

Child obesity research: literature review, design, sampling and identification

[Health & Medicine](#), [Childhood Obesity](#)



Childhood obesity is at an all-time high throughout the United States, and primary care offices should have a streamlined intervention on how to manage this disease. The purpose of this project is to analyze the literature to identify evidence-based approaches in for management and treatment of pediatric obesity in primary care, addressing the question “ In school-aged children, how does implementing a comprehensive multidisciplinary approach compare to care solely provided by the primary provider influence the child’s BMI within a year?”. The expected outcome of the evidence-based practice proposal will decrease the prevalence of obesity in school-aged children, also determine what is the best treatment to treat this epidemic and in turn increase life expectancy for the affected and lessen the economic burden on health insurance.

Research Literature Support

The PICOT question that was developed and being researched is, “ In school-aged children, how does implementing a comprehensive multidisciplinary approach compare to care solely provided by the primary provider influence the child’s BMI within a year?” Mameli *et al.* followed pediatric patients from the ages of 2-18 over the course of eleven years, from January 2006 to December 2016. Patients received treatment by a multidisciplinary team that included a pediatric endocrinologist, a dietician and a clinical psychologist. Every subject was screened at the baseline visit by the medical team and that included a medical exam and were measured by height and weight and applied the BMI score(Mameli et al., 2017). The research approach that was used in this study was a quantitative approach,

with nonprobability sampling, patients were referred by family physicians to participate in the study. Data was collected at follow-up visits, the patients and their family attended visits every month for 3 months and then every 2-4 months after, based on the clinician's judgment, until they normalized their BMI. Out of 453 patients, 392 were obese and 61 patients with overweight, attended at least 1 follow-up visit. About 80.8% of patients, reduced their BMI scores, 19.8% of patients went from obese to overweight, and 1.2% went from obese to normal weight. A strength of this study is the large number of children treated by the same multidisciplinary team. One limit that this study presented was weight loss intervention was established as a clinical program therefore, there was not a control group.

Sanders *et al.* examined the efficiency of a multidisciplinary program model, whose main goal is improving fitness and food label literacy in order to decrease the prevalence of obesity. This study included a multidisciplinary process using graduate-level students from various disciplines within a school of health sciences to directly deliver and train teachers to deliver programming. The students taught the specific programs; ABC for Fitness and Nutrition Detectives, to teachers and physical education teachers(Sanders et al., 2015). Participants were third-grade students attending four public schools in two Connecticut communities. The study used a mixed-methods design that used quantitative data to determine the effectiveness of the interventions and qualitative data to provide feedback from participants on program satisfaction. A combination of questionnaires and baseline fitness tests were used in order to collect data for this study,

also measures of height, weight and BMI scores were collected in one out of the two communities. Nutrition knowledge increased in the intervention group by 25.2%. Fitness measures in the intervention schools showed greater improvement than those in the controls for the physical activities that were tested. A strength of this study showed that partnering with outside institutions by using already established physical and nutritional educational programs, is an effective strategy to deliver health-related education (Sanders et al., 2015). A limitation of this study was that the study relied on classroom and physical education teachers to gather data and implement the programming, they did not always see the value in the research and often had conflict with scheduling programs around the preexisting curriculum (Sanders et al., 2015).

Butte *et al.* conducted a trial to determine comparative effectiveness of a one year community-centered weight management program against a primary care-centered program in low-income children. Participants were children from ages 2 to 12 years and had a BMI at or above the 85th percentile. The research design was a quantitative, randomized control trial in which participants were blindly randomized to the intervention or comparison arm using computerized randomization tables. Data was collected in YMCAs for the community-centered weight program by trained research staff and in primary care clinics for the primary care-centered program by clinicians. Primary and secondary outcomes that included BMI, blood pressure and psychosocial status were measured at baseline, 3 months, and 12 months. The community-centered weight program had

