

Qualitative Research on Facilitators and Barriers to Childhood
Obesity Prevention and Control:

Experiences from the implementation of the Massachusetts
Childhood Obesity Research Demonstration project

vorgelegt von
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von der Fakultät VII – Wirtschaft und Management
der Technischen Universität Berlin
zur Erlangung des akademischen Grades

Doktor der Gesundheitswissenschaften/Public Health
- Dr.-P.H. -

genehmigte Dissertation

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Tag der wissenschaftlichen Aussprache: 29. Mai 2017

Berlin 2018

Acknowledgement and Foreword

Acknowledgement

I would like to use this opportunity to thank my two advisors during the process of this dissertation. First, I would like to thank my advisor, Prof. Dr. Ulrike Maschewsky-Schneider at Technical University of Berlin and Berlin School of Public Health, Berlin, Germany. She was already my advisor during my Master thesis at Berlin School of Public Health. Her guidance during that process made me realize that I would like to do a PhD with her as supervisor. Second, I would like to thank Prof. Dr. Kirsten K. Davison, my advisor at Harvard T.H. Chan School of Public Health, Boston, USA. Without her support and supervision, this dissertation would not have been possible.

Furthermore, I would like to thank my colleagues at Harvard T.H. Chan School of Public Health and at the Massachusetts Department of Public Health in Boston. They believed in my work, trusted me, and gave me the opportunity to work on different projects.

Especially, I would like to thank my husband, Markus Ganter, my family, and Alyssa Aftosmes-Tobio. Their encouragement and support made the process of working on this dissertation a little easier and made me see light at the end of the tunnel.

Foreword

This dissertation is based on collaboration between Technical University of Berlin, Berlin, Germany and Harvard T.H. Chan School of Public Health (HSPH), Boston, USA. I was an external student at Technical University of Berlin and conducted the work for this dissertation at HSPH.

I contacted Prof. Dr. Kirsten K. Davison in January 2012 and started working as a research assistant at HSPH in September 2012. In December the same year I got promoted to a project manager for the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) study. The implementation of this project started in September 2012 in Massachusetts. My advisor Prof. Dr. Kirsten K. Davison oversaw all my work at HSPH. My work included supervising students and working on several other projects with my advisor and colleagues. The MA-CORD project was overseen by the Centers for Disease Control and Prevention (CDC), which also funded the study, and the Massachusetts Department of Public Health (MDPH). Due to this collaboration, I was able to meet colleagues from these institutions for regular meetings and at conferences. All work we conducted in Massachusetts was discussed and reviewed by the CDC and the MDPH.

Within the MA-CORD project, I developed interview questionnaires, contacted stakeholders, conducted interviews with these stakeholders, transcribed interviews, managed the transcription of interviews with a professional company, analyzed interviews, summarized the results, published results in peer-reviewed journals, helped with the implementation process in the school sector, conducted surveys as online and as paper versions, collected data, cleaned data, was co-author on other publications, conducted meetings and trainings, and presented project results at international conferences.

Zusammenfassung

Hintergrund

Adipositas bei Kindern und Jugendlichen ist noch immer ein globales Problem und betrifft neben den einzelnen Betroffenen auch deren Familien, Gemeinden und die Gesellschaft. Daher befürworten und führen immer mehr Entscheidungsträger und Wissenschaftler multidisziplinäre Interventionen durch. Wichtig hierbei ist, dass auch die Eltern der betroffenen Kinder adressiert werden, da sie einen großen Einfluss auf das Verhalten ihrer Kinder haben. Zudem stoßen Eltern aus niedrigeren sozialen Schichten häufig auf Probleme und Barrieren, um einen gesunden Lebensstil zu führen. Derzeit ist wenig darüber bekannt, wie viel Kenntnis die Akteure in den Lebensräumen der betroffenen Familien über diese Probleme haben und wie bewusst sie sich über die Adipositasprävalenz bei Kindern und Jugendlichen sind. Darüber hinaus gibt es wenig Informationen über Erfolge und Schwierigkeiten bei der Implementation einer Intervention, die auf verschiedenen Ebenen und in verschiedenen Sektoren gleichzeitig implementiert wird. Folglich fokussiert sich diese Dissertation auf die Identifikation von Erfolgen und Hürden ausgehend vom Wissen und den Erfahrungen der Akteure bei der Implementierung eines Adipositaspräventionsprogramm für Kinder und Jugendliche.

Methodik

Diese Dissertation mit ihren drei Publikationen ist Teil des Massachusetts Obesity Research Demonstration (MA-CORD) Projektes. Von 2012 bis 2014 wurden 78 Interviews mit Entscheidungsträgern durchgeführt. Diese Entscheidungsträger waren in den folgenden Bereichen aktiv: Nachmittagsbetreuung, Schule, das ‘Special Supplemental Nutrition Program for Women, Infants, and Children’, Kinderkliniken, Kindertagesstätten, das ‘Parks and Recreational Department’ und Programmkoordinatoren. Interviews fanden persönlich oder telefonisch statt. Alle Interviews wurden mit einem Audiorekorder aufgezeichnet, transkribiert, kodiert und analysiert.

Ergebnisse

Unter Nutzung des ‘Family Ecological Models’ haben Akteure aus allen Lebensbereichen ähnliche Barrieren und Probleme genannt, die Eltern daran hindern an Programmen zur Prävention von Kinderadipositas teilzunehmen. Fast alle Akteure haben Mängel in der Kinderadipositasprävention identifiziert. Diese sind zum Beispiel fehlende

Bestimmungen und Regeln, um mehr Bewegung und eine gesündere Ernährung für die Kinder zu ermöglichen. Zudem wünschten sich die Akteure mehr Möglichkeiten zur Kommunikation und Zusammenarbeit innerhalb ihrer Institution und innerhalb der Gemeinde. Akteure, die an den Folgeinterviews teilgenommen haben, haben verschiedene Erfolge und Lehren bei der Implementierung von MA-CORD genannt, zum Beispiel ein höheres Interesse betroffener Eltern an Präventionsprogrammen und bessere und mehr Möglichkeiten der Kommunikation während der Programmimplementierung.

Schlussfolgerung

Das Wissen und die Erfahrung der Akteure um die Probleme und Barrieren, auf die Familien mit geringerem sozialen Status stoßen, können eine gute Basis zur Zusammenarbeit zwischen diesen Akteuren und Wissenschaftlern bei der Implementation von multidisziplinären Interventionen darstellen. Die Ergebnisse der drei Studien zeigen wie wichtig das Wissen der Akteure über die eigene Gemeinde, und über wichtige Fragen bei der Planung und Durchführung solcher vielfältigen Interventionsstudien wie MA-CORD ist.

Abstract

Background

Childhood obesity as a major public health concern affects individuals, families, communities, and societies. Therefore, an increasing number of policy makers and researchers suggest and conduct multidisciplinary interventions, which also address parents, since they are gatekeeper when it comes to healthy behaviors. However low-income families often do not have the means to live a healthy lifestyle, but community stakeholders, who are greatly involved with families and their children, can influence parents' choices. Yet, little is known to what extent stakeholders are aware about barriers families in low-income communities face, and their awareness about the increase of childhood obesity. Furthermore, little is known about successes and lessons learned when implementing multisector, multilevel interventions. To address these gaps, this dissertation focused on stakeholders' knowledge and experiences with childhood obesity prevention efforts.

Methods

All three studies were nested within the multidisciplinary Massachusetts Childhood Obesity Research Demonstration (MA-CORD) project. We conducted 78 interviews from 2012 through 2014. Stakeholders represented the following sectors: afterschool, school, the Special Supplemental Nutrition Program for Women, Infants, and Children, primary healthcare, early care and education, the Parks and Recreational Department, and program coordinators. Interviews were conducted in person or over the phone. All interviews were audio recorded, transcribed, coded, and summarized.

Results

Using the Family Ecological Model, stakeholders across sectors identified similar barriers parents experience within childhood obesity prevention. Nearly all stakeholders identified gaps in childhood obesity prevention efforts. Which are, for example, policy changes to increase physical activity and a healthier nutrition. Stakeholders also asked for more communication and collaboration opportunities within their organization and the community. Stakeholders interviewed at the second time point identified multiple successes and lessons learned when implementing MA-CORD, for example an increase in parent engagement in obesity prevention efforts and lack of communication opportunities.

Conclusion

Stakeholders' knowledge about barriers for low-income parents to participate in childhood obesity prevention illustrates potential for good collaborations between stakeholders and researchers when implementing multidisciplinary interventions. The results of these three studies have shown the importance of stakeholders' knowledge about the community they live in and about key issues to consider when planning and implementing multidisciplinary interventions such as MA-CORD.

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List of Abbreviations

BMI	Body mass index
CDC	Centers for Disease Control and Prevention
CORD	Childhood Obesity Research Demonstration
DEGS	Studie zur Gesundheit Erwachsener in Deutschland
FEM	Family Ecological Model
MA-CORD	Massachusetts Childhood Obesity Research Demonstration
NAP SACC	Nutrition and Physical Activity Self Assessment for Child Care
NIH	National Institutes of Health
RKI	Robert Koch Institut
TV	Television
USA	United States of America
U.S.	United States of America
WHO	World Health Organization
WIC	The Special Supplemental Nutrition Program for Women, Infants, and Children

1 Introduction

1.1 Definition of Public Health

“Public Health connects us all.” [CDC Foundation 2016].

Public health is a research field that addresses the prevention of disease and the improvement of health of populations by promoting healthy lifestyles and preventing and controlling both infectious and noncommunicable diseases. Unlike the field of medicine, public health focuses on whole populations rather than individuals. These populations can be as small as neighborhoods and communities, or as big as entire countries [CDC Foundation 2016]. The main functions of public health are the identification of health problems and/or trends in disease, the development of public policies to address those identified health issues and trends, and assuring that all populations have access to health care [WHO 2016]. C.E.A. Winslow defined “Public Health” in 1920 as follows:

“[Public Health] is the science and arts of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organisation of medical and nursing service for the early diagnosis and preventative treatment of disease, and the development of social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health.” [Winslow 1920].

In addition, Dr. Paul E. Farmer summarized the importance of public and global health as follows:

“The essence of global health equity is the idea that something so precious as health might be viewed as a right.” Dr. Paul E. Farmer¹

¹ Dr. Paul E. Farmer is a physician and anthropologist, co-founder of Partners in Health, chair of the Department of Global Health and Social Medicine at Harvard Medical School, chief of the Division of Global Health Equity at Brigham and Women’s Hospital in Boston. He also is a United Nation Special Adviser to the Secretary-General on Community-based Medicine and Lessons from Haiti.

1.2 The Importance of Public Health in Childhood Obesity Prevention

Childhood obesity remains a persisting and widespread public health concern [Ogden 2014]. To successfully address childhood obesity, it is crucial to implement intervention strategies within entire population groups. As C.E.A. Winslow highlighted, it is furthermore important that these interventions occur in multiple settings and employ multiple strategies [Winslow 1920]. Successful strategies should also incorporate policy support, multisector engagement, transparency, monitoring, evaluation, and environmental change [WHO 2012a].

Public health aims to protect populations when making lifestyle choices. Though many factors such as diet and physical activity influence the risk of diseases, for example obesity, cancer, and heart disease. These factors are influenced by individual behaviors. Yet, these behaviors are often misunderstood, since it is implied that everyone can actively make their own choice despite outside circumstances. But choices are often heavily influenced by others, such as food industry, government, or environmental, socioeconomic, and genetic factors. Other external factors that influence consumer choices are food advertisements to children and families by the food industry, portion sizes in restaurants, and nutrition labeling [WHO 2008]. Public health therefore targets to help families and children live a healthier lifestyle and to change local environments to facilitate these lifestyles.

1.2.1 The Prevalence of Childhood Obesity

In the United States of America (U.S.), the prevalence of obesity in children and adolescents aged 2-19 years remains high at 16.9% [Ogden 2014]. Although researchers have studied the issue of obesity and childhood obesity for decades, the obesity rate has only significantly decreased among preschoolers in the U.S. [Ogden 2014]. In Germany, the prevalence of childhood overweight and obesity is lower, with 15% of children and adolescents aged 3-17 years being overweight, including 6.3% being obese [Kurth et al. 2007]. Various studies have reported a downward trend in overweight and obesity in children aged 4-7.9 years and a plateau among children aged 8-16 years [Blüher et al. 2011, Moss et al. 2012].

It is worth noting that the U.S. and Germany use different cut-offs when defining childhood overweight and obesity. The Centers for Disease Control and Prevention (CDC) in the U.S. define childhood overweight as having a body mass index (BMI) \geq 85th percentile, and childhood obesity as having a BMI \geq 95th percentile [CDC 2015a]. In Germany, children

are categorized as overweight with a BMI $\geq 90^{\text{th}}$ percentile and obese with a BMI $\geq 97^{\text{th}}$ percentile [Kurth et al. 2007]. The World Health Organization (WHO) uses yet another definition of childhood overweight and obesity; among children and adolescents ages 5 to 19 years, the organization defines overweight with a BMI > one standard deviation above the WHO growth standard median and obesity with a BMI > two standard deviations above the WHO growth standard median [DeOnis 2007].

In both countries, the U.S. and Germany, the prevalence of overweight and obesity in adults remains high. Adult overweight and obesity are defined by BMI, which is calculated as weight in kilograms divided by height in meters squared. An adult with a BMI between 25 – 29.9 is defined as being overweight, and a BMI ≥ 30 is defined as being obese [CDC 2015b]. In the U.S., 33.1% of adults are overweight and 35.7% are obese [NIH 2012a, Ogden 2012]. See Figure 1 for time trends in obesity among U.S. adults.

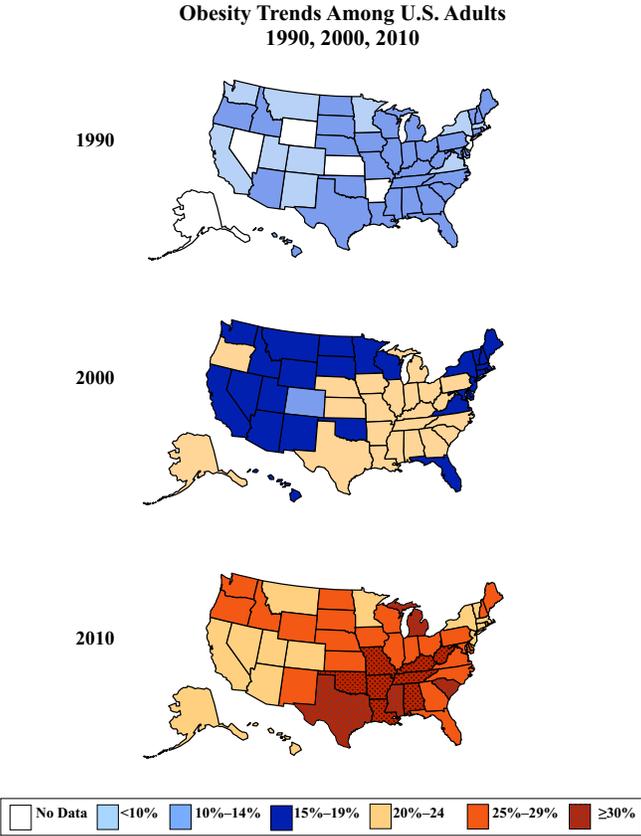


Figure 1: Trends in obesity among U.S. adults, 1990-2010, Behavioral Risk Factor Surveillance System, CDC [CDC 2015e]

In Germany, the prevalence of overweight and obesity in adults is 36% and 24% respectively [Mensink et al. 2013]. Since the development of overweight and obesity during childhood often leads to overweight and obesity in adulthood, it is best prevented and controlled earlier in life [Freedman et al. 2001, Freedman et al. 2005]. See Figure 2 for obesity trends among German adults.

**Obesity Trends Among German Adults
1990 - 2011**

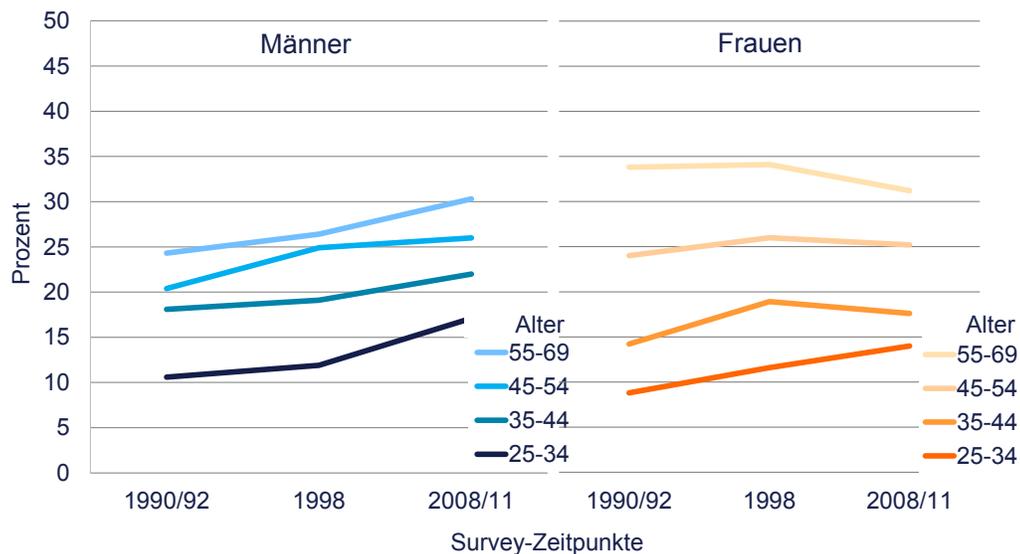


Figure 2: Trends in obesity among German adults, 1990-2011, DEGS, RKI [RKI 2012].
Alter=age, DEGS= Studie zur Gesundheit Erwachsener in Deutschland, RKI= Robert Koch Institut

Childhood obesity is punctuated by socioeconomic disparities. In both, the U.S. and in Germany, socioeconomic inequalities persist between normal weight and overweight/obese children. Families with lower socioeconomic status are more often overweight or obese and have higher mortality rates compare to families with a higher economic status, which often means a higher educational level, higher job positions, and higher incomes [Jones-Smith et al. 2014, Kurth et al. 2007, Lampert et al. 2013, Mackenbach et al. 2008, Morgenstern et al. 2009, RKI 2016, Shrewsbury et al. 2008].

Furthermore, overweight and obesity are also associated with various health problems such as heart disease, type 2 diabetes, cancer, and stroke, to name only a few [U.S. Department of Health and Human Services 2010, WHO 2016]. These physical health problems are frequently compounded by other social and psychological problems. Eisenberg et al. reported that overweight and obese adolescents often experienced being bullied and

teased by friends and family members, which can lead to low self-esteem, low body satisfaction, high depressive symptoms, and more thoughts about suicide as consequence [Eisenberg et al. 2003].

Yet, not only are individual health consequences noteworthy, but also the substantial health care expenditures related to obesity are also important to consider. In the U.S., the CDC cited a study by Finkelstein et al. from 2009 that found the annual costs of obesity and obesity-related diseases total \$147 billion of U.S. national health expenditures, which equates to about 10% of all medical costs [Finkelstein et al. 2009, CDC 2015c]. Another estimate, as shown in a study by Cawley and Meyerhoefer, calculated that the medical costs related to obesity-related illness in adults was even higher with \$209.7 billion in 2012 [Cawley and Meyerhoefer 2012]. Both studies showed that medical costs caused by obesity and obesity-related diseases are high and affect the health care system of the U.S.. In Germany, the annual medical costs are 20.26 billion Euros, which was 8.6% of total health expenditures in 2006, and even exceeded the medical cost of alcohol and tobacco together [Effertz et al. 2013, RKI 2009].

