



## RESEARCH ARTICLE

## A Text Message Intervention for Weight Management in Childhood Obesity at the Pediatric Office

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### Abstract

Childhood overweight and obesity is a major public health problem affecting one-third of children and adolescents in the United States, it has been linked to significant health risks and comorbid conditions in children and adults as it has direct associations with chronic health problems in children and adults not limited to diabetes, dyslipidemia, heart disease, non-alcoholic fatty liver disease, and many others. Childhood obesity is usually diagnosed and managed at the primary care office but having secondary prevention policy will have a bigger impact as obesity has been shown to be significantly correlated with observable behaviors, and having behavior change interventions will be easiest way to improve the health outcome. Sending a text message encouraging certain behavior changes to the parents of children ranging from 2 to 18 years of age with BMIs of more than the 95 percentiles for their age during their pediatric primary care visits. Sending a text messages weekly for 6 months encouraging certain behavior changes to the parents as SMS text can serve as cue to action according to the Health Belief Model (HBM) - which triggers the decision-making process to accept a recommended health action.

medication compliance and keeping appointments, and enhancing smoking cessation efforts and asthma control [1].

The specific primary aims of the program is reducing BMI scores by 10% among children ages 2-18 years coming to the pediatric office at Children Health Services identified as obese within 6 months. The second aim will be improving child screen time, physical activity, and food consumption measured by the Behavior Assessment Questionnaire (BAQ) among children ages 2-18 years coming to the pediatric office at Children Health Services identified as obese within 6 months.

This goal of reducing BMI and improving child screen time, physical activity, and food consumption behavior will be accomplished by sending text messages to the parents which to help with the decision-making process to accept a recommended health action.

The objectives of the program will be reducing BMI scores by 10% for 100 children coming to Children Health Service Clinic within 6 months period and conduct 10 cooking healthy classes for the family of children diagnosed with obesity coming to Children Health Service Clinic with the first 6 months. And for the Impact Objectives of the program participants will leave the Text Message Intervention program will have improved screen time to less than 2 hours a day, and participants will leave the Text Message Intervention program with ability and knowledge regarding cooking healthy meals at home and learn how they can fit that into their daily life. For the behavioral objectives of the program we will encourage the family to set and eat as family at the time of dinner, encourage the family to

### Goals and Specific Aims

The mission of this program is to improve the health of children through the prevention of obesity and its related complications. We can reduce the risk of diabetes, dyslipidemia, heart disease, non-alcoholic fatty liver disease, and many others that is associated with overweight and obesity.

This program is the first of its kind in the United States as a program that address childhood obesity by sending text messages. This method has been shown to be effective in improving diabetes outcomes, improving



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avoid using any electronic at the time of the dinner. The educational objectives of the program are to educate the family participating about the important of cooking healthy food, educate the teenager about the important of limit their screen time.

To measure the outcome of the aim to change will assess the BMI is assessed by age- and sex-specific percentiles as obesity is defined more having BMI more than 95<sup>th</sup> percentile for age according to the CDC in children ages 2 to 19 and by checking the by Behavior Assessment Questionnaire (BAQ).

## Background and Significance

Childhood overweight and obesity are highly prevalent in the United States, affecting one-third of children and adolescents [2]. It's an increasing health problem because of its strong association with chronic health problems in children and adults. In the United States, the percentage of children and adolescents affected by obesity has more than tripled since the 1970s. Data shows that nearly 1 in 5 school-aged children and teens in the United States have obesity [3].

While many factors interact to contribute to childhood overweight and obesity, obesogenic environments, genetic and individual factors, home influences, school environment, and community factors are among them [4]. Childhood obesity has been shown to be significantly correlated with observable behaviors, including increased screen time [5], poor diet [6], and a lack of exercise [7].

The estimated annual health care costs of obesity-related illnesses are \$190.2 billion, or nearly 21% of annual medical spending in the United States [8]. Childhood obesity alone is responsible for \$14 billion in direct medical costs. Obesity-related medical costs in general are expected to rise significantly, especially because today's obese children are likely to become tomorrow's obese adults. If obesity rates were to remain at 2010 levels, the projected savings for medical expenditures would be \$549.5 billion over the next two decades [9].

Childhood obesity is a public health problem linked with significant health risks and comorbid conditions in children and adults as it has direct associations with chronic health problems in children and adults, not limited to diabetes, dyslipidemia, heart disease, non-alcoholic fatty liver disease, and many others. Obesity during childhood commonly persists into adulthood and is usually resistant to interventions that involve recommendations to decrease caloric intake or to increase caloric expenditure through increased physical activity. Scientists and medical professionals have found that the easiest way to improve a health outcome is to have a health behavior change. In 2003, the US Preventive Services Task Force (2003) recommended that primary care practitioners (PCPs) screen for

obesity and offer behavioral interventions and intensive counseling for those identified as being obese.

Behavior change interventions for weight loss are multifaceted and usually include a variety of techniques. But the great challenge is that the average person in the U.S. spends only an hour per year in direct medical contact, whereas they spend thousands of hours making decisions about their health [10]. For that reason, it was found that computerized health promotion such as the internet, email, and SMS offer an enticing alternative way to help individuals with health behaviors [11].