greater impact on BMI at 3 months in low-income, predominately Hispanic and black children, aged 6-8 years, than the primary care-centered program (Butte et al., 2017). The community-centered weight program had a borderline effect on BMI in children aged 9-12 years compared to the primary care-centered program (Butte et al., 2017). The community-centered weight program did not affect the BMI of preschool-aged children relative to primary care-centered program. Some improvement in secondary outcomes of blood pressure and psychosocial status was seen with both programs. One strength of this study was that researchers were able to recruit low-income, ethnically diverse children, the majority with a BMI above the 97th percentile, a group that presents a serious public health challenge and is often not represented in similar studies (Butte et al., 2017). Limitations of the study included barriers to participation, including scheduling conflicts, transportation difficulties, and communication and language challenges (Butte et al., 2017).

Jortberg *et al.*'s purpose of this study is to describe the implementation and results for the Fit Family Challenge (FFC). The FFC is a primary care-based childhood obesity intervention. Participants were children aged from 6-12 years with a BMI at or above the 85th percentile. Participation in the FFC involved; weekly contact and goal-setting with the child's primary care practice's designated FFC care manager, attendance at a monthly group visit with parents and a collection of weekly goals and monthly weight, height, blood pressure, and lifestyle factors. The research design was qualitative, facilitators used the group visit curriculum as a theme to implement FFC

interventions. Qualitative interviews were conducted using a semi-structured interview guide to collect data. The baseline BMI percentile was 97.1, systolic blood pressure, 106.0 mmHg, and diastolic blood pressure, 67.7 mmHg (Jortberg et al., 2016). For participants who completed at least 6 to 9 months of follow-up, the BMI percentile decreased significantly but the BMI score did not decrease for participants who completed only 3 to 6 months (Jortberg et al., 2016). A strength of this research was how the need to develop culturally appropriate childhood obesity interventions and strategies to engage families, showed up in this study. The biggest limitation in this study was the funders of this project requiring that all practices receive the intervention, so randomization was not possible (Jortberg et al., 2016).

Maggio *et al.* investigated changes in obese children and adolescents that were attending an obesity care center. There were 283 participants, with ages ranging from 3-17 years old, were followed for a minimum period of 6 months. Primary care providers used an integrative approach that included cognitive behavioral techniques such as psycho-education, behavioral awareness, and behavioral changes (Maggio et al., 2013). The research design was a quantitative longitudinal design, that used follow-up visits as a way to collect data. There was a significant decrease in BMI score in 49.5% of the patients (Maggio et al., 2013). One strength of this study was the large number of participants included in the study. The leading limitation of this study was the longitudinal design instead of a randomized controlled trial (Maggio et al., 2013).

Mazur *et al.* conducted a study to document and compare attitudes, skills, and practices in childhood obesity management between primary care providers in Poland, France, Italy, and Ukraine, which all have different obesity and overweight prevalence and health care systems. The research design utilized in this study was quantitative. Data was collected via a 26-question, self-administered questionnaire validated for length, clarity, and sustainability of the answers. The questionnaire contained basic questions on their opinions of childhood obesity. Participants responded to either closed-ended questions, or answered on a scale from 1-5, that later began with simple frequency counts. The study revealed that most of the primary health care providers were convinced of their critical role in obesity management but did not feel sufficiently competent to perform effectively (Mazur *et al.*, 2013). A strength of this study was that it emphasized the urgent need for developing health care structures to support adequate time and resources for evaluation of obesity during pediatric visits at the state/country level. The limitation of the study was a low percentage of respondents (32.4%), also the use of self-reported data is sometimes susceptible to bias (Mazur *et al.*, 2013).

In Staiano *et al.*'s study the objective of the study was to identify pediatric healthcare providers' current obesity and type 2 diabetes mellitus (T2DM) screening practices and the referral of behavioral interventions for the treatment of childhood obesity (2017). The research approach of this study was a qualitative design, data was collected through a 26 multiple-choice and open-ended question survey about the provider's current practices in

childhood obesity and T2DM screening. Out of fifty-seven providers that completed the questionnaire, five providers met at least four of seven clinical guidelines to refer patients with obesity, but no provider met all of the guidelines. A total of 88% of providers screened for obesity, 7% met guidelines for referring patients with obesity to weight management services. A strength of this study included responses from 17 areas that covered the major populated regions of the state of Louisiana, this is significant because the region is one of the most medically underserved, at-risk populations living in the United States (Staiano et al., 2017). One of the limitations of this study was out of 1,300 providers and affiliated stakeholders and a high number of website visits to the survey, only 10% of the contacted providers participated in the survey.