Childhood obesity is still a major public health concern and demands attention from individuals, societies, policy makers, community stakeholders, scientists, and politicians. Although the past couple of decades have produced a substantial amount of research to combat the obesity epidemic, the prevalence remains high in the U.S. and Germany. Scientists, politicians, and policy makers still need to learn how and why childhood obesity prevention programs are or are not effective [Visscher et al. 2015]. New strategies need to be developed to successfully prevent and control childhood obesity. One suggestion by Visscher et al. to understand and to prevent childhood obesity better is to study childhood obesity in long-term studies and to evaluate these studies [Visscher et al. 2015].

1.3 Causes of Overweight and Obesity

Obesity is a very complex disease with a multifactorial etiology. Potential causes include, but are not limited to: genetic and family background, lack of energy balance, physical inactivity, and poor quality of sleep. The environment individuals live in can also support the development of a higher bodyweight. In particular, today's work schedules often do not allow for time to be physically active, coupled with long work hours and commutes to and from work. Another community-level factor is the development of oversized food

portions in restaurants and fast food chains, leading to the consumption of excess calories. This is often compounded by a lack of access to healthy food options, leading to the consumption of calorically dense foods lacking in nutrients [Swinburn et al. 2011]. Furthermore, consumers are bombarded with advertisements and commercials from food companies, which often promote high-calorie, high-fat, and high-sugar snacks, as well as sugar-sweetened beverages [NIH 2012b, CDC 2015d].

1.4 The Importance of Multilevel and Multicomponent Strategies to combat Childhood Obesity

To date, the necessity of childhood obesity prevention strategies is widely acknowledged and a lot of research was conducted to fight the obesity epidemic. Despite this, many interventions target only small population groups or individuals [WHO 2012a]. While, the results of these interventions were promising, little action has been taken to translate these into population-level strategies to address childhood overweight and obesity [WHO 2012a]. To combat childhood obesity, the WHO has called for more population-based interventions to support healthy behaviors and decrease health risks. This presents an important shift in responsibilities, from individuals to governments and health ministries. Such strategies should entail policy support, education, monitoring, and the integration of evidence-based strategies into multilevel programs [WHO 2012a]. Other researchers and policy makers also recommended multidisciplinary approaches, which not only support change at the individual level, but also at the community levels, and which incorporate multiple community sectors. Behavior change needs to be addressed in the broader environment, among children and their family life, and approaches should be culturally relevant [Addy et al. 2015, Chan et al. 2010, Davison et al. 2001, Fialkowski et al. 2014, Flodmark et al. 2006, Gittelsohn et al. 2014, Gortmaker et al. 2011, Institute of Medicine 2012, Koplan et al. 2005, Krishnamoorthy et al. 2006, Oude Luttikhuis et al. 2009, Spivack et al. 2010, Summerbell et al. 2005, WHO 2014]. Since obesity is caused by many different reasons, it is important to implement cluster interventions [Vissher et al. 2015]. Ewart-Pierce et al. recently conducted a systematic review examining multilevel and multicomponent interventions, which showed promising results and called for more long-term strategies, which integrate policy and community components [Ewart-Pierce et al. 2016]. In 1992 Bronfenbrenner developed a framework addressing the need to include different levels to influence behaviors of each individual (Figure 3). This framework incorporates individual, interpersonal, organizational, community, and policy

levels [Bronfenbrenner 1992, Evert-Pierce 2016]. Lindsay et al. furthermore recommended that these multidisciplinary approaches also should include parents to ensure that families are properly supported around a healthy nutrition and physical activity, both inside and outside the home [Lindsay et al. 2006].

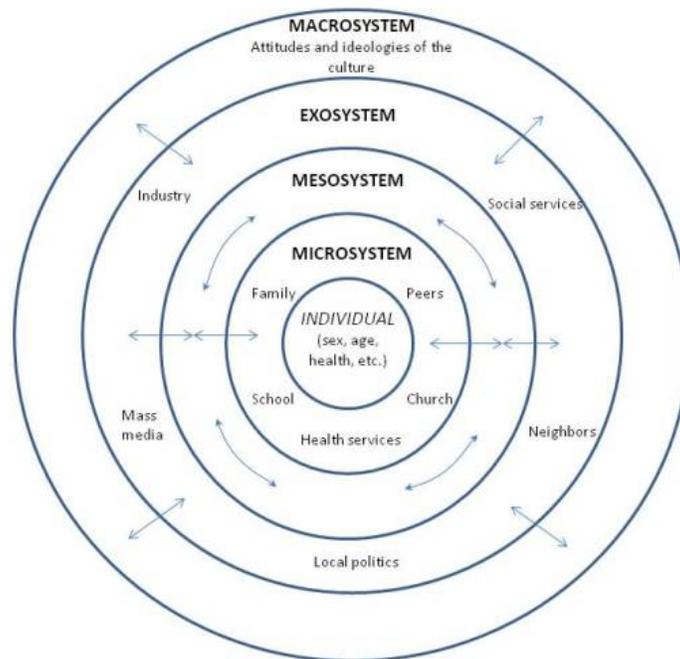


Figure 3: Bronfenbrenner’s ecological framework for human development [Bronfenbrenner 1992].

Beside the framework of Bronfenbrenner, the WHO developed an implementation framework for action on childhood obesity prevention (Figure 4). This framework shows how environments, policies, and programs can influence behavior change in a population, and how these behavior changes can have long-term social, environmental, health, and economic benefits. This highlights the importance of monitoring and evaluation for developing and implementing new policies and actions. The model also emphasizes the essential role of stakeholders² from varied backgrounds, which include not only governmental stakeholders, but also stakeholders from nongovernmental organizations, academia, and from the communities themselves [WHO 2008]. To successfully combat the obesity epidemic with its

² The Oxford Dictionary defines a stakeholder as “a person with an interest or concern in something.” [Oxford Dictionary 2016].

complex and varied determinants, as well as the influences of sectors and settings on the health environment, simultaneous actions are needed [WHO 2012a].

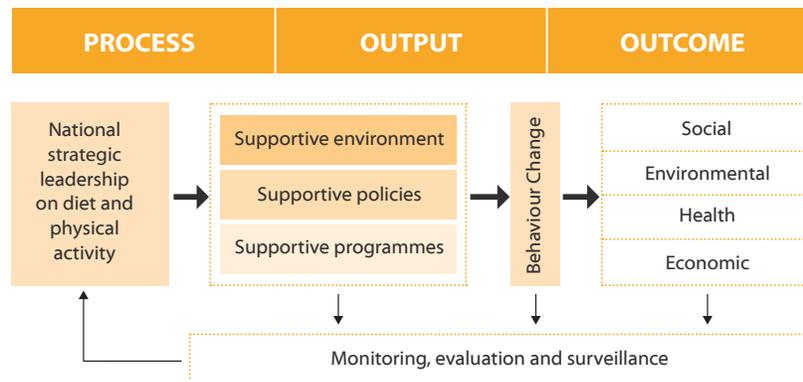


Figure 4: Implementation framework for action on childhood obesity prevention [From the Global strategy on Diet, Physical Activity and Health, WHO 2012a]

1.5 The Importance of Parent Involvement in Childhood Obesity Prevention and Control Strategies

As Lindsay et al. mentioned in their review, parents play an important role in obesity prevention strategies [Lindsay et al. 2006]. Parents influence their children’s lives and choices in many ways: the food they buy, the meal structure they have, their own nutrition and health literacy, eating practices, and their modeling of healthy and unhealthy eating and activity behaviors [Koplan et al. 2005]. Parents are key influencing their children’s lifestyles and they are gatekeepers to provide a home in which children learn to eat healthy and to be physically active. They are role models for their children and as such they influence their children’s choices. For example parents who regularly consume fruits and vegetables often have children who do the same [Cullen et al. 2000]. Davison et al. reported that the more parents support physical activity among their children, the more physically active their children actually are [Davison et al. 2003]. Koplan et al. for example made a call to parents to be positive role models of eating and physical activity behaviors for their children [Koplan et al. 2005].

But before parents can become positive role models, they need to have the knowledge, skills, and resources to have healthy habits. Successfully including parents in childhood obesity prevention and control programs is one way to do this. However, only few

studies have been conducted to determine the effectiveness of programs specifically addressing parents. There has been a call among researchers for more programs addressing and including parents to successfully help their children to live a healthy lifestyle [Lindsay et al. 2006].

Additionally, low-income families, who are disproportionately affected by childhood obesity compare to higher income families, face many different barriers when it comes to preventing unhealthy weight gain in their children. They combat problems such as substance addiction, homelessness or housing instability, and a lack of access to healthy food, all things, which work against families having adequate nutrition [Haynes-Maslow et al. 2011, Jeffery et al. 2005, Lucas et al. 2014, Smith et al. 2014, Sonnevile et al. 2009]. These barriers must be addressed directly within intervention strategies to successfully engage parents.

1.6 The Importance of Stakeholders in Childhood Obesity Prevention and Control Strategies

Within childhood obesity prevention, stakeholders should pursue the aim to help the population they serve to live a healthier lifestyle. Stakeholders are on-the-ground-experts who play an important role in planning and implementing large-scale interventions. These community representatives, such as teachers, early care and education staff, and community members work closely with families and their children, and can influence families' health choices. Consequently, their work can influence the results of childhood obesity prevention programs [Addy et al. 2015].

The WHO gives guidance on possible stakeholders, who can be engaged, their potential roles and responsibilities in obesity prevention and control interventions [WHO 2012a]:

1. ***Government on national, subnational, and local levels.*** The government could take action in leadership, policy approaches, funding, and guiding collaborations between multiple sectors.
2. ***International and regional organizations, such as WHO, Food and Agriculture Organization of the United Nations, or European Union.*** These organizations can help to improve public health through their impact on food

systems and physical activity environments. They can share experiences and knowledge between countries, which can benefit from these.

3. ***The private sector, which entails for example the food industry, consumer retailers, and the media and communication industry.*** Stakeholders from this sector can have a big influence on public health, since they can either act as a facilitator or barrier for a healthy lifestyle.
4. ***Civil society and nongovernmental organizations, such as scientific organizations, academia, and public interest organizations.*** These organizations can act as the “voice for the people” and can work with governments and influence these.

For successful program implementation, it is important to have buy-in from various stakeholders on the intervention activities. Therefore, the WHO also highlights the importance of involving stakeholders early in the process of program development (Figure 5).

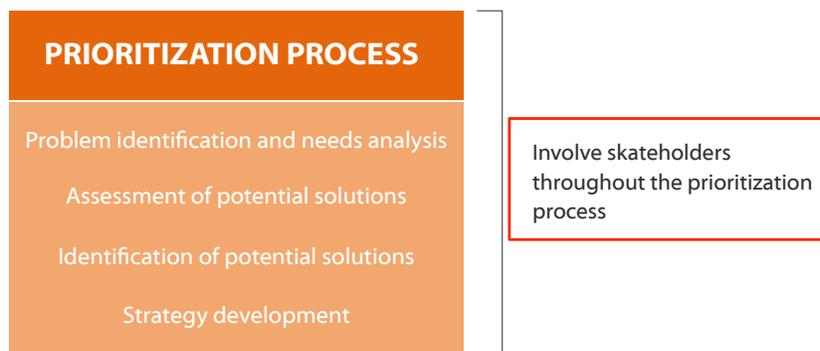


Figure 5: First step from schema for a systematic approach when prioritizing areas for action [WHO 2012a]

In summary, the importance of involving stakeholders throughout the entire implementation process for multidisciplinary interventions to combat childhood obesity, including planning, organizing, implementing, and evaluating, cannot be overstated [WHO 2012a].

However, to date, most childhood obesity prevention programs have been mainly evaluated against weight-related outcomes and information on why or why not an intervention was successful is missing [Hesketh et al. 2005]. As yet, little attention has been given to stakeholders, who often deliver program components, and their opinions about program implementation, although these experts can help explaining the success of these

strategies. Furthermore, how knowledgeable stakeholders are about families' experiences in participating in childhood obesity prevention programs, and the barriers these families experience has not been well-documented.

1.7 The Childhood Obesity Research Demonstration Study

The Childhood Obesity Research Demonstration study (CORD) is a CDC-funded multilevel and multisector program, which was implemented in three different sites in the U.S.: California, Massachusetts, and Texas. Additionally, the Texas Institute for Measurement, Evaluation, and Statistics at Houston University acted as the evaluation center for this program. The 'obesity chronic care model' guided the development of CORD (Figure 6) [Dietz et al. 2007]. This model involves not only individuals, but also the environment to help making healthier lifestyle choices. In this model, self-management is central, and it engages not only individuals themselves, but also other family members to help people make health behavior changes, such as improving diet quality and increasing physical activity. The improved health outcomes by each individual, their families, and society depend on both the effective delivery of health care, and on changes in schools, at work, and in communities [Dietz et al. 2007].

The Obesity Care Model

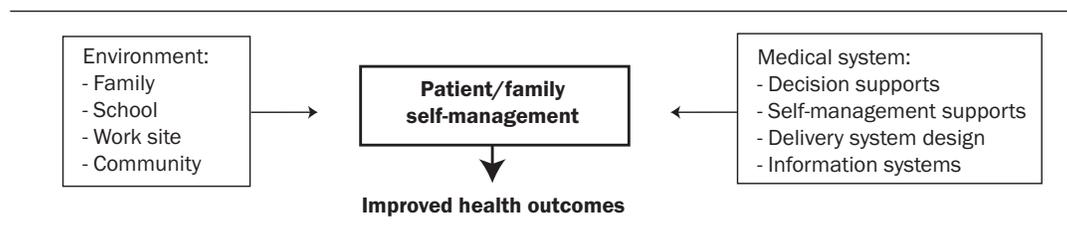


Figure 6: The Obesity Care Model by Dietz et al. 2007

Given that childhood obesity is more prevalent in underserved children, the CORD program targeted 2-12 year old children in low-income communities in all three sites [Foltz 2015, Kurth et al. 2007, Mackenbach et al. 2008]. The overall approach of CORD is illustrated by the five-tiered Health Impact Pyramid (Figure 7).

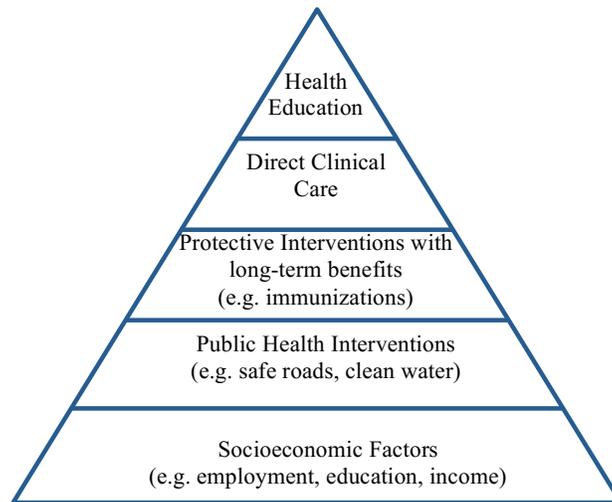


Figure 7: The Health Impact Pyramid by TR Frieden 2010

Within this pyramid, public health interventions focus on five different levels in order to have the greatest overall impact in a given population. The base of the pyramid, which highlights the greatest potential impact, shows interventions addressing socioeconomic factors of health. The following steps are public health interventions, interventions that change the context for individuals to make healthy decisions, interventions that have long-term effects and protection, interventions in clinical settings, and health education and counseling. Since it is essential that public health researchers reach a broad group of people and, ultimately, entire societies, the lower levels of the pyramid are more important to address compare to the higher levels, which mostly only reach individuals [Frieden 2010]. Interventions within the CORD program addressed the context level of the pyramid (policy and environment changes), the long-lasting protective interventions level (change within and across systems), and the clinical interventions level. Interventions to change policies, the environment and systems were implemented hoping that the interventions continue after the project period and become sustainable [Foltz et al. 2015].

On each site, the CORD project used existing state and community efforts to implement interventions to support healthy behaviors in children. Intervention sectors were elementary and middle schools, early care and education centers, primary healthcare, and different community settings. All sectors were linked by community health workers and community coalition members [Foltz et al. 2015]. Each project site and sector was encouraged to tailor program activities to their specific needs, hoping for better acceptance

and sustainability after the project ends [Dooyema et al. 2013]. Overall, the CORD study focused on five key health behaviors in each sector:

1. Switch from sugary drinks (like soda, sports, and fruit drinks) to water.
2. Watch no more than two hours of screen time per day (includes TV, smartphones, and hand-held video games).
3. Get at least one hour of physical activity (including active play) per day.
4. Replace sugary, salty, fried, and fast food with fruits and vegetables.
5. Sleep at least 11 hours per day (2-5 years old). Sleep at least ten hours per day (6-12 years old). [CDC 2015f].

A sample poster from the program's communication campaign addressed these five key behaviors within the Massachusetts site of CORD (MA-CORD: Massachusetts Childhood Obesity Research Demonstration study) and is shown in Figure 8.



Figure 8: MA-CORD Five Behavior Poster (Developed by Massachusetts Health Promotion clearinghouse)

This dissertation only used data from the MA-CORD program. Within MA-CORD, interventions, addressing these five key behaviors, were implemented in six different sectors: elementary and middle schools, afterschool programs, primary healthcare, early care and education programs, the communities, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)³. An overview about the interventions and data collected in each sector is shown in Table 1.

Table 1: MA-CORD: Interventions by implementation sector and expected change at individual, systems and community level

Intervention	Data collected	Individual/ Family	System	Community
Primary Healthcare and WIC: A practice change initiative (High Five for Kids) using the Chronic Care Model at the two community health centers serving both intervention communities, reaching up to 3,000 underserved children	Baseline and year 1: BMI, Parent survey targeting the five key behaviors for their children 2-12 years	Assessment, coaching, coordinated support	Obesity Learning Collaborative to improve obesity-related quality of care in health centers	Community Health Workers at each health center to link and integrate community obesity prevention activities with clinical practice
Early Care and Education: Nutritionist mentors help implement two linked interventions (I Am Moving, I Am Learning and NAP SACC) at nine child care centers reaching about 1,500 children	I Am Moving, I am Learning and NAP SACC	I Am Moving, I Am Learning promotes daily moderate to vigorous activity and healthy food choices	NAP SACC supports child care sites making policy and practice changes that include more attention to nutrition and physical activity	Sustained use of the two interventions in multiple child care sites can help change community norms and practices on physical activity and healthy eating for children, to address five key behaviors

³ <http://www.fns.usda.gov/wic/women-infants-and-children-wic>

Intervention	Data collected	Individual/ Family	System	Community
School and Afterschool: Three evidence based interventions: Food & Fun Afterschool, Eat Well and Keep Moving and Planet Health for schools, implemented in 23 elementary schools, 5 middle schools, and 17 afterschool programs, reaching about 10,000 students enrolled in grade 1-7	Baseline and year 1: Child behavior survey about the five key behaviors – 4 th and 7 th grade students, child BMI – 1st, 4th and 7th grade students	Motivates students and parents to eat better and stay active	Policy and practice changes	Implementation throughout school systems can change norms and practices on physical activity and healthy eating for children, and to address five key behaviors
Community: Multi-faceted interventions, led by municipal coalitions incorporate environmental and policy change, activity groups and youth-driven media, designed to reach about 18,000 children ages 2-12 in both communities	-	Support for activity groups (walking clubs, exercise groups, bike clubs)	Environmental and policy change focuses on bikeability, walkability and a Safe Routes to Schools program	Youth-driven media campaign to change community norms and practices in five key behaviors

WIC = The Special Supplemental Program for Women, Infants, and Children, NAP SACC = Nutrition and Physical Activity Self Assessment for Child Care

1.8 The Importance of Qualitative Research when Implementing Childhood Obesity Interventions

Over the years, defining the term “*qualitative research*” has become more nebulous. Creswell explains this phenomenon with the researchers’ concern of having a fixed definition [Creswell 2007, p. 36]. Creswell himself defines “*qualitative research*” as follows:

“Qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem. To study the problem, qualitative researchers use an emerging qualitative approach to inquiry the collection of data in a natural setting sensitive to established patterns or themes. The final written report or presentation includes the voices of participants, the reflexivity of the researcher, and a complex description and interpretation of the problem, and it extends the literature or signals a call for action.” [Creswell 2007, p. 37].

