# A Comprehensive Process Evaluation of the Solmaz Institute: A Non-Clinical Childhood Obesity Program in Hickory, NC

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## Abstract

**Background:** Childhood obesity is a major public health concern in the U.S., affecting nearly 20% of children, with projections suggesting over half may be impacted by 2050. This complex condition results from behavioral, environmental, genetic, and socioeconomic factors, leading to serious physical and mental health risks. Diagnosis typically involves Body Mass Index (BMI) and other health indicators. Key risk factors include poor diet, inactivity, food insecurity, mental health issues, and genetics. Treatment includes both clinical approaches in outpatient settings and non-clinical, community-based interventions focused on prevention and lifestyle change. This paper evaluates the Solmaz Institute, a free, non-clinical program at Lenoir-Rhyne University that provides nutrition counseling and fitness coaching to children with obesity. **Methodology:** Through chart reviews, interviews, and statistical analysis, this evaluation examined program adherence to best practices and the relationships between various indicators of client engagement. **Results:** Linear regression showed no significant relationship between response times and either office staff presence ($R = -0.01$, $p = 0.88$) or initial parent meeting attendance ($R = -0.06$, $p = 0.43$). However, strong, significant correlations were found between parent meeting attendance and RD meeting attendance ($R = 0.91$, $p = 0.00$), and between RD and fitness session attendance ($R = 0.83$, $p = 0.00$), accounting for 82% and 68% of the variance, respectively. No correlation was found between the number of fitness interns and fitness session attendance ($R = 0.04$, $p = 0.64$). **Conclusion:** The findings indicate that while the Solmaz Institute largely aligns with evidence-based guidelines, there are opportunities for improved coordination and client follow-through. With continued enhancement, the Institute is well-positioned to support long-term health outcomes for children affected by obesity in Catawba County.


## Introduction

Childhood obesity is a growing epidemic and continuing public health issue in the United States, affecting approximately 1 in 5 children and adolescents in the United States (Centers for Disease Control (CDC, 2024)). Obesity is a condition that is strongly associated with many chronic health issues. These include type 2 diabetes, cardiovascular diseases, and mental health disorders (Kirk et al., 2022). It is critical that children diagnosed with obesity are treated properly and have access to interventions. Access to proper interventions can play a role in long-term health and well-being (Sanyaolu et al, 2019).

Childhood obesity often persists into adulthood exacerbating health disparities and increasing lifetime medical costs (CDC, 2022). Although early interventions are critical, many practitioners struggle with effective strategies for treating children with obesity. There is no one clear treatment strategy which proves to be difficult when designing interventions (Cuda & Censani, 2019). The multifaceted etiology of childhood obesity emphasizes the need for interventions that address not only individual behaviors but also familial, community, and systemic factors. Programs that recognize this have been shown to improve short-term health outcomes and hold promise for cost-effectiveness when compared with standard care (Kirk et al., 2022).

The Solmaz Institute is a community-based childhood obesity intervention center located in Hickory, North Carolina. This intervention center is uniquely positioned to address the complex issue of childhood obesity through its comprehensive approach of nutrition education, fitness coaching, and behavioral intervention. The Solmaz Institute seeks to deliver accessible, evidence-based care tailored to the unique needs of children and families in the community.

## Background

### *Childhood Obesity*

Childhood obesity is an escalating public health concern with its prevalence increasing steadily. In a study conducted in 2017-2018 the prevalence of childhood obesity was 19.3% with 14.4 million children and adolescents being affected (Kirk et al., 2022). Only three years after this study, in 2020 the prevalence of childhood obesity rose to 19.7% and is approximated at 20% now in 2024 (CDC, 2024). The epidemic of childhood obesity is continuously expanding and by 2050 approximately 57.3% of children in the United States are projected to be diagnosed with obesity (CDC, 2024). Childhood obesity is a complex disease. There are many different factors that play into the development of childhood obesity including behaviors, nutrition, lifestyle, environment, socioeconomic, and psychological factors (Kirk et al., 2022).

*Diagnosis*

Childhood obesity is diagnosed through suitable measurements of Body Mass Index and other factors. Body Mass Index (BMI) is used to calculate the cutoff ranges for diagnosing childhood obesity (Appendix A). BMI is compared with age and sex specific growth charts from the CDC (Appendix A). These are used to determine if a child is in the appropriate ranges in BMI. Severe obesity is determined to be ≥120% of the 95th percentile of the CDC's growth charts (Sanyaolu et al., 2019). When diagnosing childhood obesity BMI should be considered as well as other factors associated with the disease. Other factors that should be considered are eating and physical activity patterns, growth patterns, sleep, stress levels, and family history (Mayo Clinic, 2025).