Busch, Hubka, and Lynch evaluated primary care providers on their knowledge and current practices regarding pediatric obesity. They also assessed a chart review before and after providing an educational program for primary care providers, focused on managing pediatric obesity. The research approach that was used was a combination of qualitative and quantitative. Both types of data were collected from the survey to describe the primary care providers' knowledge base and additional information. The survey had a 45% response rate, out of 96 providers only 44 responded. Lack of time and perception of parents, were identified as the most frequent provider barriers to pediatric obesity care (Busch, Hubka, & Lynch, 2018). A strength of this study was the design, all providers at the intervention site received the same education (Busch et al., 2018). A limitation of the study

was how limited the education session was, a one-time education session to providers may have not allowed enough exposure to the topic (Busch et al., 2018).

Robbins, Benson, Esangbedo, Ward, and Haden analyzed data from a sample of pediatric patients to determine the prevalence of obesity and how frequently weight fluctuated. The study population included 472 participants, had an average length of follow-up for 2.3 years, and an average of 3.9 visits. This is a retrospective, quantitative longitudinal cohort study. Data was collected from medical records from Philadelphia Health Centers. The prevalence of obesity was 25% at the beginning of the study and 24% after an average of 2.3 years follow-up (Robbins, Benson, Esangbedo, Ward, & Haden, 2016). Out of the 119 subjects who were obese at the beginning of the study, 29% were not obese at the end of the study. One strength of this study was its use of objective measures of height and weight and the analysis of weight status over time, with consistent measurement, researchers were able to collect quality data (Robbins et al., 2016). A limitation of this study was a substantial number of patients were lost to follow-up (Robbins et al., 2016).

Rhee, Kessler, Lindback, Littman, and El-Kareh examined the views of pediatric providers on conducting obesity management in the primary care setting, and identified potential care models that could simplify delivery of this care. A mixed methods approach was used as the research approach. Focus groups were first made among providers in San Diego County. A follow-up survey was then developed based on the focus group discussions and issued

among the larger group of pediatric providers in the area to evaluate their views on obesity management and solutions (Rhee, Kessler, Lindback, Littman, & El-Kareh, 2018). The results revealed only 23.8% of providers wanted to conduct behavioral management of obesity. The main strength of this research was the identified intervention, of implementing a team approach where a care manager or health coach supports patient/parent self-management behaviors, delivers brief behavioral interventions to improve health outcomes in pediatric obesity. A limitation of the study was the evaluations were conducted within one large pediatric primary care group in San Diego County. So, the responses and suggestions of this sample may not generalize to other populations.

Research Approach

The research approach to this evidence-based project that is most appropriate is quantitative because of how certain interventions will influence school-aged children's BMI scores, compared to different groups. Based on the criteria of quantitative research, like being able to provide numerical and measurable evidence, using statistical techniques that allow to determine the relationship between variables, it is the best research design for the selected evidence-based project (Tavakol & Sandars, 2014). More specifically, a non-experimental, descriptive research design will be implemented, this type of design aims to describe variables without any manipulation by the researcher (Tavakol & Sandars, 2014).