Compared to quantitative research, which usually is analyzed mathematically, qualitative research is analyzed through the scientist’s lens [Foundation of Qualitative Research in Education 2008]. Within qualitative studies, researchers report multiple perspectives of a problem, identify several factors that are involved in a situation, and in the end report the larger picture that emerges from the data. Researchers in qualitative science identify complex interactions of elements, rather than cause-and-effect relationships [Creswell 2007, p. 39].

Just as there are several definitions of qualitative research, there also exist different approaches to this work, including grounded theory, narrative research, and case studies, to name only a few. In general, regardless of the specific approach used, questions first emerge from an initial review of the data and data analysis builds from narrow to specific themes to broader or more general themes. The researcher itself interprets the data when reporting the results. The final report of the results has a flexible structure and the focus of qualitative research lies within individual meanings compare to quantitative data, which often focus on large data sets [Creswell 2007, p. 4].

Why then is qualitative research important when implementing multidisciplinary interventions to prevent childhood obesity? As Dr. Paul E. Farmer said:

“We have to design a health delivery system by actually talking to people and asking, ‘What would make this service better for you?’ As soon as you start asking, you get a flood of answers.” [Dr. Paul E. Farmer].

When it comes to childhood obesity prevention research, many causes or influential factors are known [CDC 2015b, NIH 2012b, Swinburn et al. 2011]. However, there exist gaps in childhood obesity prevention research about the reasons of why affected people do not want, or are not able to prevent them from becoming overweight or obese. There exists a gap between the knowledge researchers have expanded in recent years, and the changes in behaviors they were hoping to achieve with that gained knowledge. Qualitative data gives scientists the tools to expand their research questions to achieve deeper, more complex insights into the problems and barriers affected people face when it comes to childhood obesity prevention and control.

Within qualitative research, such as semi-structured interviews, researchers have the ability to ask open-ended questions. These give the interview participant the opportunity to share their personal opinions about and experiences with specific phenomena. Data the researcher gains from this method are rich in information and leave room for interpretation. With qualitative methods, researchers not only gain information on *what*, *when*, *where* or *who*, but also on *why* and *how* things happen and guide the process of decision-making [Creswell 2007, p. 40]. Qualitative studies explore suggestions on how to adapt interventions to individual and community needs and therefore add to existing epidemiology and behavioral evidence [Corrigan et al. 2006].

Furthermore, authors of a recent review of childhood obesity interventions concluded that more qualitative research is required to better understand community stakeholders’ view and families’ opinions about obesity prevention programs. Furthermore, they said that qualitative research is important to better understand why intervention programs might be more or less successful [Oude Luttikhuis et al. 2009]. Vissher et al. said that process evaluation, which is important when measuring the success of an intervention, often includes some qualitative studies. Furthermore, they showed that qualitative studies can provide lessons learned from experts, such as stakeholders and the population. And even though these studies are more difficult to publish, they are very important when learning about the success and the failure of prevention studies [Vissher et al. 2014].

Although researchers can gain valuable insight from stakeholders' experiences with complex interventions such as MA-CORD, few studies provide a detailed qualitative account on the implementation of a large-scale intervention at its conclusion [Oude Luttikhuis et al. 2009, WHO 2012b, WHO 2014].

1.9 Research Aims

Every country needs healthy children and adults. Therefore, it is important to address the childhood obesity problem through different approaches, such as programs, politics, research, and through policies. Furthermore, it is important to not only address individuals, but also whole population groups [WHO 2012a]. Research has shown that interventions are more successful when multiple sectors, such as schools, primary healthcare and community programs, worked together to combat the childhood obesity issue [Addy et al. 2015, Ewart-Pierce et al. 2016]. In addition, programs and interventions are more sustainable when implemented together with community stakeholders, who work close with the affected children and families and who know the community they work and live in best. Therefore, including stakeholders when planning and conducting different interventions to address childhood obesity is highly important [Addy et al. 2015, WHO 2012a]. But before new interventions can be implemented it is essential to capture the actual state of the intervention location and the stakeholders' awareness about childhood obesity. Also, for successful program implementation it is important to evaluate intervention programs. Only with an evaluation it is possible to learn for future intervention programs to address possible problems, and use the knowledge gained through successes [WHO 2012a].

This dissertation addressed these gaps and focused on qualitative semi-structured interviews with community stakeholders from different sectors of the MA-CORD program to answer the following research questions:

1.9.1 Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention in Low-Income Families, Massachusetts 2012–2013

- 1) What are community stakeholders' perceptions of obstacles low-income parents experience in the context of childhood obesity prevention?

- 2) Using the Family Ecological Model: To what extents align stakeholders' perceptions with parents' perceptions about barriers and obstacles when it comes to healthy lifestyle choices and childhood obesity prevention?
- 3) How do stakeholders' perceptions vary by community sector and organizational role?

This project used the Family Ecological Model (FEM) (Figure 9) to identify barriers low-income families experience when it comes to childhood obesity prevention. The Ecological Systems Theory guided the development of the FEM [Bronfenbrenner 1992]. The model focuses on contextual and family factors that influence healthy lifestyle choices. It focuses on families as intervention targets and not only on individuals [Davison et al. 2012]. The purpose of the development of the FEM was to guide and support childhood obesity prevention research targeting low-income families. It furthermore emphasizes the importance of targeting families across multiple community sectors [Davison et al. 2012, Davison et al. 2013].

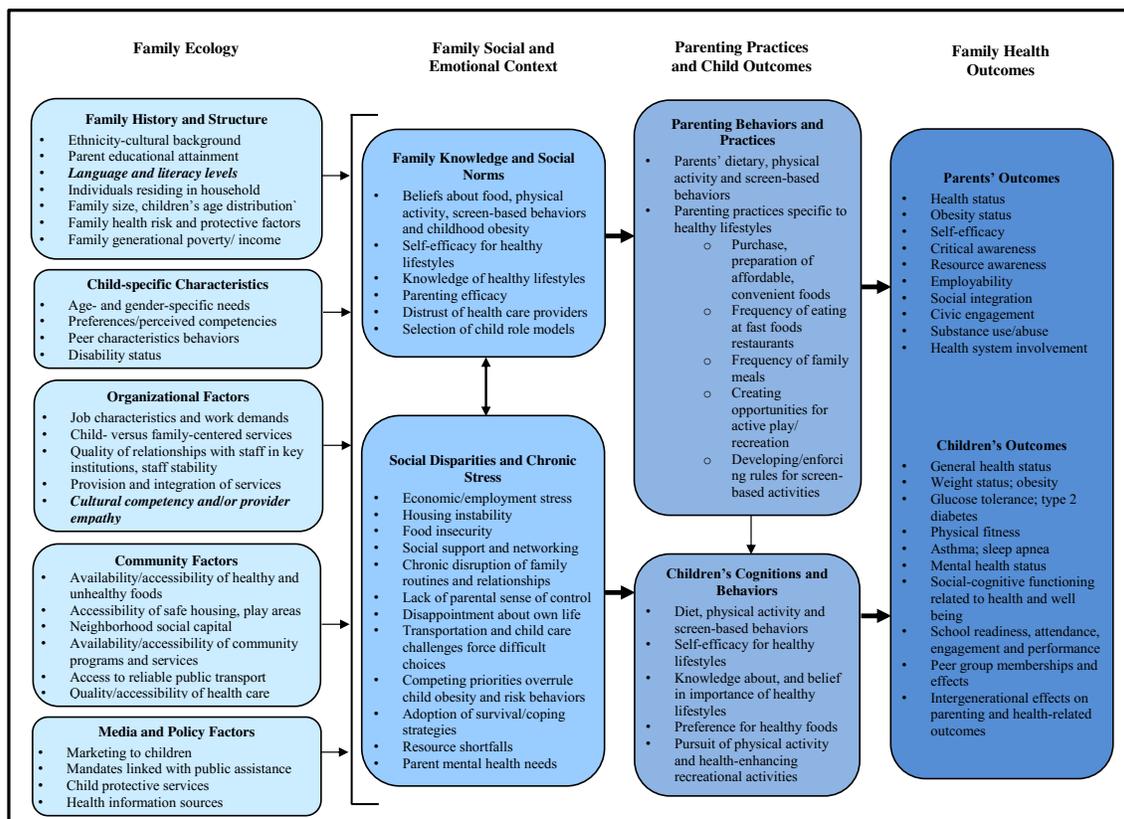


Figure 9: The Family Ecological Model [Davison et al. 2012]

For this study, we interviewed 39 stakeholders from the MA-CORD program. Stakeholders were from the following sectors: afterschool programs, elementary and middle schools, primary healthcare, WIC, and from early care and education centers. Interviews were conducted either in person or over the phone. All interviews were audiotaped, transcribed, and entered into QSR NVivo version 10.0, a computer program for analyzing qualitative data. For data coding, the *Family Ecology* and *Family Social and Emotional Context* domains from the FEM were used.

1.9.2 Community Stakeholders' Perceptions of Major Factors Influencing Childhood Obesity, the Feasibility of Programs Addressing Childhood Obesity, and Persisting Gaps

- 1) What are major factors contributing to childhood obesity in the two intervention communities?
- 2) How feasible was the implementation of past childhood obesity prevention strategies in the stakeholders' community?
- 3) From a stakeholders' perspective, what is missing in past and current childhood obesity prevention and control strategies?

For this study, we used the same semi-structured stakeholder interviews as for publication 1. Interviews were analyzed using a grounded theory approach. Interview transcripts were reviewed and interview content was collected in recurrent themes [Creswell 2007]. With these themes, we developed a coding framework to organize, analyze, and summarize the data.

1.9.3 Lessons Learned in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project: The Perspective of Community Stakeholders, Massachusetts 2013-2014

- 1) What are successes community stakeholders directly involved in MA-CORD experienced during and after the implementation of MA-CORD?
- 2) What lessons did the stakeholders and program implementers learn during and after MA-CORD program implementation?

The study results provide critical perceptions about aspects influencing the implementation process of MA-CORD. In this study, we interviewed community stakeholders from the same two intervention communities, but after the implementation started. We interviewed 40 stakeholders yielding in 39 interviews. Stakeholders came from the following sectors: afterschool programs, elementary and middle schools, primary healthcare, WIC, from the Parks and Recreation Department, and community coordinators. Interviews were conducted over the phone. All interviews were audiotaped, transcribed, and entered into NVivo 10.0. For data analysis we used constant comparative method, based in grounded theory [Braun et al. 2006, Creswell 2007].

2 Results

2.1 Print version: Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention in Low-Income Families, Massachusetts 2012-2013

The final publication is available at Preventing Chronic Disease via
<https://doi.org/10.5888/pcd12.140371>

Citation: Ganter C, Chuang E, Aftosmes-Tobio A, Blaine RE, Giannetti M, Land T, Davison KK. Community stakeholders' perceptions of barriers to childhood obesity prevention in low-income families, Massachusetts 2012-2013. (2015). *Prev Chronic Dis*. Mar 26;12:E42. doi: 10.5888/pcd12.140371. PMID: 25811497

2.2 Post print: Community Stakeholders' Perceptions of Major Factors Influencing Childhood Obesity, the Feasibility of Programs addressing Childhood Obesity, and Persisting Gaps

The final publication is available at Springer via
<http://dx.doi.org/10.1007/s10900-015-0097-y>

Citation: Ganter C, Aftosmes-Tobio A, Chuang E, Blaine RE, Land T, Davison KK. Community stakeholders' perceptions of major factors influencing childhood obesity, the feasibility of programs addressing childhood obesity, and persisting gaps. *Journal of Community Health*. (2015) Oct. 3. (DOI) 10.1007/s10900-015-0097-y

2.3 Print version: Lessons Learned in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project: The Perspective of Community Stakeholders, Massachusetts 2013-2014

The final publication is available at Preventing Chronic Disease via
<https://doi.org/10.5888/pcd14.160273>

Citation: Ganter C, Aftosmes-Tobio A, Chuang E, Kwass JA, Land T, Davison KK; MA-CORD Study Group. Lessons Learned by Community Stakeholders in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project, 2013-2014. *Prev Chronic Dis*. 2017 Jan 26;14:E08. doi: 10.5888/pcd14.160273. PMID: 28125400

3 Discussion

Multidisciplinary programs are tailored to address whole population groups rather than individuals and are implemented simultaneously in multiple sectors [Ewart-Pierce et al. 2016]. The MA-CORD program was implemented that way and one result is that stakeholders participating in MA-CORD reported, for example that the five key behavior messages of the program, such as ‘switch from sugary drinks to water’, ‘no more than two hours of screen time per day’, ‘one hour of physical activity per day’, ‘replace unhealthy food with fruits and vegetables’, and ‘sleep at least ten/eleven hours per day’, could be seen throughout the community and several sectors and therefore the program raised awareness about and interest in childhood obesity prevention. Furthermore, did not only parents and their children become more aware about childhood overweight and obesity, but also the stakeholders themselves. That made it easier for the population to understand and to accept these messages. Additionally, if different sectors worked together in a community and delivered similar health messages, the population’s confusion about a complex topic such as obesity could be decreased. Multidisciplinary interventions play an important role in public health research and should be emphasized in future intervention studies [Creswell 2007, Golan and Crow 2004, WHO 2012a].

Furthermore, as several studies have shown, intervention programs are most successful when they are sustainable [WHO 2010]. Within the MA-CORD intervention, program implementers at each site and in each sector were encouraged to tailor program activities to their specific needs [Dooyema et al. 2013], which resulted in an increase of program acceptance and hopefully will lead to more sustainability of program components after implementation. For example one intervention in the school sector was the implementation of school curricula that teachers could use in different subjects they taught, for example math, language arts, and social studies [Eat Well and Keep Moving as well as Planet Health]. The curricula entailed activities and lessons addressing the five key behavior messages. The two different curricula are flexible tools to use by implementing teachers. Once teachers are used to the new curriculum and found a way to implement it during their lessons, it will be easier for future implementation and it may even become a routine, which increases the chances to be a sustainable tool to use in the school sector. Another tool for program sustainability is the implementation of policies or the change of existing policies [WHO 2010]. The MA-CORD program especially encouraged stakeholders from afterschool programs, schools, and early care and education centers to change their existing policies to

become a healthier environment for children and staff. Examples mentioned by stakeholders for the school, afterschool, and primary healthcare sector are the elimination of vending machines offering unhealthy snacks. Building an environment in which mostly healthy snacks are available increases the chances of learning healthier behaviors for the population groups in these sectors.

But besides implementing interventions considering the above named aspects, the inclusion of community stakeholders in childhood obesity prevention and control efforts is essential [Addy et al. 2015, WHO 2012a]. Having the support of these stakeholders can make all the difference since it can help influencing families and their children to make the right choices. It may also increase program acceptance and participation by families. Furthermore, stakeholders' opinions about the implementation process of such a multicomponent program are an important tool when evaluating the program. Therefore, MA-CORD included these experts from the beginning of program planning to the end of the implementation.

By including community stakeholders in research, scientists can gain valuable information when planning and conducting new obesity prevention programs [Braun and Clarke 2006, Golan and Crow 20014, Lindsay et al. 2006]. Helpful tools to obtain this information are qualitative methods [Corrigan et al. 2006, Creswell 2007]. With semi-structured interviews, researchers have the possibility to ask open-ended questions and to delve more deeply into the participants' understanding about childhood obesity and its prevention. However, the inclusion of qualitative research and stakeholders' opinions when planning and implementing new intervention strategies is scarce.

To address this gap, this dissertation focused on qualitative semi-structured interviews conducted with stakeholders from the two MA-CORD intervention communities. The interviews were conducted at two time periods, at program baseline before the intervention started and at follow-up one to one and a half years later. At baseline, we interviewed stakeholders about their experiences when working with low-income families in childhood obesity prevention programs. We wanted to know about the stakeholders' perceptions on families' experienced barriers and obstacles when it comes to participation in childhood obesity prevention efforts. Furthermore, we wanted to know to what extent these stakeholders were aware of the causes of childhood obesity in their communities and about their own experiences with past obesity prevention strategies. At the follow-up interviews we asked stakeholders about the MA-CORD program. We wanted to gain feedback about the program implementation process. Especially we wanted to document successes the MA-CORD project achieved, and also take stock of lessons learned from the program

implementation.

In **publication 1**, we wanted to characterize the stakeholders' perceptions about challenges and barriers low-income families and their children experience when participating in childhood obesity prevention programs. We furthermore, wanted to know to what extent the stakeholders' perceptions align with parents' perceptions using the FEM. At last, we wanted to assess the differences in stakeholders' perceptions by community sector.

Results of this study showed that the interviewed community stakeholders within the MA-CORD program and across the intervention sectors were aware about the challenges parents face when it comes to childhood obesity prevention efforts. They understood the contextual factors influencing a families' life and the social and emotional dynamics that influence families when making healthy lifestyle choices. In general, stakeholders are very much engaged with families and their children in their communities. That emphasizes the importance that stakeholders' knowledge about families align with families' own experiences when implementing new intervention strategies for childhood obesity prevention.

Other results from this study showed that addressing a child's weight is a very sensitive topic to discuss with parents. In addition, our results showed that not only the language stakeholders use to address the children's weight is important, but also the stakeholder's cultural competency and empathy. Stakeholders reported that it is essential to consider cultural differences when talking about a child's weight to foreign clients or clients with another cultural background. Stakeholders and researchers need to understand these cultural differences to efficiently implement new intervention strategies and to effectively address the populations' needs, for example, the misperception of a healthy weight in some population groups [Twarog et al. 2016]. Stakeholders and scientists need to be aware of this understanding to accordingly plan intervention strategies. The consideration of cultural differences is for example important in U.S. regions with a high percentage of foreign populations, for example Hispanics and Asians, two of the largest growing minority groups in the U.S. [United States Census Bureau 2012]. In Germany, these cultural differences should find consideration as well, when addressing immigrant groups, such as the Turkish population, which is the largest immigrant group with 1.5 million people living in Germany [Statista 2016 – ASANA]. Furthermore, the consideration of cultural differences became even more important in European countries with a high percentage of refugees since the so-called "Refugee Crisis".

Additionally to a population's cultural background, in some population groups it also appeared that parents might not be the only caretakers of their children. Extended family

members, often grandparents, help raising their children's children, for example in Hispanic families [Golan and Crow 2004, Lindsay et al. 2006, Rhee et al. 2005]. Furthermore, stakeholders reported that parents regularly gain their nutritional knowledge from their own parents. That emphasizes the importance to include extended family members in childhood obesity prevention and control strategies.

Our study showed that stakeholders across different community sectors are aware about the challenges and barriers low-income parents and their children encounter when it comes to childhood obesity prevention strategies. These results are promising since they showed that community stakeholders already gained some fundamental knowledge about childhood obesity and its prevention. New intervention studies can build upon this knowledge when planning and implementing new approaches.