*Causes and Risk Factors*

Childhood obesity is mainly caused by a combination of two things but can be enhanced by other factors. The combination of excessive caloric intake in combination with a sedentary lifestyle profoundly impacts the development of childhood obesity. Other factors that can

influence the development of childhood obesity are genetic factors, increased stress levels, unhealthy sleep patterns, and certain social factors (Mayo Clinic, 2025). Although a handful of things can cause childhood obesity, there are certain factors that can exacerbate the disease and its development. Some risk factors may not be easily controlled, while others can.

### Eating habits

Childhood obesity can be significantly influenced by dietary habits, particularly the consumption of foods high in added sugars, saturated fats, and sodium. These foods, such as fast foods, baked goods, and snacks from vending machines, are widely available and often designed to be appealing to children's taste preferences. Similarly, sugary treats like candy, desserts, sodas, fruit juices, and sports drinks contribute to weight gain when consumed frequently. Eating or drinking too quickly, not paying attention to each bite or sip, and not adhering to recommended serving sizes as indicated on product labels lead to excessive intake in one sitting (Mayo Clinic, 2025). Screen time is also often associated with excessive intake at mealtimes. This alters the child's ability to focus on the meal. The distraction of screens during meals leads to overconsumption (Tabares-Tabares et al., 2022).

### Physical Inactivity

A lack of daily physical activity is a significant risk factor for childhood obesity, as children who do not engage in regular movement are more likely to gain excess weight. At least 60 minutes of physical activity per day for children and teens is crucial for maintaining a healthy weight. Excessive sedentary behaviors, such as watching TV, playing video games, or spending extended periods on social media, contribute to weight gain (Mayo Clinic, 2025).

### Food Access

Limited access to healthy food contributes to childhood obesity. This is often linked to low socioeconomic status. Families in lower socioeconomic brackets are more likely to live in food deserts. These areas lack affordable and nutritious options like fresh produce and whole grains, while being surrounded by convenience stores and fast-food options. Economic constraints push families toward cheaper, more calorie dense, and nutrient-poor foods. This includes things like freezer meals, crackers, and cookies (Mayo Clinic, 2025).

Mental Health

Personal and family stress can also play a pivotal role in increasing the risk of childhood obesity. Chronic stress can lead to elevated levels of hormones like cortisol, which can stimulate heightened feelings of hunger and cravings for high fat and sugary foods. These physiological responses to stress often result in overeating or choosing calorie-dense comfort foods, contributing to weight gain over time (Mayo Clinic, 2025).

Genetic Factors

Genetic and hormonal factors significantly contribute to the risk of childhood obesity by influencing eating habits and weight regulation. Children with a family history of obesity may inherit genes that predispose them to gain weight more easily. These genetic factors can affect appetite regulation, metabolism, and how the body stores fat. While genetics and hormones are not modifiable risk factors, understanding their role is critical (Mayo Clinic, 2025).

*Complications*

Childhood obesity creates significant risks to physical, social, and psychological health (Sanyaolu et al., 2019). Consuming high-calorie diets rich in added sugars, saturated fats, and processed foods increases the likelihood of developing obesity and its associated complications. Poor eating habits can contribute to type 2 diabetes, as excess weight and poor diet disrupt the

body's ability to regulate blood sugar properly. Additionally, diets high in unhealthy fats and sodium can lead to high cholesterol and high blood pressure. These conditions increase the risk of cardiovascular issues such as heart attacks or strokes later in life (Mayo Clinic, 2025). Excess weight caused by overeating also places added stress on joints, leading to pain or injuries in areas like the hips, knees, and back. Conditions like metabolic dysfunction-associated steatotic liver disease can also occur because of poor dietary habits due to fatty deposits building up on the liver. Breathing issues such as asthma and obstructive sleep apnea are also more common in children with obesity (Mayo Clinic, 2025).

In addition to physical health risks, unhealthy eating habits contributing to obesity can affect social and mental well-being. Children with obesity may face bullying or teasing, leading to reduced self-esteem, depression, anxiety, and even disordered eating behaviors. These challenges underscore the importance of fostering healthy eating habits to support overall physical, emotional, and social health in children.