For the description of the design of this project it was determined that researchers will primarily observe how two different interventions; a multidisciplinary approach: that will include a nutritionist, psychologist, physical trainer, and a primary provider, or care solely provided by a primary provider, will influence children's BMI. Interviews and surveys will be the primary data collection methods. Interviews will be conducted by clinicians at the start of the project, middle and towards the end of the year. The interviews will take place at the patients' primary care provider's offices during well-child visits and other data will be collected such as the patient's height, weight, and BMI by trained clinicians and researchers. Surveys with close-ended questions will help researchers collect the data necessary to quantify results, it will be dispersed by email and participants identity will be kept confidential. Since this project's purpose is to observe how two variables; a multidisciplinary approach and care solely provided by the primary provider will influence children's BMI, the results can then be applied to simple descriptive statistics like frequency, mean, and mode to report the data collected. An advantage to descriptive research is that it can be a precursor to future research by identifying variables that can be further tested (Tavakol & Sandars, 2014). A disadvantage to this type of research design is that sometimes researchers can be biased. For example, the choice and wording of questions for the questionnaire may be influenced the bias of the researcher. The researcher may also make subjective choice about which information to record and emphasize in the findings.

Sampling

Childhood obesity, a class of health problems specific to children and adolescence, has been the cause of prominent alarm on health specialist's radars worldwide. In recent years, a need for more proactive strategies and campaigns to work against the now, fifth leading global risk factor of death has emerged (Pandita et al., 2015). Therefore, the target population of this evidence-based project is overweight or obese, school-age children, patients' ages will range from 5-18 years old and their BMI scores will be at or above the 85th percentile. So, nonprobability sampling will be utilized in this research design, more specifically convenience sampling. In non-probability sampling, not any member of the population can have a chance to participate in the study, and randomization is not possible to obtain a sample (Acharya, Prakash, Saxena, & Nigam, 2013). Sample size calculations have to consider the type of data being collected, funding, support facilities and the possibilities of dropouts throughout the study (Acharya et al., 2013). The sample will be attained from primary providers recommending patients for the study. A sample size of 300 patients, in each intervention group will include obese or overweight children with a BMI score at or above the 85th percentile, that are between the ages of 5-18 years old. Exclusion criteria will be children that have a normal BMI or below the 85th percentile, only made one well-visit throughout the study and/or children that have genetic syndromes that affect body weight, or endocrine disorders. An advantage to nonprobability sampling is that it can be cost-effective and time-effectiveness compared to other types of sampling methods (Acharya et al., 2013). One disadvantage is that there is an unknown proportion of the

population not included in the sample, consequently results are often hard to generalize to the entire population (Acharya et al., 2013). In order to protect patients' rights, the parents of patients will have to give consent in order for them to participate. Researchers will make assurances of confidentiality within the consent form with statements included like " All identifying characteristics such as names, city, ethnic background, will be changed". It is also fundamental that no harm must come to participants as a result of their participation in the study, under the principle of informed consent the participant will be fully apprised from any possible risks due to participation.

Proposed Implementation with a Change Model

The PDSA Change Model represents four phases; plan, do, study, and act. It is a process model that is used in the healthcare field for quality improvement, oftentimes working with clinical practice guidelines. The PDSA model is made up of small-scale test of planned actions, followed by an assessment and improvement of the initial plan (Coury et al., 2017). A successful application of this change model may enable clinicians to achieve their quality improvement goals, they otherwise would not have (Coury et al., 2017). This change model is the best for this evidence-based project because it allows researchers to test the interventions on a smaller scale, furthermore allowing for early and effective changes to the action plan, with minimum expenditure of resources.

During the plan phase researchers will plan to observe how two interventions; using a multidisciplinary approach or care solely provided by a primary provider, will influence school aged children's BMI. In the do phase, clinicians will observe and record the patients' progress throughout the year, all while keeping in mind changes that may help for future research studies. In the study phase, researchers will study the results, reflect on what was learned and what can be improved research process. In the act phase, researchers will record what was concluded from the project and how it can be spread across the practice. One barrier to overcome to the use of the results that might come from the evidence-based project is lack of time. Busy primary care providers will always say that they need more time in order to see and manage patients. A way to overcome this barrier is to educate providers on results from the study and answer any questions they may have. In order for a practice setting to foster an environment for evidence-based practice, there should be an organizational culture supported by all employees. To foster that culture, it is important for management to be supportive and inclusive of evidence-based practices.

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