In **publication 2**, we looked into the knowledge of these on-the-ground-experts and their perceptions about major factors contributing to childhood obesity, the feasibility of already conducted childhood obesity prevention programs in their organization or community, and persisting gaps in childhood obesity prevention strategies. Stakeholders named some successful obesity prevention programs, but also appointed missing strategies. A main result of this study was the stakeholders' call for more nutrition and physical activity related policy changes. Some interviewed stakeholders mentioned that it was easier to implement new strategies, which were mandatory. They said new policies would force them to implement new strategies. If new strategies were optional, often other things were given a higher priority, which lead to disregarding the new intervention. One big advantage of policy changes named by some stakeholders is that these changes affect an entire group, organization, or community, which makes it easier for each individual to adapt to the changes. This supports previous findings, which show that chances are higher for sustainable change, when changes are policy implicated [Addy et al. 2015].

Another important finding of this study was the stakeholders' wish for more communication and collaboration across sectors when implementing new childhood obesity prevention and control programs. Stakeholders reported that they usually work on the same goal: to decrease the prevalence of childhood obesity. Within that goal they argued that new implementation programs would be more successful when stakeholders across sectors would work together and if they would use this collaboration to learn from each other's experiences. These data support the findings of several study groups that call for the implementation of multilevel and multisector intervention programs, in which groups across multiple sectors

work together, to combat childhood obesity [Addy et al. 2015, Jones-Smith et al. 2014, WHO 2012a]. Future multidisciplinary interventions therefore should support the linkage between multiple sectors and should provide possibilities for cross-sector communication and collaboration.

Furthermore, stakeholders reported that physical activity related intervention components usually had high attendance rates and were accepted by the children. Yet stakeholders complained about the lack of options children have to be physically active during the school day and reported that more physical activity options are needed, since recess and other possibilities to be physically active during the school day were reduced. Stakeholders of school and afterschool programs often discussed that there is no time for activities since this time needs to be used to achieve higher test scores. However, teachers and afterschool staff from the MA-CORD study, and other research groups argued that actually being physically active can lead to an increase of higher scores since it improves the students' concentration and test results [CDC 2010]. Future interventions therefore should include some strategies to increase physical activities to not only help children live a healthier life, but also to increase their performance during the school day.

Results from this study are encouraging since they showed that some successful childhood obesity prevention strategies have already been in place and the development of new interventions can build on these. Analyzing the actual conditions in the intervention communities can be very helpful when planning and conducting new strategies accordingly and when building on past successful strategies. Furthermore, the study showed that policy changes could help increasing the acceptance of new strategies by the target population. Moreover, an increase in collaboration and communication across sectors can help understanding new intervention strategies better and to learn from each other's experience when implementing these new strategies. Future interventions could provide a communicational tool for stakeholders across sectors for easier and better communication right from the beginning of program planning and implementation.

In **publication 3**, we wanted to examine successes the MA-CORD program achieved and lessons learned from the implementation process of the program. Reporting successes and lessons learned from implementing a community-based intervention is important since it includes valuable information for other researchers who plan to implement similar intervention strategies. One success of the intervention, which was reported by stakeholders that participated in MA-CORD, is an increase of parent involvement since the program was

launched. As several studies have already shown, parents are key for successful program implementation when addressing childhood obesity [Lindsay et al. 2006]. Young children are not the ones who shop groceries or who make decisions when it comes to meal preparation or other healthy behaviors. But parents imply a significant role controlling their children's weight, being role models and encourage their children to healthy behaviors [Cullen et al. 2000, Davison et al. 2003, Golan and Crow 2004, Koplan et al. 2005, Lindsay et al. 2006, Rhee et al. 2005]. The MA-CORD program used diverse strategies to approach parents, directly and indirectly through their children, which might be one reason why parent involvement increased. Future studies should entail strategies to successfully include parents in prevention strategies.

To increase parent involvement further and to address parents and other community members efficiently, stakeholders reported that consistent messaging throughout the whole community is essential to change behaviors within multisector interventions. A good connection and linkage between these different organizations and sectors can help deliver the same messages to the target population. Stakeholders reported that families who received consistent messages from different organizations were less confused about the program. It helped to reinforce healthier choices within these families. They mentioned that they were able to develop connections within organizations and between community agencies within the MA-CORD program.

A novel finding was the secondary effect of the program on stakeholders' behavior and their perceived function as role models for the children and families they serve. Stakeholders were motivated to change their own behaviors to a healthier lifestyle to become positive role models. The learning effect of several implementations on stakeholders' behaviors should not be underestimated and can be a great motivational tool when working with community stakeholders.

In MA-CORD, it was important to not only have support from all participating stakeholders, but also from project leaders and organization administration. When administrative and leadership support was absent, other events were given higher priority than the project, and it was more difficult to implement intervention components. Therefore, it is essential to gain leadership and administrative support before implementing the new program.

Furthermore, within MA-CORD we encountered unexpected changes, such as staff turnover, which supports other researchers' findings [Habib-Mourad and Ghandour 2015]. We learned that building in extra time at the beginning of a project to introduce new staff to

the program would have avoided time and organizational challenges. Unplanned events can be addressed effectively if the project anticipates these possibilities from the beginning.

Although the MA-CORD program understood the importance of creating linkages within the communities, stakeholders discussed their desire for more possibilities to communicate across project sectors. Specifically, they asked for a communication tool to be able to discuss planned strategies and experiences with other stakeholders. This opens the possibility for increasing the motivation of stakeholders, since it would connect stakeholders to others sharing the same issues, challenges, experiences, and successes. Stakeholders even asked for a communication tool across the two intervention communities. For future intervention programs, including social media could be such a communication tool for stakeholders and program leaders.

During the planning process of complex interventions, it is also highly important to consider the needs of the population the program will serve. This includes the needs of participating stakeholders, but also life circumstances and barriers families experience when trying to achieve healthy choices. This supports previous findings that interventions are less successful when families' more immediate needs and issues are not carefully considered [Davison et al. 2001].

Overall, studies documenting lessons learned from conducting interventions are a critical tool that can be used to plan future studies and are therefore important examples. This study gives other researchers insights to an implementation process with its successes and lessons learned. Community stakeholders are an important and powerful resource when planning and conducting a new intervention to combat childhood obesity. This supports findings from the WHO [WHO 2012a]: Not only are stakeholders important because they know the community they work in, but also they are a very important help when connecting the target population with researchers. The knowledge and experiences of these experts is highly valuable since these can help researchers to plan new intervention studies with higher chances to be successful.

Strengths and Limitations

This dissertation with its three publications has its strengths and limitations. All three publications examined the knowledge, experiences, and opinions of community stakeholders during the planning and implementation of the MA-CORD intervention. So far, obesity intervention studies have mostly been analyzed by weight related outcomes and the

knowledge of stakeholders working in the intervention communities is rare [Oude Luttikhuis et al. 2009, WHO 2012b, WHO 2014]. The studies focused on stakeholders, who deliver intervention components to the families and their children to gain their insights during program implementation, which is essential to the successful implementation of intervention programs [Braun and Clarke 2006]. Even though the WHO said that including community stakeholders in the process of planning and conducting a childhood obesity intervention is highly important, to date, stakeholders have not been emphasized in this field of research [WHO 2012a]. Furthermore, it is novel that all three publications included stakeholders from different community sectors (afterschool programs, elementary and middle schools, early care and education centers, WIC, primary healthcare, the Parks and Recreation department, and program coalition members) to gain a better understanding of the problems and differences between these sectors when it comes to childhood obesity prevention efforts. We used a qualitative approach with semi-structured interviews in all three studies to ask open-ended questions to get a better understanding of what is and what is not working well in childhood obesity prevention strategies in the two intervention communities. Qualitative methods give researchers the opportunity to expand their questions and gain a deeper knowledge about successes and lessons learned in childhood obesity prevention programs [Oude Luttikhuis et al. 2009].

Beside those strengths, these dissertation studies also have limitations that need consideration when interpreting the results. First, all three studies interviewed stakeholders from the MA-CORD program, which suggests that these stakeholders might already had an interest in childhood obesity prevention and therefore may not represent other stakeholders in other low-income communities. In addition, not all intervention sectors were equally represented in the studies, due to the use of convenience sampling in our study sample. Aside from stakeholders' existing involvement with MA-CORD, no other exclusion criteria were defined. Therefore, results might not represent the opinions of all stakeholders in the two intervention communities and must be interpreted with caution. Data were collected in the Northeastern U.S., and in low-income communities and results of these studies might not be applicable to other low-income regions. However, a detailed description of the interview participants and the two intervention communities might help other researchers to apply our results to their studies. We had difficulties to gain stakeholders interest to participate in a follow-up interview. Although we offered a compensation of \$20 to each participant, and asked 183 stakeholders to participate, only 40 participants were interviewed. This could

indicate a selection effect where the stakeholders most committed to the MA-CORD program chose to participate, which should be considered when applying the results to other interventions.

4 Conclusion

A healthy society needs a healthy population. Obesity and childhood obesity is still a major public health concern and affects many children and adults worldwide. So far, only a few successful strategies exist for children and adults to lose weight and to maintain a healthy weight. Therefore, obesity prevention strategies are more promising. Since population groups from all over the world are affected by overweight and obesity it is important to develop intervention strategies tailored to the specific needs of this specific population group. Interviewing community stakeholders who are directly involved with affected families and their children helped developing and planning a successful obesity prevention program.

The results from these three dissertation studies are promising because they show the awareness community stakeholders have about challenges and barriers low-income families face when trying to participate in childhood obesity prevention programs. They furthermore show that stakeholders already have a good understanding of the causes of childhood obesity and of successful strategies to combat that epidemic. And last, the results show many successes and lessons learned of the MA-CORD program. All these findings can help guiding future multidisciplinary interventions.

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6 Attachment

6.1 Publication 1 – Print version:

Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention in Low-Income Families, Massachusetts 2012-2013

Citation: The final publication is available at Preventing Chronic Disease via <https://doi.org/10.5888/pcd12.140371>

Ganter C, Chuang E, Aftosmes-Tobio A, Blaine RE, Giannetti M, Land T, Davison KK. Community stakeholders' perceptions of barriers to childhood obesity prevention in low-income families, Massachusetts 2012-2013. (2015). *Prev Chronic Dis*. Mar 26;12:E42. doi: 10.5888/pcd12.140371. PMID: 25811497

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My contribution to the publication:

I contacted stakeholders to ask for interview participation. A colleague (AA) and I conducted the interviews, either in person or over the phone. I transcribed some interviews and organized transcription with a professional transcription company (Landmark Associates Inc.). I reviewed the transcribed interviews for accuracy and entered the transcripts into NVivo QSR 10.0, software for analyzing qualitative data. I prepared the coding framework using the Family Ecological Model. A colleague (REB) and I coded ten interview transcripts for reliability coding. Coding and disagreement was discussed and a consensus meeting was held with my advisor, KKD. The coding framework was finalized and I coded all interviews using this framework. After coding, I analyzed the interview data and summarized the results. Results were discussed with KKD. I drafted the paper for publication and edited co-author comments.

Results were presented at the Experimental Biology conference in Boston, USA, 2013.

ORIGINAL RESEARCH

Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention in Low-Income Families, Massachusetts 2012–2013

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Suggested citation for this article: Ganter C, Chuang E, Aftosmes-Tobio A, Blaine RE, Giannetti M, Land T, et al. Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention in Low-Income Families, Massachusetts 2012–2013. *Prev Chronic Dis* 2015;12:140371. DOI: <http://dx.doi.org/10.5888/pcd12.140371>.

PEER REVIEWED

Abstract

Introduction

The etiology of childhood obesity is multidimensional and includes individual, familial, organizational, and societal factors. Policymakers and researchers are promoting social–ecological approaches to obesity prevention that encompass multiple community sectors. Programs that successfully engage low-income families in making healthy choices are greatly needed, yet little is known about the extent to which stakeholders understand the complexity of barriers encountered by families. The objective of this study was to contextually frame barriers faced by low-income families reported by community stakeholders by using the Family Ecological Model (FEM).

Methods

From 2012 through 2013, we conducted semistructured interviews with 39 stakeholders from 2 communities in Massachusetts that were participating in a multisector intervention for childhood obesity prevention. Stakeholders represented schools; afterschool programs; health care; the Special Supplemental Nutrition Pro-

gram for Women, Infants, and Children; and early care and education. Interviews were audio-recorded, transcribed, coded, and summarized.

Results

Stakeholder reports of the barriers experienced by low-income families had a strong degree of overlap with FEM and reflected awareness of the broader contextual factors (eg, availability of community resources, family culture, education) and social and emotional dynamics within families (eg, parent knowledge, social norms, distrust of health care providers, chronic life stressors) that could affect family adoption of healthy lifestyle behaviors. Furthermore, results illustrated a level of consistency in stakeholder awareness across multiple community sectors.

Conclusion

The congruity of stakeholder perspectives with those of low-income parents as summarized in FEM and across community sectors illustrates potential for synergizing the efforts necessary for multisector, multilevel community interventions for the prevention of childhood obesity.

Introduction

Approximately 1 in 5 children and adolescents in the United States aged 2 to 19 years is obese (1). Although 2011–2012 data from the National Health and Nutrition Examination Survey (NHANES) illustrates that obesity among preschoolers has significantly decreased from previous estimates, racial/ethnic and socioeconomic disparities in childhood obesity persist (1,2). The etiology of childhood obesity is multidimensional and includes familial, organizational, and societal factors. To more effectively address these factors, policymakers and researchers are increasingly promoting



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social ecological approaches to obesity prevention that encompass multiple community sectors (3–8). Multi-sector approaches require stakeholders to work collaboratively across community sectors to develop and sustain programs that influence policies, systems, and environments in ways that make it easier for families to make healthy lifestyle choices, such as purchasing and consuming healthful food and engaging in physical activity such as outdoor play.

To effectively support behavior change through a synergistic, multisector approach, stakeholders in participating sectors must be aware of the complex and multifaceted barriers to behavior change encountered by families, particularly low-income families (9–13). Gaps in stakeholder awareness within or across sectors would compromise the concentrated effort needed to prevent obesity; these gaps indicate the need for additional training. However, to our knowledge, the extent to which stakeholders are informed about families' experiences in relation to obesity prevention has not been documented in obesity prevention research.

To address this gap, we interviewed key stakeholders across 5 community sectors: primary health care providers (health care); the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); early care and education (early education), schools, and afterschool programs. Our objectives were to 1) characterize stakeholders' perceptions of the barriers low-income parents experience in the context of obesity prevention, 2) examine the extent to which stakeholders' perceptions align with parents' perceptions as documented in the Family Ecological Model (FEM); and 3) assess variations in stakeholders' perceptions by community sector.

The FEM was used to guide this study (Figure). FEM was developed to support and guide research in childhood obesity prevention and has been validated with a cohort of low-income families with preschool-aged children via an in-depth qualitative approach (14,15). Consistent with ecological systems theory (16), FEM outlines contextual and family systems factors that influence children's diets, physical activity, and screen-based behaviors and highlights the importance of engaging families in obesity prevention strategies across community sectors. Although FEM includes 4 temporally organized dimensions, this study focused on the 2 dimensions most relevant to understanding the broader life factors that may inhibit healthy lifestyle behaviors in low-income families, Family Ecology and Family Social and Emotional Context. Family Ecology encompasses contextual factors that influence behavior, such as family history and structure, organizational characteristics, community characteristics, and media and policy factors. Family Social and Emotional Context results from the family ecology and includes family knowledge and social norms as well as

social disparities and chronic stress. The other 2 FEM dimensions were omitted because they focus on outcomes rather than determinants of behavior change.

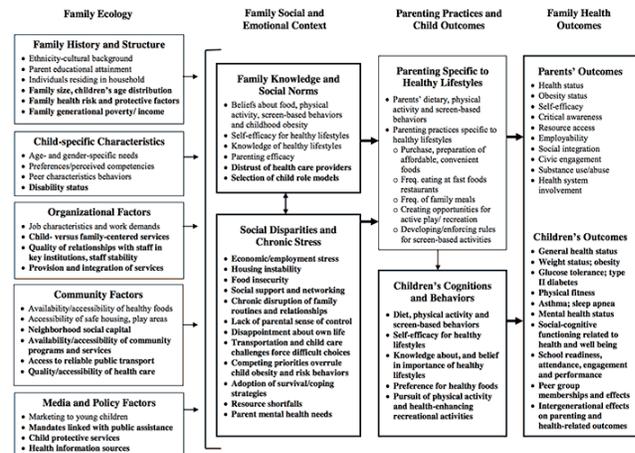


Figure. The Family Ecological Model. Reprinted with permission from Davison KK, Jurkowski JM, Lawson HA. Reframing family-centred obesity prevention using the Family Ecological Model. *Public Health Nutr* 2013;16(10):1861-9.

Methods

Setting

This study is nested in the Massachusetts Childhood Obesity Research Demonstration study (MA-CORD), a multisector community intervention for childhood obesity prevention that is being implemented in 2 low-income Massachusetts communities (17,18). Both communities are small- to mid-size (population 40,000–100,000) with predominantly non-Hispanic white (~68%) and sizeable Hispanic (16%–21%) populations. Mean income per capita is approximately \$22,000 (state average is \$35,000) and rates of poverty range from 23% to 27% (state poverty rate is 12%). MA-CORD includes childhood obesity interventions in 5 sectors, including afterschool programs, schools, health care, WIC, and early education.

Participants

Eligible stakeholders were drawn from the 5 community sectors in both MA-CORD communities. All stakeholders who participated in an introductory meeting about MA-CORD were invited to participate in a semistructured interview. Stakeholders who agreed to participate were sent an email after the meeting. Any stakeholders who did not reply after 3 reminders were counted as nonrespon-

ders. Of 108 stakeholders who were eligible to participate, 71 were from schools, 17 from afterschool programs, 9 from health care, 6 from WIC, and 5 from early education. A total of 63 stakeholders (58.3% of those eligible) agreed to participate in the study, and 39 stakeholders (61.9% of 63) were interviewed.

Interview procedures

All interviews were conducted at baseline, after the organizations agreed to participate in MA-CORD but before the implementation of childhood obesity intervention activities. Some training sessions for stakeholders had already been delivered by the time of the interview. Eight stakeholder interviews were conducted face-to-face and 31 by telephone. Two of the authors (C.G. and A.A.) conducted the interviews from September 2012 through March 2013. To mediate potential differences in interview style, an interview guide was developed, and the first 3 interviews were conducted with both interviewers present. All participants gave permission for audio recording. All procedures were reviewed and approved by the institutional review boards of Harvard School of Public Health and San Diego State University. Stakeholders were compensated with a \$10 gift card.

Data analysis

Interviews were transcribed verbatim and entered into NVivo version 10.0 (QSR International). Data were analyzed through coding and extraction (19). An initial list of codes and definitions was developed on the basis of the Family Ecology and Family Social and Emotional Context domains of FEM (columns 1 and 2 in the Figure). Two investigators (C.G. and R.E.B.) pilot-tested this initial list with 5 randomly chosen interviews, which was refined and expanded to incorporate emergent themes. The investigators then independently coded 5 more interviews with the revised scheme. Disagreements in coding were discussed. A consensus meeting with a third investigator (K.K.D.) was held to finalize the coding scheme. Data analysis focused on the extent to which stakeholder descriptions of barriers experienced by low-income families reflected the experiences of low-income families as documented in the FEM model. Coded data were analyzed for potential differences in stakeholder perceptions and sector.

Results

The 39 stakeholders interviewed represented all sectors of MA-CORD. Fifteen stakeholders were from schools, 8 from afterschool programs, 7 from health care, 6 from WIC, and 3 from early education. Participant characteristics are summarized in Table 1.