## Needs Assessment Plan

The proposed program involves sending a text message encouraging certain behavior changes to the parents of identified children with childhood obesity during their pediatric primary care visits. The target population includes children ranging from 0 to 18 years of age with BMIs of more than the 95 percentiles for their age.

To obtain lasting results, a needs assessment for the pediatric office's clients will be completed. As childhood obesity is undoubtedly multifactorial in origin, we need an ecological framework that addresses an individual's environment to be able to address the complexity and multidimensional problem of childhood obesity. For measuring lifestyle behaviors among children with obesity, we will use the Behavior Assessment Questionnaire (BAQ), which is a questionnaire that was developed using existing literature. The questionnaire score yielded good reliability for using the instrument as an index of lifestyle behaviors, and it discriminated between known groups of children with obesity and a child population sample. Its analysis for the Screen Time and Physical Activity components was marginally supported, and although the Food Consumption dimension did not meet the minimum acceptable reliability values for sub-scale use, it may be of use for further exploratory analysis [12].

We can use the Systematic Screening and Assessment Method to screen patients' parents in the clinical setting for what they think about the most contributing factors to the patient's obesity.

We also to collect information about the collect individual demographic information like the children age, race, number of children in the same family, age at birth of first child, and marital status of the parents as well as some health-related behavior about the parents to check about their current smoking status, level of education and self-reported health. We need also gather information about their *socioeconomic status and the neighborhood characteristics they are live in*.

Its important to gather such information *neighborhood characteristics they are live in* as the we know that childhood obesity is more prominent

in urban than rural areas (21.3% vs. 12.5%) and also the information about the mother work status is also important as the childhood obesity as found to be higher among housewives (22.8%) than among working mothers (16%,  $p < 0.016$ ) [13].

Also, the child age and the parent age are very important information that have be included as the child BMI had significant positive correlations with the child age, parental ages [13].

This information will be gathered by more than one method, the first is to conduct personal interview, although this might be a time-consuming method but the information that be gather will be more specific and detailed as siting face-to-face with the family and record his response give us more accurate and details information. The second method will be telephone interview as in this method we will be as able to ask some relevant questions from the family over the telephone, its less time consuming and a less expensive method. The last will be through questionnaire that will be mailed to the family, as we can list the questions and mailed them to the families, they can have more time to respond and send it back to us through mail or even in person.

The goal of the program will be to reduce childhood obesity. The Text Message Intervention for Weight Management in Childhood Obesity in the Pediatric Office Program is the best available solution, especially by using text messages. The use of mobile devices to provide public health interventions and medical care has been established, as text messages have been shown to be effective in improving diabetes outcomes, improving medication compliance and keeping appointments, and enhancing smoking cessation efforts and asthma control [1]. It has not been widely tested in low-income, resource-poor populations and is largely untested in Spanish-speaking populations. Using text messaging services to encourage healthy behaviors in children who are obese is a good idea.

### Theoretical grounding

This program will work from a Harm Reduction approach especially for people who already have been diagnosed with childhood obesity with a goal to decrease any complication associated with obesity to minimize the harm. This is a secondary prevention approach; this theory will recognize also the family who might not be convinced that their children have any medical problem we are going to use a second grounding theory which is trans-Theoretical Model (TTM) by changing the family member precontemplation to contemplation state with the hope that they are going to finally progress through the stages of change.

In this study we are going to use secondary prevention where we will be able to identify the childhood obesity an earlier stage before causing any problems. At the

same time also would consider that as a tertiary as well that also can help people who are ready been having some complication like hyperbilirubinemia or diabetes would benefits to decrease that kind of complication.

We have identified two EBP, the first one is the High Five for Kids. This program was designed to improve the eating habits in children aged 2-6 with aim to reduce obesity, this program focusing on primary care obesity management intervention for both the parents and their overweight children that include seven motivational interviewing counseling sessions and three telephone follow-up calls, this is done by a pediatric nurse practitioner, also parents and their children were given numerous resources to assist with decision support and patient tracking. According to the study, it showed that there was lower in the increase of body mass index (BMI) and a decrease in daily television and video viewing time among the target patient population [14].

This program has a lot of similarity with my project as its primary care-based in obesity management intervention for both the parents and their overweight children, as my project involves sending SMS text message while this program involved having phone calls reminders. I do believe that I can consider applying some changes in my program and consider having counseling if the resources where available.

The second EBP was the New Moves program. This program was designed with aim to improve the eating habits and encourage increasing physical activity to reduce obesity among teenage girls mainly between 11-18 years-old, this program is considered a school-based intervention by providing girls-only physical education classes, which includes 8 nutrition and 8 social support lessons, as well as providing individual counseling sessions, and maintenance activities. The result was promising as it showed a decrease in sedentary activity and more important it's also showed a change in unhealthy weight control behaviors with increases in portion control, body satisfaction and self-efficacy for physical activity [15].

I do believe this program is very promising one as it was a challenge to address this patient population especially teenage girl 11-18 years. The nice thing about this program that it was able to have a behavior changes among the target population by providing counselling services. This is common target I am trying to achieve from my program and defiantly I might able to implement some changes especially while addressing the teenage girl population. Those changes might be increase counseling and social support lessons.

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