. Unfortunately, much of the recent literature attempting to study interventions for pediatric overweight and obesity have been negatively impacted by the onset of the COVID-19 pandemic, making it difficult to determine statistical significance in these studies. This, in addition to the direct negative impact the pandemic had on pediatric obesity[13], has muddied the waters in the application of treatment.

STRENGTHS, LIMITATIONS, GENERALIZABILITY

This study was both an attempt to measure the success of implementation of the clinical practice guidelines, with the intent to also measure the impact of following those guidelines on weight and BMI of participants. As has been previously described, this was largely unsuccessful due to the incredibly low number of families agreeing to the study as well as significant attrition. The pediatric population seen at this clinic almost exclusively relies on public health insurance and struggles with low socioeconomic status. For a sizable minority, English is a second language, so visits are conducted with the help of interpreters. For these reasons, this study is not an experience that can be generalizable to all pediatric clinics but possibly can be generalized to other safety net clinics or local health departments.

There are a few strengths of this study. Support material was created for this project which served helpful to motivated clinicians interested in trying to implement the clinical practice guidelines into their own practice, be that at an individual level or more broadly in their clinic. This material was distributed among the resident physicians as well as made a permanent resource in the clinic. This study also allows for further examination into the best way to support an underserved population, and could inspire improvement in the protocol to address population-specific needs (i.e., support for transportation or access to healthy food options).

There are many weaknesses. The first is the limited sample size. This is suspected to be due to multiple factors, one of which was poor "buy-in" by the resident physicians to recruit for the study and no additional clinical staff dedicated to enrollment. This clinic is already very busy with external pressure to see as many patients as possible, so resident physicians taking extra time to enroll the patients, was hardly feasible. Additionally, this is a topic not every resident is passionate about, likely limiting the number of patients offered the study as it was likely not discussed with every patient who met criteria. Organization was poor as well, and while the education sessions were held twice, resident physicians often did not feel confident in enrolling patients. Attending (supervisory) physician interest was low. Attrition was high, likely due to disorganized implementation of the intervention. The IRB approval process took approximately one year, which limited the timeframe for data collection, as residents who spearheaded the project were graduating and moving on before any meaningful data could be collected. Additionally, it has been difficult to recruit incoming resident physicians to continue the work that had been started.

Conclusion

Implementing and adhering to the AAP Clinical Practice Guideline for the treatment of overweight and obesity in children provides many challenges and opportunities for improvement. The main barriers to proper treatment with intensive behavioral lifestyle treatment in this study included low interest in the program (both patients and physicians) thus poor recruitment, with almost immediate attrition of the few patients who did participate, and a lack of resources in the health department clinic setting. Future directions for our residency physician group could include surveying patients and families to determine what barriers

were present for participation and improved resident physician education for better application of motivational interviewing. Future research should continue to highlight how pediatric obesity is a public health concern (obese children mean obese adults at risk for cardiovascular disease, stroke, cancer, and death) and emphasize that solving it on an individual basis is myopic; broader scale execution and implementation of these guidelines should be the goal. However, the general pediatrician must be aware of these guidelines and we all need to advocate for improved funding for implementing programs that have proven effective in the treatment of overweight and obesity. Placing value on the health of our children will lead to a healthier adult population.

Conflict of Interest Statement:

None.

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