Stakeholders described a wide range of barriers affecting healthy lifestyle choices among low-income families. Almost all barriers identified by stakeholders could be categorized within the Family Ecology and Family Social and Emotional Context domains of FEM. We summarized the major themes identified by stakeholders in each of the 2 domains addressed in the model and described differences in stakeholder perspectives by sector, including illustrative quotations (Table 2).

Family Ecology

Family history and structure. Within this subdomain, parent education and ethnicity–cultural background were mentioned by most stakeholders as affecting parents' engagement or participation in childhood obesity prevention. Specifically, 32 (82.0%) out of 39 stakeholders, discussed parent education as a barrier, and 13 (33.3%) out of 39 stakeholders referenced ethnicity–cultural background as shaping cultural norms that could negatively affect parents' engagement in obesity prevention.

The main cultural influence cited by 10 (26%) of 39 stakeholders representing all sectors was Hispanic families' belief that high body weight is healthy. Participants reported that parents whose families recently immigrated to the United States were proud of their "chubby" children, and saw them as evidence of their ability to provide food (Table 2, quotes 1, 2); this concept is important because many families faced food insecurity in their home countries. Five stakeholders (13.0%) mentioned that grandparents' beliefs that heavy babies are healthy also greatly influenced families' daily routines (Table 2, quotes 3–5). Nine stakeholders (23%) from schools, afterschool programs, and health care discussed parents' language and literacy needs, which are examples of parents' ethnic–cultural background and education (Table 2, quotes 6–8). Although stakeholders reported addressing these needs by providing bilingual materials and a translator during appointments, these efforts were described as insufficient for fostering parent engagement (Table 2, quote 9).

Organizational factors. Fifteen stakeholders (39.0%) agreed that childhood obesity is a sensitive topic and that a good relationship between families and staff in key institutions is important when addressing obesity with families. Fourteen stakeholders (36.0%) representing almost all sectors, but especially from WIC, mentioned that health care providers lack the time to adequately address healthy behaviors because of parents' need to discuss competing problems. Cultural competency and provider empathy were also described as playing a role. Additionally, stakeholders stressed that overall health should be addressed rather than overweight or obesity (Table 2, quotes 10–12).

Community factors. The most important community-level barrier reported by 19 (49.0%) stakeholders was the lack of safe neighborhoods. Safety concerns, including high traffic areas, unsafe sidewalks, and fear of violence, were all mentioned as barriers preventing children from going outside to play (Table 2, quotes 13, 14). Sixteen stakeholders (41.0%) across all sectors also described lack of transportation as a barrier. Although afterschool programs and sports clubs were offered free, stakeholders reported that families cannot attend as long as they lack consistent access to transportation (Table 2, quote 15, 16). Finally, 15 stakeholders (39.0%) across sectors mentioned that low-income families do not have access to affordable, healthful food (Table 2, quotes 17, 18).

Media and policy factors. Seven stakeholders identified media and policy factors, specifically marketing, as a barrier. For example, stakeholders mentioned that advertisements are confusing and irritating and perpetuate the misconception that healthful eating is expensive (Table 2, quotes 19, 20).

Family Social and Emotional Context

Family knowledge and social norms. Thirteen stakeholders (33.0%) named different beliefs about food and physical activity as a barrier. For example, limited nutrition knowledge makes it more difficult for parents to make healthy food decisions (Table 2, quotes 21–23); another perceived barrier is parents' belief that any activity except television viewing is physical activity (Table 2, quote 24). Stakeholders noted that asking parents more detailed questions about their children's physical activity often revealed that parents did not actually know what physical activity meant. Consequently, stakeholders reported changing their counseling sessions to include examples of physical activity and different strategies for increasing children's heart rate through physical activity. A total of 26 stakeholders (67.0%) mentioned that parents are often unaware or unconcerned about their child's weight and do not engage in specific efforts to address obesity in their families. Stakeholders from WIC, health care, and early education reported that parents generally do not see weight gain as a problem (Table 2, quotes 25–26). Additionally, 1 WIC stakeholder said that parents believe that the products distributed through the WIC voucher program (eg, juice, milk, breakfast cereals, cheese, fruits and vegetables, peanut butter [20]) are healthful, and therefore, believe they can consume as much as they want (Table 2, quote 27).

Eight stakeholders (21.0%), mainly from WIC, reported parental distrust in stakeholders' knowledge related to nutrition, physical activity, and body weight, especially if the child's doctor did not address weight problems (Table 2, quote 28). Furthermore, 5 stakeholders (14.0%) felt that parents often saw advice related to their children's weight as an intrusion into the way they raise their children (Table 2, quotes 29, 30). Several stakeholders also noted

that parental distrust may stem from parents observing organizational staff consuming unhealthful foods and having weight problems themselves (Table 2, quote 31).

Social disparities and chronic stress. A total of 34 stakeholders (87%), identified families' economic situation, that is, their inability to afford healthful foods and attendance fees, as a significant barrier to healthy lifestyles. Stakeholders reported that low-income families tended to use the support they get through the Supplemental Nutrition Assistance Program to buy cheaper, less healthful foods to be able to afford more food (Table 2, quotes 32–34). Linked to families' economic situation are competing priorities that overrule child obesity and health-risk behaviors. More than half of all stakeholders (22 [56%]), mentioned that families experience competing priorities (eg, homelessness, addiction, food insecurity, being uninsured). Stakeholders said that low-income families would consume whatever food they could afford regardless of whether it was healthful (Table 2, quotes 35, 36). Nine stakeholders from health care and WIC said that many parents lacked of a sense of control over, and responsibility for, their child's weight (Table 2, quote 37).

Differences by sector

Although there was general cross-sector agreement on barriers parents encounter in obesity prevention, a few differences emerged. Of 16 stakeholders who identified lack of transportation as a barrier, 6 were from the afterschool sector (38%). Half of all stakeholders (4 of 8, 50%) who reported parental distrust in the providers nutritional knowledge, especially when addressing children's weight problems, were from WIC. Eight of 13 stakeholders (62.0%) who identified cultural influences as a barrier to obesity prevention were from WIC and health care. Finally, 9 of 15 stakeholders (60%) who cited the quality of the relationship between families and staff in key institutions as influential to successfully engaging parents in obesity prevention efforts were from WIC and health care.

Discussion

Multisector interventions are recommended to prevent obesity in children. The success of such interventions requires not only that stakeholders are sensitive to the challenges experienced by low-income families in the context of obesity, but that there is congruence across sectors in stakeholders' understanding of these challenges. Results from this study illustrate that stakeholders participating in MA-CORD have an intricate understanding of barriers to obesity prevention and control experienced by low-income par-

ents. Stakeholder reports reflected awareness of the broader contextual factors affecting families in addition to social and emotional dynamics within families that could cause families to engage in obesity prevention.

Although stakeholder reports generally overlapped with FEM, numerous key areas not specifically highlighted in FEM were mentioned. Examples include parents' language or literacy levels and the cultural competency and empathy of health care providers, which include the use of acceptable terminology when discussing a child's weight. These themes are distinct from constructs referenced in FEM, such as parents' ethnicity-cultural background, quality of relationship with staff, and parents' distrust of health care providers, and they have implications for intervention approaches. For example, stakeholders acknowledged that having materials in Spanish and offering translator services was insufficient to improve provider-parent communication. The challenges extended beyond parent cultural background and the general provider-parent relationship and probably involved parents' health literacy levels and provider and organizational levels of cultural competency, thus highlighting the need to emphasize these subdomains in future applications of FEM.

Another important finding that emerged is the role that extended family members such as grandparents play in food selection and a child's weight, especially in Hispanic families (21,22). Although the role of extended family members is subsumed in ethnicity-cultural background in FEM, it may not be sufficiently emphasized. Previous research illustrates that grandparents have a strong caregiving role in Hispanic families (23). In our study, community stakeholders repeatedly mentioned the effect that grandparents had on their ability to communicate healthy lifestyle practices to parents. Stakeholders also mentioned that parents acquire their knowledge of nutrition from their own parents. These results underline the importance of explicitly including extended family members in childhood obesity prevention and control when working in communities with a large number of Hispanic families.

Results from this study have numerous implications for practice. First, results suggest that stakeholders, particularly stakeholders focusing on childhood obesity prevention, may be appropriately aware of the challenges experienced by low-income families in the context of obesity prevention; thus, attempts to increase stakeholders' awareness through education may not be a good use of resources. Resources could be directed toward increasing parents' health literacy levels, ensuring organizational cultural competency, and explicitly including extended family members in health promotion. Findings also iterate the importance of addressing contextual

and family-level barriers when planning and conducting new interventions. Offering free programs at times parents are unable to participate with their children or when no transportation is available limits participation.

This study has numerous strengths. Community stakeholders play important roles in multisector obesity interventions, but to date they have not been emphasized in research in this area. To the best of our knowledge, this is the first study to examine key stakeholders' perceptions of barriers to engaging low-income families in childhood obesity prevention across multiple community sectors. An important aspect of this study is the inclusion of stakeholders representing 5 community sectors. The use of a qualitative approach also provided the opportunity to delve more deeply into stakeholders' views regarding facilitators and barriers to obesity prevention. Although interview questions were broad and open-ended and did not explicitly prompt theoretical constructs, results were highly consistent with the underlying theoretical model, lending further credibility to the results.

Despite these strengths, there are also numerous limitations, which need to be considered when interpreting the results. Because the study was nested within MA-CORD, stakeholders may have already had a strong interest in childhood obesity and may not represent stakeholders in other low-income communities. In addition, some intervention sectors were underrepresented; therefore, study findings may not fully represent the views of all stakeholders in these communities. Finally, stakeholder training had been initiated in some sectors at the time of the interviews. Although training sessions did not focus on barriers to obesity prevention experienced by low-income families, they may have increased stakeholder awareness of childhood obesity, thereby influencing interview responses.

This study adds to the literature by capturing the perceptions and experiences of key stakeholders across community sectors regarding barriers that low-income parents encounter when engaging in childhood obesity prevention. Findings illustrate stakeholders' holistic awareness of the complexity of factors affecting families in the context of childhood obesity prevention and the consistency of those perspectives across community sectors. These results are encouraging because they suggest that some of the fundamental building blocks of multisector interventions for obesity prevention for vulnerable children and their families may already be in place. Resources may be more appropriately directed toward increasing parents' health literacy levels, ensuring organizational cultural competency, and explicitly including extended family members as program targets in health promotion.

Acknowledgments

This research was supported by the Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, award no. U18DP003370, and by the Pilot Studies Core of the Johns Hopkins Global Obesity Prevention Center, which is funded by the National Institute of Child Health and Human Development, no. U54HD070725. The authors thank the community participants, Jo-Ann Kwass for connecting us to the communities, the MA-CORD coalition leaders in both communities, and the MA-CORD project team.

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Tables

Table 1. Characteristics of Participating Community Stakeholders (N = 39), Study of Community Stakeholders' Perceptions of Barriers to Childhood Obesity Prevention for Low-Income Families, Massachusetts, 2012–2013

Stakeholder Characteristic	N (%)
Community sector	
Primary health care	7 (18.0)
Special Supplemental Nutrition Program for Women, Infants and Children	6 (15.4)
Schools	15 (38.5)
Afterschool programs	8 (20.5)
Early care and education	3 (7.7)
Organizational role	
Implementer	30 (76.9)
Program leader	9 (23.1)
Participation rate	
Invited to participate	108 (100.0)
Agreed to be interviewed	63 (58.3)
Completed interviews	39 (61.9)
Sex	
Female	36 (92.3)
Male	3 (7.7)
Age, y	
18–29	5 (12.8)
30–39	9 (23.0)
40–49	11 (28.2)
50–59	12 (30.8)
≥60	2 (5.1)
Ethnicity	
Hispanic	5 (12.8)
Not Hispanic	34 (87.2)
Race	
White	33 (84.6)
Asian	2 (5.1)
African American	1 (2.6)
Unknown	3 (7.7)
Interview length, min	
Average	24
Shortest	10
Longest	64

Table 2. Study of Community Stakeholders' (N = 39) Perceptions of Barriers to Childhood Obesity Prevention for Low-Income Families, Massachusetts, 2012–2013: Quotes Illustrating Opinions, by Theoretical Domain

Family Ecological Model Construct Category, n (%) ^a	Community Stakeholder Sector	Quote
Family Ecology		
Family history and structure: ethnicity-cultural background, 32 (82%)	Primary health care	1. "Particularly immigrant families . . . they're impoverished here but they were even more impoverished back home, um, that you know there's a certain amount of pride in being able to feed your child and have a chubby little kid. And I think that's a real challenge, to get past that you know, a chubby kid is a healthy kid concept that I think many of our immigrant families have."
	WIC	2. "You know, fat babies are healthy babies in the Spanish culture."
	WIC	3. "The grandparents want the grandchild to be plump. You know. Um, so it's a lot of I think a lot has to do culturally. They want that child to be large and big and plump."
	Primary health care	4. "The grandparents are a big issue in terms of undermining some of the efforts to get a child to a healthy weight."
	Afterschool programs	5. "As we were talking about it [food intake], his grandmother was sitting next to us, and she interrupted us and she said: 'He's a bambino. He needs to be able to eat whatever he wants.'"
Family history and structure: parent educational attainment, 13 (33%)	Primary health care	6. "We also have families that have parents that don't read or write. Most of the information sometimes we give out, it's all written material."
	Primary health care	7. "I always knew that the literacy level was low within our population but that just underscored it by the number of patients who even though we have the forms in both English and Spanish cannot complete the form. So there's a fairly significant number of people who do not read, or read at a very low grade level in terms of the parents . . . If you have patients who can't read they are not going to be able to look at the nutrition information on a food item."
	School	8. "Sometimes people . . . [are] English language learners because they can't speak, you know I would say a lot of Spanish families don't really get involved. Not that they don't care about their children but because of the communication."
	Afterschool programs	9. "I offered a nutritional class, and . . . everything I did was in English and Spanish, and I had a Spanish translator come in. All my handouts were in Spanish and English . . . and no one showed up. None of the parents came in, none of them. There are so many obstacles in the city."
Organizational factors: quality of relationship with provider, ^b 15 (39%)	School	10. "Basically the challenge is not to get them defensive. And to have them feel that I'm on their side . . . I'm not trying to be critical. That is a big challenge. Because it's a very sensitive issue."
	Afterschool programs	11. "It is a reality check and not many people can handle that."
	WIC	12. "So if you talk more about health than about being overweight then I think they are more receptive, because you're not targeting them personally."
Community factors: accessibility of safe housing, play areas, 19 (49%)	Childcare	13. "I think its activity, I think a lot of it is parents are afraid to let their children go out and play."
	Primary health care	14. "First is availability of safe physical activity. There are certain areas of [community name] where parents rightly so don't want their kids going outside to play. There may not be safe spaces for them to play and in terms of the way traffic and things. But beyond that there is significant gang gun violence in our city as well."

Abbreviation: WIC, Special Supplemental Nutrition Program for Women, Infants and Children.

^a Values are the number and percentages of stakeholders who addressed the FEM construct.

^b Providers are any stakeholders who provide health information.

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Table 2. Study of Community Stakeholders' (N = 39) Perceptions of Barriers to Childhood Obesity Prevention for Low-Income Families, Massachusetts, 2012–2013: Quotes Illustrating Opinions, by Theoretical Domain

Family Ecological Model Construct Category, n (%) ^a	Community Stakeholder Sector	Quote
Community Factors: Access to reliable public transport, 16 (41%)	Primary health care	15. "Almost nobody I take care of has a car. When you say, 'Join the soccer league,' they are like, 'In your dreams.'"
	School	16. "Transportation, you know to get them to take them. You can offer a free program, that's great, but can the families get there."
Community factors: availability or accessibility of healthful and unhealthful foods, 15 (39%)	Early care and education	17. "We actually only have three grocery stores . . . for a large city that's a very small number. . . . It's those convenience stores that are on the corners and are near the housing. . . . They are offering candy and chips and everything else, and where are the fruits and the vegetables and everything else that we preach about? But they [parents] don't have the accessibility to find and even purchase some of those items."
	School	18. "They [parents] are trying to feed what's affordable, and sometimes what's affordable isn't always the best choice."
Media and policy factors: marketing, 7 (18%)	Afterschool programs	19. "I think the first one that always comes to mind, parents find or there is almost a false perception that healthy eating is expensive. You know there are ways to work around that, to get foods that are healthy and inexpensive but I think as a society we've made it out to be that healthy foods are, they're expensive. You have to go to Whole Foods and you have to spend \$10 on apples like I mean, it's there is that sort of perception. So I think that's the biggest barrier for families is they think that they can't, they don't have the funds for it."
	Early care and education	20. "I think the parents, I think a lot of them don't know, they um, you know, they see advertisements and everything looks healthy and natural and they're not."
Family Social and Emotional Context		
Family knowledge and social norms: knowledge of healthy lifestyles, 13 (33%)	School	21. "I don't think the parents understand what obesity is because they're obese, so they need to be educated on how to make healthy meals and stuff."
	School	22. "If parents understand how they can make substitutions in the diet in a way that's economical, so that they can afford to put better nutritious meals on the table, parents would do that. Particularly when they understand the connection between what the children eat and their overall health and well-being."
	Primary health care	23. "They know McDonald's is not good, but they don't know what they are buying at home also seem as McDonald's. They know fast food is not good, but they don't know exactly what food is fast food, what food is . . . the healthier one."
Family knowledge and social norms: beliefs about food, physical activity, screen-based behaviors, 13 (33%)	WIC	24. "I think they think that anything besides watching TV is physical activity."
	Early care and education	25. "I can count literally on one hand how many times a parent or a family member has come up to us, or me particularly, and said, 'All right, I'm concerned about my child's weight.' So that doesn't happen frequently at all, but it has happened."
	Afterschool programs	26. "No, our parents really don't seem concerned because no parents ever called or anything seeing about the physical activities that we do at our program. They know that we do them, but nobody ever comes with concerns, especially about their child."
Family knowledge and social norms: knowledge of healthy lifestyles, 13 (33%)	WIC	27. "They [parents] are thinking that WIC juice is OK They are thinking that there is . . . good juice and bad juice. . . . They are thinking if it's good juice they can have it all the time."

Abbreviation: WIC, Special Supplemental Nutrition Program for Women, Infants and Children.

^a Values are the number and percentages of stakeholders who addressed the FEM construct.

^b Providers are any stakeholders who provide health information.

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Table 2. Study of Community Stakeholders' (N = 39) Perceptions of Barriers to Childhood Obesity Prevention for Low-Income Families, Massachusetts, 2012–2013: Quotes Illustrating Opinions, by Theoretical Domain

Family Ecological Model Construct Category, n (%) ^a	Community Stakeholder Sector	Quote
Family knowledge and social norms: distrust of health care providers, 8 (21%)	WIC	28. "And we are like the bad guys . . . and they [parents] don't want to hear anything about nutrition, anything about overweight. Because you are talking about something the doctor doesn't even mention."
	Primary health care	29. "The feedback I was getting was that: 'School is for education, why the nurses concern about my child's weight?'"
	WIC	30. "If the doctor doesn't say anything, then they certainly don't want to hear it from us."
	Primary health care	31. "When she [a 12 year old girl] came in, she took a scan of some of the staff and said: 'How can you tell me to be healthy when your staff look like that?'"
Social disparities and chronic stress: food insecurity, 34 (87%)	Primary health care	32. "How was I gonna take that mom and the child . . . up to the nutritionist and tell her how healthy she should be eating when they don't have any food?"
Social disparities and chronic stress: economic or employment stress, 34 (87%)	Afterschool programs	33. "When you're on a fixed income and you only have so much money in food stamps you buy what you can. It's probably not the most healthy choices."
	Primary health care	34. "Then even small amounts of money are huge hurdles for these guys, you know? The entrance fee for the town soccer league is overwhelming."
Social disparities and chronic stress: competing priorities, 22 (56%)	School	35. "They're not thinking about what a nutritional meal's going to be. They don't think about nutritional meals. They're thinking about finding a meal."
	Primary health care	36. "Families who are just trying to figure out a place to live and a way to make any kind of money to make ends meet are just not . . . they don't have the energy to be concerned about this issue."
Social disparities and chronic stress: lack of parental sense of control, 9 (23%)	Primary health care	37. "We see these new patients coming in and this is: 'Oh, I'm coming in because . . . the pediatrician told me that my child was overweight.' . . . and then the parents are bringing the child thinking the visit is just gonna be for the child."

Abbreviation: WIC, Special Supplemental Nutrition Program for Women, Infants and Children.

^a Values are the number and percentages of stakeholders who addressed the FEM construct.

^b Providers are any stakeholders who provide health information.

6.2 Publication 2 – Post print:

Community Stakeholders' Perceptions of Major Factors Influencing Childhood Obesity, the Feasibility of Programs addressing Childhood Obesity, and Persisting Gaps

Citation: The final publication is available at Springer via <http://dx.doi.org/10.1007/s10900-015-0097-y>

Ganter C, Aftosmes-Tobio A, Chuang E, Blaine RE, Land T, Davison KK. Community stakeholders' perceptions of major factors influencing childhood obesity, the feasibility of programs addressing childhood obesity, and persisting gaps. *Journal of Community Health*. (2015) Oct. 3. (DOI) 10.1007/s10900-015-0097-y

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My contribution to the publication:

I contacted stakeholders to ask for interview participation. A colleague (AA) and I conducted the interviews, either in person or over the phone. I transcribed some interviews and organized transcription with a professional transcription company (Landmark Associates Inc.). I reviewed the transcribed interviews for accuracy and entered the transcripts into NVivo QSR 10.0, software for analyzing qualitative data. A colleague (AA) and I coded five randomly chosen interviews to develop a coding framework and with this framework, five more interviews were coded by the two coders. A consensus meeting was held (AA, CG, KKD) to discuss coding and disagreement and a final coding framework was developed. All transcripts were double coded using this framework. After coding, I analyzed the interview data and summarized the results. Results were discussed with KKD. I drafted the paper for publication and edited co-author comments.

Results were presented at the International Society of Behavioral Nutrition and Physical Activity conference in San Diego, USA, 2014.

Community stakeholders' perceptions of major factors influencing childhood obesity, the feasibility of programs addressing childhood obesity, and persisting gaps

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Abstract

Purpose: Prior research has identified numerous factors contributing to increased rates of childhood obesity. However, few studies have focused explicitly on the experience of community stakeholders in low-income communities. This study sought to capture the perspectives of these on-the-ground experts regarding major factors contributing to childhood obesity as well as gaps in current prevention and control efforts.

Methods: We conducted semi-structured interviews with 39 stakeholders from different community sectors (e.g., healthcare providers, childcare providers, teachers). Data were drawn from the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) project, a multi-level, multi-sector intervention designed to reduce childhood obesity being implemented in two low-income communities in Massachusetts. Interviews were conducted at baseline, transcribed, coded using grounded theory approach, and analyzed in NVivo 10.0.

Results: The vast majority of stakeholders had recently participated in obesity prevention strategies, and nearly all of them identified gaps in prevention efforts either within their organizations or in the broader community. In addition to factors previously identified in the literature, several themes emerged including the need to change policies to increase physical activity during school, offer healthier snacks in schools and afterschool programs, and increase communication and collaboration within the community in prevention efforts.

Conclusion: Community stakeholders can impact the success of interventions by bridging the gap between science and lived experience. The results of this study can guide future research by highlighting the importance of including stakeholders' frontline experiences with target populations, and using information on identified gaps to augment intervention planning efforts.

Key words:

Childhood obesity prevention

Qualitative research

Community stakeholder

Community health

Policy changes

Introduction

Despite increased efforts to prevent child overweight and obesity, obesity rates significantly decreased only in preschoolers [1]. Research has shown that overweight and obesity tend to be more prevalent among children with low socio-economic status and among racial/ethnic minorities, particularly Hispanics [2, 3]. To more effectively prevent and control overweight and obesity in these target groups, current prevention models increasingly emphasize multi-sectorial, multi-disciplinary, and culturally-relevant approaches [4-10] that change not only individual behavior but also the broader environment in which children and their families live.

The success of these new models is dependent on their ability to include and engage representatives from multiple sectors, e.g., healthcare practitioners, early care and education staff, teachers, and staff working with public health agencies and/or community programs [4, 11]. These stakeholders are well-positioned to influence both children's and their families' lifestyle choices and can significantly affect the outcomes of childhood obesity prevention programs and initiatives. Understanding these stakeholders' perspectives regarding childhood obesity prevention programs is therefore essential in the planning and implementation process [4].

However, while many childhood obesity interventions have been evaluated against child weight-related outcomes [12], stakeholders' opinions about these interventions have received little attention. The authors of a recent Cochrane review of childhood obesity interventions pointed to the need for qualitative research to provide a better understanding and view of stakeholders' and families' opinions regarding prevention programs that may be more or less successful in their communities [10]. Qualitative approaches add to existing behavioral and epidemiological evidence as they open the possibility to tailor interventions to individual and

community needs [13]. Yet, few studies have focused explicitly on the knowledge and experiences of diverse stakeholders, as well as the gaps in prevention that they identify within their communities. Moreover, stakeholders' perspectives on the feasibility of organization specific and community-wide strategies have not been widely addressed in prevention research.

To address this gap, we explore the perspectives of stakeholders from multiple community sectors (primary healthcare, schools, after school programs, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and early care and education) from two low-income communities implementing the Massachusetts Childhood Obesity Research Demonstration project (MA-CORD) [14, 15], a multi-level, multi-sector childhood obesity intervention. Interview questions solicited stakeholders' perspectives on: 1) major factors contributing to childhood obesity in these communities, 2) the feasibility of past obesity prevention strategies in their community; and 3) gaps in past and current childhood obesity prevention and control efforts.

Methods

Setting

The current study is nested within MA-CORD, which is described in detail elsewhere [14, 15]. Briefly, the MA-CORD project is a multi-level, multi-sector community-based intervention to prevent and control childhood obesity among underserved children aged 2-12 years. Interventions were implemented in two low-income, small- to mid-size (population 40,000-100,000) communities in Massachusetts. In both communities, the population is predominantly non-Hispanic white (~68%) and Hispanic (16-21%). The mean per capita income is \$22,000, which is below the state average of \$35,000, and the poverty rate is 23-27%, which is

twice as high as the state-level poverty rate. The community sectors included in the MA-CORD project are: afterschool, school, WIC, primary healthcare, and early care and education (from now on referred to as healthcare and early education).

Participants

In both communities, eligible stakeholders were responsible for either leading (e.g., school principals, medical and program directors) or implementing (e.g., teachers, afterschool and early education staff) MA-CORD study components. At baseline, multiple introductory meetings were held to provide an overview of the MA-CORD project. Stakeholders who attended one of these meetings were invited to participate in a semi-structured interview. All stakeholders who agreed to be contacted were sent an email to schedule the interview (with up to two follow-up emails). Stakeholders who did not reply after a third reminder were counted as non-responders. In total, 63 of 108 stakeholders (58.3% of those eligible) agreed to be interviewed, and a total of 39 (61.9% of 63) participated in the interview.

Interview procedure

Stakeholders were interviewed between September 2012 and March 2013. Although some project participation training sessions had taken place by this time, the interviews were conducted before any intervention components had been implemented. Two researchers (A.A., C.G.) conducted the interviews either in-person (n=8) or by phone (n=31). To ensure consistency, three interviews were conducted with both researchers present. Differences in interview style were discussed afterwards. To ensure standardization of interview procedure, a semi-structured interview guide was developed. Key topics included identifying: 1) the

population(s) stakeholders work with; 2) major factors leading to childhood obesity in the community; 3) strategies for obesity prevention that stakeholders were already engaged in (prior to MA-CORD); 4) the most feasible of those strategies; and 5) strategies still needed, which stakeholders felt could be successful in their community. All participants reviewed the consent form and gave permission for audio recording. At the end of the interview, a brief survey was administered to collect demographic data (e.g. age, gender, race/ethnicity). The average time of the interviews was 24 minutes, with a range of 10 – 64 minutes. All procedures were reviewed and approved by the institutional review boards of Harvard T.H. Chan School of Public Health and San Diego State University. Stakeholders received a \$10 gift card as compensation.

Data analysis

Interviews were audio recorded and transcribed. The transcripts were reviewed by study personnel (C.G., R.B.) for accuracy, and entered into NVivo QSR 10.0 (QSR International Pty Ltd., Doncaster, Victoria, Australia). A grounded theory approach was utilized to analyze the data [16]. The two interviewers (AA, CG) independently coded five randomly selected transcripts to document emergent categories and possible subcategories. Categories were discussed between the coders to develop a preliminary coding scheme. With this scheme, five more interviews were coded independently, and coding was discussed to resolve disagreements. A consensus meeting with a third investigator (KKD) was held to finalize the coding scheme, and all interviews were double coded with this scheme. Data analysis focused on stakeholders' perspectives about major factors contributing to childhood obesity in their community, the feasibility of past obesity prevention strategies implemented in their community, and gaps in current childhood obesity prevention and control efforts.

Results

Interviewed stakeholders (n=39) represented all sectors of MA-CORD. The majority of stakeholders were from schools (N=15). Stakeholders were also recruited from afterschool programs (N=8), primary healthcare (N=7), WIC (N=6), and early care and education centers (N=3). More detailed demographic information is presented in Table 1. Stakeholders reported a wide range of factors that they saw influencing childhood obesity in their communities, and provided suggestions for organization- and community-level strategies to prevent and control childhood obesity. Illustrative quotes are provided in Table 2.

Major factors influencing childhood obesity in the community

Stakeholders' reports included individual- and societal-level factors associated with high rates of childhood obesity in their community, which, overall were consistent with an ecological perspective on obesity prevention. The most frequently mentioned factors were a lack of physical activity (PA) and an increase in sedentary behaviors (62%) among children and their families (quotes 1-3). Stakeholders from each sector cited low socio-economic status (54%) as a factor impacting the success of prevention efforts, and as contributing to low program attendance and a lack of healthy nutrition in families (quotes 4, 5). Almost half of all stakeholders (46%) named access to healthy and affordable food as a problem (quote 6), and 12 (31%) stakeholders, mostly from the school and healthcare sectors, mentioned lower education in families as a factor contributing to high childhood obesity rates (quote 7). Stakeholders from each sector also named a lack of community resources (28%), such as transportation and programming (quotes 8,9) and cultural influences (21%), particularly the food preferences and norms of Hispanic cultures, as

factors that also lead to an increase of childhood obesity in their community (quotes 10, 11).

Another important factor is a lack of neighborhood safety (quote 12), seen by several stakeholders (33%) as contributing to increased sedentary behaviors.

Strategies related to childhood obesity prevention and most feasible of these strategies

To determine the feasibility of strategies to prevent and control childhood obesity we targeted our questions to focus on programs implemented in the organization or community prior to the MA-CORD project. We then asked stakeholders which programs and strategies were most feasible. The majority of stakeholders cited nutrition- or PA-related strategies (54%) as being most feasible. Stakeholders from school, afterschool, and early education sectors found changing their organizations' policies around food to be the easiest strategy to catalyze change. For example, stakeholders described the transition to healthy lunches according to "My Plate" [17] as a very positive and successful change (quote 13). Furthermore, changes to school food policy, in particular banning unhealthy foods for classroom celebrations, switching from soda and chocolate milk to water, and eliminating the vending machines, were seen as successful, feasible, and easy to implement (quote 14-17). Stakeholders from schools, WIC, early education, and in particular afterschool (44%), had targeted increasing PA, for example through walking programs and the use of special fitness equipment (quotes 18-20). Stakeholders from the school and afterschool sectors mentioned that adding more activity into the school day and afterschool programs was another simple way to improve wellness, not only because the children had fun and enjoyed the chance to be active (quote 21), but also because no extra staff were needed to implement these changes (quote 22). More than half of the stakeholders (54%) across sectors tried to implement diverse strategies specifically to address parents, in order to communicate the importance of childhood obesity to parents (e.g., organized phone calls, sending home handouts

and newsletters, quotes 23, 24). According to stakeholders, calling parents was not only an effective way to deliver information about school activities, but also to address diverse problems. Sending home handouts and newsletters was an easy way for stakeholders to communicate to parents although stakeholders were not sure how successful this strategy is when trying to reach out to parents.

Missing prevention strategies: Organizational level

When asked about organizational-level strategies that could be successful but were currently lacking, stakeholders across all sectors mentioned the importance of several specific PA (44%) and nutrition (44%) strategies. Specifically, stakeholders pointed to a need for increased PA during the school day, access to physical education (PE) classes, hiring more PE teachers, and increasing activity options (e.g., recess, afterschool options, quotes 25-28). A few stakeholders from school, early education, and the clinic sector (13%) went so far as to suggest policy mandates around PA, specifically requiring recess and P.E., would be a much needed change (quotes 29-32). Stakeholders (44%) pointed to a need for increasing the offering of healthy foods both during school and afterschool (quote 33), and either removing vending machines, or replacing the typical snacks with healthy ones (quotes 34, 35). Across all sectors, stakeholders (21%) agreed on the importance of doing more to target parents; examples included offering parenting classes and home visitation programs (quotes 36-39).

Missing prevention strategies: Community level

When asked what may be missing from community-level prevention strategies, the approach mentioned most frequently by stakeholders (41%), was improved and increased cross-

sector collaboration and communication in the community. Stakeholders saw the efforts of other organizations as opportunities for collaboration, rather than competition (quotes 40-42).

Stakeholders from all sectors but WIC (28%) demanded the inclusion of the whole family and specifically mentioned increasing family-oriented outdoor programs to get children out of the house and away from watching television, educating and informing parents about wellness; and involving parents by bringing solutions into the families' homes (quotes 43-45). Stakeholders (16%), especially from schools also mentioned the need for more PA opportunities available to the larger community (e.g., offering safe routes to school or promoting newly cleaned local parks for outdoor activities, quote 46).

Differences by sector

Overall, there was general agreement across sectors on the major factors influencing childhood obesity in the community. Few differences were identified for stakeholders from different sectors regarding the most feasible obesity prevention strategy to implement. Of 21 stakeholders who identified nutrition- and PA-related strategies as most feasible to implement, the majority of stakeholders were from the school and afterschool sector (15 of 21, 71%). When asked about strategies that were still needed in their organization, mostly stakeholders from schools (67% versus $\leq 33\%$ from other sectors) named PA-related strategies. In regard to missing strategies in their community, stakeholders from all sectors but WIC mentioned collaboration and communication and family-related programs as the most needed strategies. PA-related strategies in the community were mentioned by stakeholders from school, afterschool, and healthcare, but not by stakeholders from WIC and early education.

Discussion

Prevention interventions focused on childhood obesity rarely measure or explore stakeholders' opinions regarding strategies or the problem as it presents within their community. Qualitative research can help provide a better understanding of why prevention programs may or may not be successful [5, 10, 18]. The direct involvement of stakeholders (*i.e.*, teachers, afterschool teachers, early care and education staff, WIC staff, and healthcare staff) with children and their parents makes them key to provide practical evaluations of program efforts, and highlights the importance of their experiences. This qualitative study is the first to interview on-the-ground-experts across different sectors about major factors contributing to childhood obesity, the feasibility of past childhood obesity prevention strategies, and persisting gaps in prevention efforts. The most noteworthy findings of this study were stakeholders' wish for nutrition and PA related policy changes as well as the call for more collaboration and communication across sectors when implementing strategies to combat childhood obesity. WIC was the only sector not asking for more cross-sector collaboration, which could be because WIC staff already works closely with other stakeholders, *i.e.*, hospitals and community centers [19]. Furthermore, stakeholders' named factors contributing to childhood obesity in their community which were consistent with previously published data [20-24].

Stakeholders, particularly from the afterschool and school sectors, found the reduction of PA time (*i.e.*, recess and PE classes) during the school day problematic. Stakeholders across sectors stated that more PA options during the day are greatly needed for children, despite the bureaucratic hurdles this might entail. Stakeholders agreed this would be an easy and feasible strategy since, in their experience, children generally "love to run around" and activities related to play and sport had high attendance. This finding supports prior research [25] which has shown

that the most successful childhood obesity intervention strategies entailed some PA component. Stakeholders mentioned a general feeling within schools and afterschool that there just isn't enough time to include PA within the school day, often pointing to the need to spend that time studying to achieve higher test scores. But stakeholders from this study and others argue that a lack of PA actually decreases test scores [26]. Getting leadership on board when implementing intervention strategies, seems to be an important first approach to gain the necessary support to successfully increase PA options for children during the school day.

Stakeholder opinions about the feasibility of past and recent prevention strategies are an important finding that has rarely been described in previous literature. We found that making changes to food policy was one of the easiest strategies for stakeholders to implement, because it affects an entire organization or community at once; changes are easier to adapt when everyone is on board, and changes to policy have been shown to be sustainable [18]. As reported by stakeholders, it is important to consider not only the prohibition of unhealthy foods and drinks in policies, but also their replacement with healthier options. Substituting healthier options allows children and staff to become accustomed to the new options, and may encourage preference for the new choices over the old options (*i.e.*, water over chocolate milk and soda).

Stakeholders across all sectors also called for more communication and cross-sector collaboration. To our knowledge this is a novel finding that has not been reported in prior research. Stakeholders noted that although organizations typically work independently from each other, they are often trying to achieve the same goals. Stakeholders felt that successes could be increased through collaboration, and by learning from each other's experiences. This finding supports the call for coordinated multi-sector and multi-disciplinary approaches rather than implementing a series of solo interventions in different sectors [4, 18].

Strengths and limitations

Community stakeholders play an important role as on-the-ground-experts in multi-sector obesity interventions. Yet, their experiences and opinions have not been emphasized much in the literature. An important aspect of this study is the inclusion of stakeholders representing five community sectors. Additionally, the use of a qualitative approach provided the possibility to delve more deeply into stakeholders' views regarding reasons for the increase of childhood obesity in their community and strategies still needed. Interview questions were broad and open-ended, which gave stakeholders the opportunity to address every topic individually, and expound upon those important to them.

This study also has limitations which need to be considered when interpreting the results. Since this study was part of the MA-CORD project, stakeholders may have already had some interest in childhood obesity and consequently might not represent stakeholders in other low-income communities. Furthermore, the early education sector was underrepresented and therefore, study results may not fully represent the views of all stakeholders. Finally, this study focused on a specific low-income region in the north east of the U.S., and therefore results might not be applicable to other low-income communities.

Since there exist only a few effective strategies which help overweight and obese children and adults to lose weight and to maintain a healthier weight [20, 21], prevention strategies are still key. Our study results are encouraging because they show that some important strategies may already be in place to prevent and control childhood obesity. Resources may be more appropriately directed toward increasing policy changes and increasing cross-sector

communication and collaboration, which could affect whole organizations and/or communities, helping community interventions to progress even further.

Acknowledgements and Funding

This research was supported by the Centers for Disease Control and Prevention (CDC) National Center for Chronic Disease Prevention and Health Promotion (Award#U18DP003370) and by the Pilot Studies Core of the Johns Hopkins Global Obesity Prevention Center, which is funded by the National Institute of Child Health and Human Development (U54HD070725). The authors thank the participants, Jo-Ann Kwass, Meghan Perkins, and Katie Giles for connecting us to the communities, the MA-CORD coalition leaders in both communities, and the MA-CORD project team.

Conflict of Interest:

The authors declare that they have no conflict of interest.

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Table 1: Characteristics of participating stakeholders (N=39)

Stakeholder Demographics	N (%)
Community sector	
Primary health care	7 (17.9)
Special Supplemental Nutrition Program for Women, Infants and Children	6 (15.4)
School	15 (38.5)
Afterschool programs	8 (20.5)
Early care and education	3 (7.7)
Total	39 (100)
Organizational Role of Stakeholder	
Implementer	30 (76.9)
Program leader	9 (23.1)
Sex	
Female	36 (92.3)
Male	3 (7.7)
Age, years	
18 – 29 years	5 (12.8)
30 – 39 years	9 (23.0)
40 – 49 years	11 (28.2)
50 – 59 years	12 (30.8)
60 or older	2 (5.1)
Ethnicity	
Hispanic	5 (12.8)
Not Hispanic	34 (87.2)
Race	
White	33 (84.6)
Asian	2 (5.1)
African American	1 (2.6)
Unknown	3 (7.7)

Table 2: Illustrative quotes from community stakeholders

Research aim	Community Stakeholder Sector	Quote
Major factors influencing childhood obesity in the community	School	1. “I’ve been teaching physical education for quite a long time and in 1995 when we removed the time mandate for physical education classes it allowed for local districts to start eliminating and greatly reducing the amount of PE [physical education]. So back in that time I knew that this [increasing prevalence of childhood obesity] would happen. So it was something that was very frustrating because they took physical education out of the occasion and went toward testing and became very rigorous to ELA [English, Language, Art] and math to the elimination of any sort of recess and any sort of physical education.”
	Early Care and Education	2. “Low income families can’t afford that [program attendance fees]. You’re looking to the school, and you’re looking to the early care and education program to facilitate the exercise. Kids coming home after school and they’re sitting in front of the TV, or they’re playing with their video games.”
	Afterschool	3. “It [high prevalence of childhood obesity in the community] makes me very sad because—I just notice when I drive around I don’t see kids playing outside like kids used to do a long time ago. Everybody is in the house playing video games, so we got try and change that.”
	School	4. “I think that in some ways, it has to do with the socio-demographics. It’s a lot less expensive to eat poorly than it is to eat well.”
	School	5. “Depending on where you live there may not be a place to go outside and play and depending on their economic status ... you may not have a yard, or you may not be near a park.”
	Early Care and Education	6. “In [community name], we actually only have three grocery stores. For a large city that’s a very small number. But also, it’s those convenience stores that are on the corners and are near the housing. And you know, they’re offering candy and chips and everything else, and where are the fruits and the vegetables and everything else that we preach about? But, they [parents] don’t have the accessibility to find and even purchase some of those items.”
	School	7. “Well the first thing that comes to my mind is a real

		large lack of education, whether it be with the student or with the parents, but the adults in general are not aware of a lot of the things that they should be aware of.”
	School	8. “I’m not sure if there is a lot of organized activities and sports that happen for these children because of so much funding that has been cut. For example, at my own school, we used to be able to run afterschool intramural programs, and afterschool programs and pay the teachers to run these programs, but unfortunately many of those programs have been cut.”
	School	9. “So when we don’t have that sort of ability for transportation or financial support to be able to join the youth league and to be able to ... cart them over to the youth league, the students in this area do not have a lot of external organized activities.”
	Primary Healthcare	10. “But I would say half of the community is Hispanic origin and they attend to eat the rice and the beans and things that are high in carbs, high in fat and not necessarily the healthiest choices, not a whole of vegetables... They [parents] wouldn’t think that they are doing anything wrong. They are just trying to feed their kids.”
	School	11. “I think ... that we have a strong Hispanic culture and there is a very different attitude towards food and weight ... and health.”
	WIC	12. “Not all of our neighborhoods are the safest neighborhoods, so ... I’m sure people aren’t walking as much as they used to.”
Strategies related to childhood obesity prevention and most feasible of these strategies	School	13. “There is a program through the state where the cafeteria, the food service management, is responsible for preparing healthy lunches and make sure that they eat according to My Plate.”
	School	14. “In ... our school wellness initiative we don’t allow parties that have unhealthy food. Like, we can’t bring cupcakes into the building. We can’t do bake sales and things like that. I think we’re ahead of the game when it comes to that initiative to try to promote healthier foods. We don’t use food as a reward for kids. I think we also have water available for kids if they need water.”
	School	15. “The food [school lunch]. Because I mean that’s being done district wide.”
	Afterschool	16. “I think the most [feasible] was the water. Because when we were offering the water to the kids they kind of looked at us like they were crazy like, "You're

		really offering us water?" Which we never did, and we keep cold water in the fridge. They seem like, they lean more towards, the water than the milk."
	Afterschool	17. "Well, we just actually—and our policy is that during school vacations they have to bring their lunch. We just made it a policy: no fast food, no juice. It has to be a healthy lunch. We send information regarding what healthy lunches and what healthy serving sizes are to them [parents].
	School	18. "We're also gonna be doing a Walk Across America, so we're getting some pedometers. The third, fourth and fifth grades when they come in at 8:00am they walk around the gym. We're gonna start tracking how many miles they walk around the gym. We're gonna actually put it up on the bulletin board so that the kids can see how far they've traveled."
	Afterschool	19. "New Bedford Y is we have a youth circuit area within our Wellness Center so we have a line of equipment that's designed specifically for kids. Actually, it's great equipment and it uses the child's body weight so it's such great equipment that even our adults use it."
	Early Care and Education	20. We have access to a gym and so does in MOC [Montachusett Opportunity Council], and taking the kids to the gym to do some real movement out of the classroom is also good, too.
	Afterschool	21. "The activity. The physical activity is very, very easy because you tell kids to put rollerblades on, and they love it... They have to jump around and they love that stuff... Our kids sit in the classroom for eight hours. They are so thrilled to be out and run around in the gym. They just love to run around. Oh, it was easy. It was very, very easy."
	Afterschool	22. "The most feasible is probably the open gym time. Because it's just entirely at our facility so it doesn't require any of our...staff to take extra time, it's already on our hours. It's just at our site so it's probably in terms of funds it's the least expensive."
	Afterschool	23. "We do a monthly newsletter that so that's most of our communication to the parents. We try and always attach healthy, fun recipes."
	Early Care and Education	24. "The family handouts. If you can provide family handouts to parents that's the easiest way to get information [to them]. Or family activities. You know, offering stuff that they can to get, stuff the whole

		family can do.”
Needed and important strategies – organizational level	School	25. “So the kids are always complaining that they don’t get PE [physical education] enough because they only see me once every six days. So, I would say increasing PE.”
	School	26. “They desperately need to add more elementary physical education teachers.”
	School	27. “I definitely feel we should have gym, you know, physical education every day. Every day. I mean it’s ridiculous not to have that. I also think that we should have health classes. We don’t have health classes.”
	Early Care and Education	28. “I really wish physical activity and the health and nutrition was more applicable and also mandated so to speak. And um, maybe mandate is the wrong word. Maybe more utilized in the classroom.”
	School	29. “I do think that increasing phys ed [physical education] time and making sure that, you know, recess is mandatory. I think those would be helpful.”
	School	30. “I think they could do both [including physical activity and nutrition] you know. Bring it right in the curriculum. I haven’t seen that. And that’s too bad, but I think that it could happen. If they really tried, they could bring it in to the curriculum. Then it would be mandatory and the kids ... the whole state of Massachusetts, the department of education could incorporate it... That should come from national, from the President as far as like incorporating something that’s mandatory in the curriculum where the children learn about nutrition.”
	Early Care and Education	31. “Get their school lunches healthier. I like that they can’t send in cupcakes and cookies anymore for school for the snacks and school parties. That makes me happy.”
	Afterschool	32. “I would like to see implemented a little bit better a snack or food and drink policy at our center. I think that we’ll be able to a better snack policy. So maybe only water can be allowed in certain areas and then as far as foods maybe we provide a better snack to them [children]. Unfortunately right now we do not have a snack available for the kids and consequently kids are bringing in outside food and it’s not always the best choices.”
	School	33. “As far as the food goes, I do think that maybe giving them [the children] a few other options. I know that’s

		difficult when you're feeding a mass amount of kids, but I think giving some healthy, additional healthy options, you know the kids maybe haven't been exposed to a lot of this food."
	Early Care and Education	34. "Probably one of the easiest things that can be done is to change their eating habits at school. You know, get the vending machines out of the schools. Um, changing the way the kids view their meals at school."
	School	35. "I can think they could do healthy snack machines, like vending machines."
	School	36. "We definitely could be taking far more aggressive action on getting to the homes through technology. It's amazing, they don't have food but they do have computers."
	Primary Healthcare	37. "But I feel that if you starting incorporating the homes that will work."
	WIC	38. "It is more the information part ... more information, more ideas, what different things they [parents] can do with their kids."
	Afterschool	39. "Something that we could do—I don't know how possible it would be—but would be hosting nutrition/healthy-living classes for the parents."
Needed and important strategies – community level	Early Care and Education	40. "But instead of everybody just doing things separately, and if we're all typically working on the same goals, why don't we all work together? ... Let's share our resources, share our ideas and let's tag team this. Let's really work together and make a bigger team and a bigger trend throughout the community. So really, the collaboration piece is a huge piece."
	School	41. "I think every entity that has a direct public connection needs to incorporate a message to the whole community. It has to be consistent."
	Afterschool	42. "I would say town meetings, community meetings, events. Having flyers around letting them know, give a little bit brief information on it, some pamphlets. The spoken word, having the word out there and especially having a communication with the health centers which is important because a lot of people go there."
	Early Care and Education	43. "I think that probably offering more family oriented outdoor movement to get the kids away from the TV as much as possible."

	School	44. "Helping parents to understand, that ... a cookie isn't a good snack."
	Afterschool	45. "I firmly believe that parent involvement and awareness and education are so important. So beginning that fight, so to speak, in the home is absolutely essential."
	School	46. "I think that we should be promoting our parks. A lot of these neighborhoods do have nice parks that kids can go to and I think we can talk about exercise, or taking a walk or you know doing something fun."

6.3 Publication 3 – Print version:

Lessons Learned in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project: The Perspective of Community Stakeholders, Massachusetts 2013-2014

Citation: The final publication is available at Preventing Chronic Disease via <https://doi.org/10.5888/pcd14.160273>

Ganter C, Aftosmes-Tobio A, Chuang E, Kwass JA, Land T, Davison KK; MA-CORD Study Group. Lessons Learned by Community Stakeholders in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project, 2013-2014. *Prev Chronic Dis*. 2017 Jan 26;14:E08. doi: 10.5888/pcd14.160273. PMID: 28125400

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My contribution to the publication:

Two colleagues (AA, EC), my advisor (KKD), and I developed the semi-structured interview guide. I contacted stakeholders for interview participation. A colleague (AA) and I conducted the interviews over the phone. I organized interview transcription with a company (Landmark Associates Inc.). I reviewed the transcribed interviews for accuracy and entered the transcripts into NVivo QSR 10.0, software for analyzing qualitative data. I developed a preliminary coding framework while reading five different transcripts. A colleague (AA) and I used this framework and coded five randomly chosen interviews to test the framework. Coding was discussed and disagreement resolved between the two coders and my advisor (KKD). I then coded all remaining transcripts. Final coding was discussed in a team. Results were discussed with KKD. I drafted the paper for publication and edited co-author comments.

Parts of this publication were presented at the Experimental Biology conference in Boston, USA 2015.

ORIGINAL RESEARCH

Lessons Learned by Community Stakeholders in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project, 2013–2014

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Suggested citation for this article: Ganter C, Aftosmes-Tobio A, Chuang E, Kwass JA, Land T, Davison KK, et al. Lessons Learned by Community Stakeholders in the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Project, 2013–2014. *Prev Chronic Dis* 2017;14:160273. DOI: <https://doi.org/10.5888/pcd14.160273>.

PEER REVIEWED

Abstract

Introduction

Childhood obesity is a multifaceted disease that requires sustainable, multidimensional approaches that support change at the individual, community, and systems levels. The Massachusetts Childhood Obesity Research Demonstration project addressed this need by using clinical and public health evidence-based methods to prevent childhood obesity. To date, little information is known about successes and lessons learned from implementing such large-scale interventions. To address this gap, we examined perspectives of community stakeholders from various sectors on successes achieved and lessons learned during the implementation process.

Methods

We conducted 39 semistructured interviews with key stakeholders from 6 community sectors in 2 low-income communities from November 2013 through April 2014, during project implementation. Interviews were audio-recorded, transcribed, and analyzed by using the constant comparative method. Data were analyzed by using QSR NVivo 10.

Results

Successes included increased parental involvement in children's health and education, increased connections within participating organizations and within the broader community, changes in organizational policies and environments to better support healthy living, and improvements in health behaviors in children, parents, and stakeholders. Lessons learned included the importance of obtaining administrative and leadership support, involving key stakeholders early in the program planning process, creating buffers that allow for unexpected changes, and establishing opportunities for regular communication within and across sectors.

Conclusion

Study findings indicate that multidisciplinary approaches support health behavior change and provide insight into key issues to consider in developing and implementing such approaches in low-income communities.

Introduction

In the United States, the prevalence of childhood obesity is high: 16.9% of children and adolescents aged 2 to 19 years were obese in 2011–2012 (1). Racial/ethnic and socioeconomic disparities between children of normal weight and obese children also persist (2–4). Obesity is a multifaceted disease, demanding sustainable, multidimensional approaches that support change at the individual, community, and systems levels (5–7). Multidisciplinary approaches are more successful in addressing childhood obesity than are single-site interventions (8,9). A 2016 review showed the promising results of multicomponent community-based interventions designed to prevent childhood obesity (10). In public health research, multidisciplinary interventions play an important role



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and should be emphasized (11–14). Funded by the Centers for Disease Control and Prevention, the Childhood Obesity Research Demonstration (CORD) project addressed this demand by incorporating evidence-based approaches (15). CORD is a multisite program that was implemented from September 2012 through August 2014 in Massachusetts, California, and Texas. Obesity is most prevalent in families with low socioeconomic status (4); therefore, CORD targeted underserved children aged 2 to 12 years (15).

This study focused on the Massachusetts site of CORD (MA-CORD). Evidence-based interventions were implemented in 5 community sectors: health care; early care and education; the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); schools; and after-school programs (16,17). Interventions targeted 5 key behaviors: fruit and vegetable consumption, sugar-sweetened beverage consumption, physical activity, screen time, and sleep duration. These behaviors have strong associations with children’s weight development (17). To date, little information is known about the successes and lessons learned from a stakeholder’s perspective for implementing multidisciplinary interventions. A Cochrane review called for more qualitative research as part of intervention implementation (18). Although researchers can gain valuable insight from stakeholders’ experiences with interventions such as MA-CORD, few studies provide a detailed qualitative account of the implementation process (9,18,19). This qualitative study addressed this gap by outlining successes and lessons learned from the perspective of community stakeholders directly engaged with MA-CORD, including stakeholders from after-school programs, elementary and middle schools, health care, WIC, the parks and recreation department, and coordinators from each community.

Methods

MA-CORD was implemented in 2 communities in Massachusetts (population, 40,545 and 94,958) from September 2012 through August 2014. Poverty rates in both communities are approximately twice as high as the state’s average, with a mean income per capita between \$12,600 and \$14,500 lower than the state average (20,21). Both communities have large non-Hispanic white (~68%) and Hispanic (16%–22%) populations. Interventions were implemented in multiple community sectors (Figure). Details on the intervention components and evaluation design for MA-CORD are available elsewhere (16,17,22).

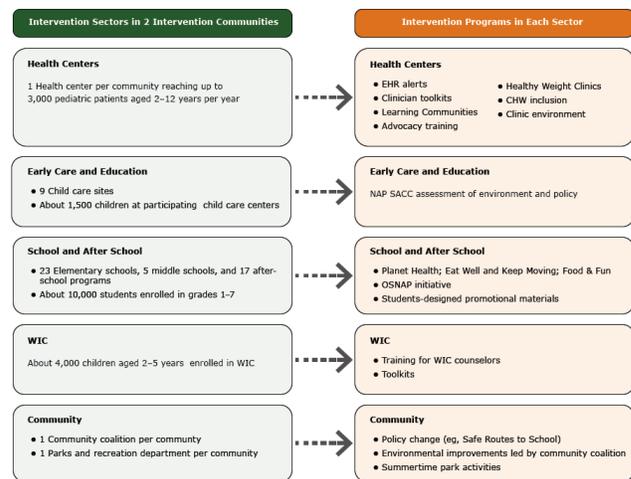


Figure. Summary of intervention sectors and intervention programs (17), study of success stories and lessons learned in Massachusetts Childhood Obesity Research Demonstration project, 2013–2014. Abbreviations: CHW, community health worker; EHR, electronic health record; NAP SACC, Nutrition and Physical Activity Self-Assessment for Child Care; OSNAP, Out-of-School Nutrition and Physical Activity; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

Stakeholders from all sectors who were directly (eg, teachers, pediatricians) or indirectly (eg, school principals, program directors) engaged in implementing MA-CORD were invited by email from October 2013 through April 2014 to participate in an interview. We had no other inclusion or exclusion criteria. Up to 2 follow-up emails were sent; stakeholders who did not reply after the third email were counted as nonresponders. We contacted 183 stakeholders and 40 (22% response rate) completed an interview. The study was approved by the institutional review board at the Harvard T.H. Chan School of Public Health. Stakeholders received a \$20 gift card as compensation.

A semistructured interview guide was developed to support standardization of interview procedure (Box). Two authors (A.A., C.G.) conducted all interviews by telephone from November 2013 through April 2014. One interview was conducted with 2 stakeholders, the previous and current coordinator from 1 community, resulting in 39 interviews with 40 participants. Demographic information was collected at the end of each interview. The average interview length was 34 minutes, with a range of 16 to 87 minutes.

Box. Sample questions from the semistructured interview guide used for qualitative study of MA-CORD (Massachusetts Childhood Obesity Research Demonstration) project

Organizational and individual role in MA-CORD
What are your organization's and your own role in MA-CORD?
What specific things have you done as part of MA-CORD?
Institutional fit
Does MA-CORD fit with your organization's priorities?
Do you feel it is a high, medium, or low priority for your organization?
What gives you that impression?
Were any competing priorities voiced by staff?
Does MA-CORD fit with your current work tasks and job description?
Can you please explain that a little bit?
Do you feel that your role and work in MA-CORD is valued and recognized?
Successes and barriers, time commitment
Thinking back on your experiences with MA-CORD over the past year, what do you think has been working well?
What problems or challenges (if any) have you, or the staff implementing MA-CORD, experienced?
Parent involvement
How, if at all, has parents' awareness of and/or involvement in childhood obesity changed since MA-CORD was launched?
What do you think is necessary to increase parent involvement and awareness of childhood obesity prevention?
Changes over time
Have there been any major changes in your organization since MA-CORD started?
Linkage
Have you noticed any connection between MA-CORD activities within your organization and obesity prevention efforts within the broader community?
To your knowledge, have children who are overweight or obese been referred to other obesity prevention programs in your community (eg, Healthy Weight Clinic, after-school programs)?
As part of MA-CORD, do you interact with other sectors (eg, school system, health clinics, after school, child care, parks and recreation) in the community?
Closing
If you were giving the choice to be a part of MA-CORD again, would you choose to?
If yes: Why?
If no: Why not?
Is there anything I haven't asked about MA-CORD that you think is important for me to know?

Data analysis

Audio files were transcribed and transcripts were reviewed for accuracy by 1 interviewer (C.G.). Final transcripts were entered into

QSR NVivo 10.0 (QSR International Pty Ltd). Data analyses were conducted by using the constant comparative method based in grounded theory. An inductive approach was used (11,23). One coder (C.G.) read 5 randomly selected transcripts representing different sectors to develop a coding framework that reflected successes and lessons learned. This framework was then discussed (A.A., C.G., K.K.D.), and 2 coders (A.A., C.G.) coded 5 additional, randomly chosen interviews. Coding was compared and discrepancies were resolved by the 2 coders (A.A., C.G.). Additional categories were also discussed and added as needed. Remaining transcripts were coded by 1 coder (C.G.). The framework was scrutinized for overlap and subcategory relevance, and a final framework (Table 1) was developed by 3 authors (A.A., C.G., K.K.D.) To attain reliability within the coding process, each decision on changes to the codebook was discussed and documented. Additional coding was conducted if needed. During data collection, an audit trail was used to track interview participants and procedures (24). All 3 coders have a background in public health and experience in qualitative research.

Results

Of the 40 stakeholders, 20 were from schools, 8 from health care, 4 from after-school programs, 3 from WIC, 2 from parks and recreation, and 3 were coordinators from the communities (Table 2). A summary of key successes and lessons learned follows, along with an illustrative quote. Additional quotes are provided in Table 3.

Success stories

Intervention acceptability. Most stakeholders (24 of 39, 62%) supported the program and made it a medium or high priority, and most (27 of 39, 69%) felt that MA-CORD fit into their organization, for example, by delivering similar messages. One stakeholder from WIC said, "I think [MA-CORD] should just be a normal part of everyone's curriculum and messaging."

Increase in parent involvement. About half of stakeholders (20 of 39, 51%) reported an increase in parent involvement. They observed higher participation rates in activities at schools and after-school programs, increased involvement during appointments at health care and WIC offices, and children bringing more healthful lunches to school. Stakeholders pointed to consistent messaging about 5 key behaviors throughout the community, an increase in community-wide strategies, and awareness of childhood obesity as reasons for these changes. A health care stakeholder noted, "The parents are asking questions. They're more engaged when they come in for the visit. . . . Parents are actually coming over to the table asking questions, asking for the brochures — never happened before."

Increased linkages. Two-thirds of stakeholders (26 of 39; 67%) reported improved connections to community resources, such as food services, the Safe Routes to School program, Head Start, and several community parks. Nine (23%) stakeholders said that visible and consistent messaging about MA-CORD and events helped to create linkages between community agencies and foster greater collaboration within organizations. As a WIC stakeholder noted, “We counsel on these same messages, so it’s great that they’re hearing it out in the community, too, whether it be at Head Start, at the park, at different after school programs.”

Opportunities to implement new activities. Most stakeholders (35 of 39; 90%) participating in MA-CORD were able to implement new activities to support increased physical activity and improved nutrition, such as regular walks to school, providing physical activity equipment, adding more healthful choices for breakfast and lunch in schools, offering more fruits and vegetables in schools and after-school programs, and changing menu options in public restaurants. One school stakeholder mentioned, “I’ve always done something with a walking program, but I really focused a lot on that. We have a walking club. I do it every morning early on. A lot of these things have started or have continued because of the program.”

Opportunities to change policies and/or organizational environment. About half of stakeholders (20 of 39; 51%) talked about changes in the policy or food environments, such as eliminating vending and soda machines, providing water instead of soda, and changing the staff handbook to discourage staff consumption of unhealthy snacks in front of the children. A school stakeholder noted the following:

[The school] took the chocolate milk right off the menu. The kids have white milk or water. . . . The girl that I work with, she said . . . ‘The white milk tastes like plastic.’ Then after a while she says, ‘Now that I had the white milk . . . I’m getting used to the taste. I had the chocolate milk and it’s so sweet.’

Stakeholders’ behavior change, buy-in, and perceived responsibilities as role models. Sixteen (41%) stakeholders reported positive changes in staff and child behaviors. In schools, several stakeholders reported that school staff made more healthful choices to model behaviors and that children subsequently changed their eating behaviors. As one teacher said, “I used to bring in a salad every morning. . . . My students actually started doing the same. Instead of eating chips and cupcakes and cookies every day, I’d say probably at least one-third of my kids started bringing in salads in the morning and healthy snacks.”

Nine (23%) stakeholders indicated that awareness about childhood obesity and the 5 key behaviors increased. Stakeholders

mentioned that they are more aware than before that children are watching too much television or eating too much sugar or that parents are sending requests for more information about the MA-CORD program.

All stakeholders said that they would participate in MA-CORD again, because they were aware of the childhood obesity problem and the impact it was having on their communities and because they believed in the program, as stated from a stakeholder from a parks and recreation department.

I think that the concept and the structure of it [MA-CORD] is a really good model for other communities to follow. I feel like policy, system, and environmental change really provides the biggest impact at the community level, versus working with individual-level behavior change. Then . . . in terms of all the sectors, with the consistent messaging, is also best practice that other communities should be looking into. Everyone is on the same page with a common vision.

Lessons learned

Leadership and administrative support. Almost all stakeholders (35 of 39; 90%) reported that the presence of leadership and administrative support for the program reduced feelings of conflict between program implementation and other priorities among staff members. A school stakeholder mentioned, “We have very, very good support . . . with the principals in each building. They’re extremely approachable about anything that we ask. If we say, ‘Hey, you’ve got an assembly coming up. . . . Can one of those have a MA-CORD component?’ They’re like, ‘Okay.’”

Likewise, the challenges resulting from a lack of buy-in from leaders were described by a school stakeholder who experienced challenges with program implementation when administrative support waned: “They do not even mention it [MA-CORD] anymore. . . . Last year it was ‘We want you to do this curriculum,’ and this year it’s not even mentioned by the administration.”

Preparation for unexpected changes. Most stakeholders (22 of 39; 56%) named several unforeseen events during planning and implementing MA-CORD. Turnover caused by retirements, job loss, and resignations was experienced at all levels of staff. A stakeholder from the health care sector said, “The school department, they’re so understaffed right now. . . . Trying to get into the school department to try to spread the message or be involved is tough.”

Also, new staff were hired and became part of the implementation process. Another unpredictable event was inclement weather, which led to cancellations of many trainings in the school and after-school sectors, causing delays in program implementation.

Early involvement of stakeholders to assess existing resources.

Twelve stakeholders mentioned the importance of assessing the processes and tools that organizations have in place before planning and implementing interventions. They mentioned that they already had access to resources (eg, a system to track height and weight in the clinical sector) and informational material on childhood obesity prevention before MA-CORD was implemented, and either did not understand why their systems should change, or did not find the changes helpful. A stakeholder from the healthcare sector noted, “A lot of the things that they’re discussing now, we’ve already learned or done.”

Regular communication. More than half of the stakeholders (23 of 39; 59%) wished for more regular communication and greater clarity about their role in MA-CORD, as described by a school stakeholder:

I’ll be honest with you, I wish I knew more of what was available through MA-CORD. . . . There were a couple of your colleagues here . . . and they were telling me all the things that were available, and I was like, “I didn’t know any of that.” . . . Sometimes communication in the district is a little difficult. I just wish I knew more about what was available to us.

Cross-sector communication was particularly important. Twelve (31%) stakeholders cited the benefits of exchanging information and ideas during cross-sector training sessions, which helped them to explore new ideas and to discuss their experiences with intervention components and events they had planned. Additionally, stakeholders addressed a communication tool, such as an online platform as opportunity to discuss what is and is not working. An afterschool stakeholder said, “The opportunity to share with the other teams and hear what they’re doing, working with the administrators of the program and the specialists to get ideas has been good.”

Account for family life circumstances and other barriers. Although a range of strategies were used to accommodate the various needs of families to improve involvement in MA-CORD, 19 (49%) stakeholders named families’ lack of financial support and transportation challenges as two of the most common reasons for low program attendance. One WIC stakeholder mentioned, “Our participants are coming in with a range of needs including housing, lack of food, other social issues. Sometimes nutrition is not what we talk about.”

Discussion

Overall, we found a high level of stakeholder and community buy-in to MA-CORD with all stakeholders reporting they would implement MA-CORD again. Stakeholders said that the program was a

priority for their organization because it was consistent with their organization’s goals and provided opportunities to implement new and old activities and policies and support existing ones. Other studies show that changing existing policies or using new policies can ensure program sustainability (19). A novel finding of this study is that stakeholders served as positive role models for families and were motivated to change their own behaviors. These successes may be due to the fact that MA-CORD was implemented by community organizations rather than by researchers. This type of experiential learning can be a motivational tool for behavior change when working with community stakeholders.

Half of all stakeholders described increases in parent participation in activities. Parent involvement is necessary for successful implementation of child health interventions (13,25,26). MA-CORD used diverse strategies for approaching and involving parents; these strategies ranged from in-person counseling at WIC and health care visits, school events that included a MA-CORD media competition (27), and materials promoting the 5 target behaviors that were distributed across sectors. Stakeholders also observed that families faced many challenges beyond nutrition; these are described elsewhere (28). In future interventions, parent involvement could be further enhanced through a more holistic approach that moves beyond a focus on children’s diet and physical activity.

Although levels of community and stakeholder buy-in were high in both communities, levels of administrative and leadership support were sometimes low. During these periods, other events, such as an anti-bullying program, were given higher priority. A strong communication strategy directed toward administrators and leaders can help gain their necessary support. Regular staff turnover, particularly in schools, created challenges, because training new staff was logistically problematic. Developing a comprehensive training manual and using a train-the-trainer model may have alleviated some of these challenges. Unforeseen events can be addressed effectively if the project anticipates these possibilities from the beginning. Training sessions were often difficult to reschedule given the number of people involved. In the future, it may be advisable to prepare web-based trainings as alternative. Finally, stakeholders were enthusiastic about cross-sector interactions and communication. However, few of these opportunities were provided in MA-CORD. Future programs would benefit from creating multiple opportunities for cross-sector training and learning collaborations to permit the sharing of resources and lessons learned.

Qualitative studies add to existing epidemiological and behavioral evidence because they may suggest ideas for adapting interventions to community and individual needs (29). This study has several limitations. First, a low response rate could indicate a selection effect in which only the stakeholders most committed to MA-

CORD chose to participate. Another limitation was the use of convenience sampling. Aside from stakeholders' existing involvement with MA-CORD, no other exclusion criteria were defined. As a result, our sample over-represents stakeholders from the school sector. Because we invited all eligible stakeholders to participate, chances were high that a higher portion of school participants would be interested in participating. Finally, because MA-CORD was implemented only in 2 low-income communities in the northeastern United States, findings may not be generalizable to all communities; however, providing a detailed description about the study sample and the 2 intervention communities may still help other researchers to apply our results to their studies (17).

This study contributes to implementation research by identifying important successes and lessons learned in the context of a multisite and multisector program to prevent and control childhood obesity. The insight gained through this process will benefit future interventions by streamlining the implementation processes and anticipating challenges before they occur (18).

Acknowledgments

MA-CORD was funded by the National Center for Chronic Disease Prevention and Health Promotion at the Centers for Disease Control and Prevention (award no. U18DP003370) and by the Pilot Studies Core of the Johns Hopkins Global Obesity Prevention Center, which is funded by the National Institute of Child Health and Human Development (U54HD070725). The authors thank the interview participants, Meghan Perkins, Savannah Lee Vicente, and Katie Giles for connecting us to the communities, Dr Rebecca E. Lee and Neha Khandpur for giving input into qualitative research, the MA-CORD coalition leaders in both communities, and the MA-CORD project team.

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Tables

Table 1. Coding Framework, Including Main Themes, Subthemes, and Definitions for Study on Success Stories and Lessons Learned by Stakeholders (N = 40) in the MA-CORD Project, Massachusetts, 2013–2014

Main theme	Subtheme	Definition
Success stories	Intervention acceptability	Stakeholder’s support of MA-CORD. Includes information about whether MA-CORD was prioritized and about the organizational fit.
	Increase in parent involvement	Increase of parent participation and interest in activities related to childhood obesity (eg, participation in school programs, greater interest at physician appointments). Includes information about parents behavior change since MA-CORD.
	Increased linkages	Increase of collaboration, communication, and connections, either within the community or within the organization.
	Opportunities to implement new activities	Opportunities to implement or maintain new activities (eg, nutrition, physical activity, policies) with the help of MA-CORD.
	Opportunities to change policies, organizational environment, or both	Stakeholders talking about the opportunity to change policies, the organizational environment, or both to prevent and control childhood obesity with help of MA-CORD.
	Stakeholders’ behavior change, buy-in, and perceived responsibilities as role models	Change in stakeholders’ behaviors and how that might have influenced children’s behaviors.
	Stakeholders’ future intention to participate in MA-CORD	The answer to the interview question “If you were given the choice to be part of MA-CORD again, would you chose to?” was coded here.
Lessons learned	Leadership and administrative support	Information given about the importance of support needed to implement MA-CORD (eg, leadership, staff, administration).
	Preparation for unexpected changes	Any information about unforeseen events (eg, staff turnover, new hiring, weather) that were problematic during the implementation process.
	Early involvement of stakeholders to assess existing resources	All information on the importance to involve stakeholders early in the process (eg, for needs assessment).
	Regular communication	When stakeholders talked about lack of communication or the support of a good communication and communication tools (eg, within the MA-CORD team, within the program itself, within the sector).
	Account for family life circumstances and other barriers	Barriers and circumstances families face in preventing childhood obesity.

Abbreviation: MA-CORD, Massachusetts Childhood Obesity Research Demonstration.

Table 2. Demographic Characteristics of Community Stakeholders (N = 40) in Study on Success Stories and Lessons Learned by Stakeholders in the MA-CORD Project, Massachusetts, 2013–2014

Characteristic	All, N = 40	Community 1, n = 19	Community 2, n = 21
Community sector			
School	20	10	10
Health care	8	4	4
After-school programs	4	1	3
Special Supplemental Nutrition Program for Women, Infants, and Children	3	2	1
Community coordinators	3	1	2
Parks and recreation department	2	1	1
Sex			
Female	36	16	20
Male	4	3	1
Age, y			
18–29	2	0	2
30–39	7	5	2
40–49	8	4	4
50–59	17	7	10
≥60	6	3	3
Ethnicity			
Not Hispanic	38	18	20
Hispanic	2	1	1
Race			
White	36	17	19
Asian	1	0	1
African American	1	1	0
Unknown	2	1	1

Abbreviation: MA-CORD, Massachusetts Childhood Obesity Research Demonstration.

Table 3. Main Themes, Subthemes, and Illustrating Quotes in Study on Success Stories and Lessons Learned by Stakeholders (N = 40) in the MA-CORD Project, Massachusetts, 2013–2014

Main Theme/Subtheme	Quote
Success stories	
Intervention acceptability	“Oh, it’s a high priority because it just kind of goes along with what we’re trying to do.” (WIC)
	“It is right up there with my priorities, because if we don’t have healthy kids, we aren’t gonna have kids in school to educate.” (School)
	“Some of the wellness policies for the city are now going back into the school and then into individual schools. I think it’s all tied in well, and right around the same time. MA-CORD, I think, helped to strengthen that message.” (School)
Increase in parent involvement	“I think there’s certainly in our community just a heightened awareness because of all the efforts that have been done to raise awareness around youth obesity. I certainly think because of the work in all the sectors that there’s awareness.” (Community coordinator)
Increased linkages	“Some other successes, our peer leaders are . . . going to the Healthy Weight Clinic. They’re gonna start going there once a month to help just do activities for kids and promote the five healthy behaviors for the kids going to the Healthy Weight Clinic.” (Parks and recreation)
Opportunities to implement new activities	“A couple of the things that we were working on was limiting screen time, serving 100 percent water outside of snack ‘cause we serve milk with snack, and to ensure that all children get vigorous physical activity at least 15 minutes a day.” (After-school program)
Opportunities to change policies, organizational environment, or both	“There’s been a lot of policy changes, I guess you could say, in looking very closely at improving activity opportunities and nutritional value and nutritional – what can be eaten in school and what shouldn’t be.” (School)
	“I mean, we have no more vending machines. We have water easily accessible to everybody in the health center, including patients, staff.” (Health care)
Stakeholders’ behavior change, buy-in, and perceived responsibilities as role models	“We mirror what we’re trying to teach them. I’m trying very hard to work on the workplace wellness to emulate all of those messages for kids so that it is a constant stream of information and they’re not getting mixed messages.” (Health care)
	“Because I think I have to model it. If I don’t value it, no one else is gonna value it. People look to the leadership to see what’s of a value to them. If they look at the leadership and realize it is not of value to the leadership, they won’t get behind it.” (School)
	“When I first changed the policies for the staff handbook, there was no negative feedback. They completely understood, and they understood that they have to be the positive role models.” (After-school program)
	“We can’t just preach it to the kids, we have to model it.” (After-school program)
Stakeholders’ future intention to participate in MA-CORD	“Cause I think it’s so important. I think that we need to focus on these things. WIC is a perfect partner to help with that because of the number of kids that we see, the number of families that we interact with and have a positive effect on them. Absolutely, I would hate to see us not participate.” (WIC)
	“I think that the concept and the structure of it is a really good model for other communities to follow. I feel like policy system and environmental change really provide the biggest impact at the community level, versus working with individual-level behavior change. Then, I feel like the model, in terms of all the sectors, with the consistent messaging, is also [a] best practice that other communities should be looking into. Everyone is on the same page with a common vision.” (Parks and recreation)
	“I would. I think it’s a good program.” (School)
Lessons learned	
Leadership and administrative support	“It matters to the superintendent. It matters to the mayor. It matters obviously to the school committee as well, but it matters to our PTO [parent–teacher organization], because the PTO has said to me that it’s not as vibrant at other schools because they feel that the principal is not pushing it as much as I am.” (School)
	“My director and manager are super supportive and continuously praising us.” (Health care)
Preparation for unexpected changes	“Because of the budget cuts and people’s positions being lost, there was a lot of movement this month. We have some folks that are teaching fourth and fifth grade this year, who were not teaching at that grade level last year, so we have new people to train.” (Community coordinator)
	“We’ve had to do more with less staff due to budget cuts.” (WIC)

Abbreviations: MA-CORD, Massachusetts Childhood Obesity Research Demonstration; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

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Table 3. Main Themes, Subthemes, and Illustrating Quotes in Study on Success Stories and Lessons Learned by Stakeholders (N = 40) in the MA-CORD Project, Massachusetts, 2013–2014

Main Theme/Subtheme	Quote
	“Then we also have some brand new staff that are really new to [MA-CORD]. They don't know the bigger picture . . . and that's a little more time-consuming getting them up to speed.” (School)
Early involvement of stakeholders to assess existing resources	“I have one school that was like, 'Oh my! This is perfect! We needed it so much! Then I have another school . . . [the physical activity equipment] sat in boxes in the nurse's office for three months.” (School) “Some of the things that were being discussed on the conference call, as a team, we had already established here or we already had those types of things in place here.” (Health care)
Regular communication	“I like listening to different ideas as other schools have done things, so if they have a forum or a blog that we could share information. I think that would be really helpful, because . . . if other schools that have the same kind of demographics that we have, if they've tried something that works, and vice versa, it would be great to hear, so we're not trying to reinvent the wheel. It would take less time and energy to get something in place if they, if some school's already done it.” (School) “And again it's an opportunity to share information and share ideas and help each other. That's been really helpful.” (After-school program)
Account for family life circumstances and other barriers	“Like I was telling you earlier, our participants are coming in with a range of needs, including housing, lack of food, other social issues. Sometimes nutrition is not what we talk about.” (WIC)

Abbreviations: MA-CORD, Massachusetts Childhood Obesity Research Demonstration; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.