*Current Treatments*

Childhood obesity is a pervasive public health challenge, with increasing prevalence leading to significant health and social consequences. In addressing this complex issue, a variety of intervention strategies have been researched and implemented. The Academy of Nutrition and Dietetics emphasizes that children and adolescents with overweight or obesity should receive culturally appropriate, multi-component interventions, including family involvement and nutrition counseling from a registered dietitian nutritionist. Treatment programs should include a combination of nutrition counseling, behavioral interventions, physical, activity and mental health interventions (Kirk et al., 2022). Evidence suggests that a combination of these interventions should be successful, but there are often barriers that can alter effectiveness of

specific interventions. In addition to lifestyle modifications there are other ways to treat childhood obesity. These include therapeutic approaches, pharmacological methods, and bariatric surgery (Obesity Action Coalition, 2023). Treatments are based on evidence-based research but are tailored to each specific case of childhood obesity. Treatment strategies are based on a variety of factors including severity of disease, scope of the problem, socioeconomic factors, and availability of resources. These factors can determine where a client seeks treatment whether that be in a clinical setting or non-clinical community-based setting.

### Clinical

Clinical treatment of childhood obesity is typically a tertiary level of treatment. This type of treatment is affiliated with an outpatient facility such as a hospital or doctor's office. These facilities are often staffed with many disciplines of medical professionals including registered dieticians and registered nurses. Clinical care is a more medically modeled form of treatment and often involves strategies such as lab work, clinical evaluations, prescription medications, and more.

### Non-Clinical, Community-based

Non-clinical care for childhood obesity is typically less medically minded and tries to prevent the progression of the disease rather than treat symptoms. This type of treatment is usually a version of primary or secondary intervention. Non-clinical treatment is more of a community-based treatment style and occurs in settings like schools and health departments. This type of treatment can involve health educators and other paraprofessionals who oversee intervention strategies. Non-clinical treatment involves less prescriptive methods and focuses on prevention and lifestyle modification.

The Solmaz Institutes is located on the campus of Lenoir-Rhyne University in Hickory, North Carolina. The Solmaz Institute is funded through an endowment and is free for youth in the region. The Solmaz Institute aims to address child and adolescent obesity by providing nutrition education, counseling and fitness coaching to children and adolescents who are overweight or obese. The Solmaz Institute not only aims to address the immediate health needs of children with obesity but also seeks to instill lifelong habits that promote overall well-being.

Clients are referred to the Solmaz Institute by primary care physicians. The registered dietician and staff will assess the client and start the intake process. During this time the staff work with the clients and their caregivers on dietary habits and physical activity. Throughout this process there are reports and feedback given to the parents regarding their child's progress.

*Research Questions*

Based on the information about childhood obesity and the evidence-based treatments for childhood obesity the following about the Solmaz Institute will be addressed:

1. Is there a relationship between response times and presence of office support staff?
2. Is there a relationship between response times and attendance at the initial parent meeting?
3. Is there a relationship between attendance of the initial parent meeting and attendance at the RD meeting?
4. Is there a relationship between attendance of the RD meeting and attendance at the initial exercise meeting?
5. Is there a relationship between the total sessions attended at the Solmaz Institute and the number of exercise interns available?

6. To what extent does the Solmaz Institute follow the best practice guidelines for the treatment of childhood obesity?

## Methodology

### *Participants*

Participants for this evaluation were the director of Solmaz Institute and clients over the past 4 years.

### *Procedures*

A review of the policies, procedures and documents utilized by the Solmaz Institute was conducted. A retrospective chart review of clients' charts from the past 4 years yielded data to conduct statistical analysis. An informational interview with the director of the Solmaz Institute was conducted to collect qualitative data and information about their current process. Permission was granted by the Solmaz director to conduct these procedures and all data and information collected from the Solmaz Institute remained anonymous through careful collection and secure data storage.

### *Analysis*

An informational interview was conducted and documented as a part of the qualitative analysis. Microsoft Excel was used to conduct linear regressions to address the research questions. Alpha levels were set at 0.05.

## Results

Statistical analyses concluded that there is no relationship between response times and presence of office staff nor between response times and attendance at the initial parent meeting ($R= -0.01$, $p=0.88$) ($R=-0.06$, $p=0.43$), respectively.

Linear regression analyses concluded that there is a significant relationship between attendance at the initial parent meeting and attendance at the RD and between attendance at the RD meeting and attendance at the initial fitness meeting (R= 0.91, p=0.00) (R=0.83, p=0.00), respectively. Of the variance in attendance at the RD meeting 82% could be accounted for due to attendance at the let's get started meeting and 68% of the variance in the initial fitness meeting could be accounted for by attending the RD meeting.

Linear regression analysis revealed that there was no correlation (R=0.04, p=0.64) between the number of fitness sessions attended and the number of fitness interns available and 0% of the variance in fitness sessions attended could be accounted for due to the number of fitness interns available.

Qualitative analysis of the interview and documents examined resulted in a determination that the Solmaz Institute does follow the best practice guidelines in most aspects but not all aspects of their process.

## Discussion

This process evaluation aimed to assess the operational effectiveness of the Solmaz Institute and its alignment with best practice guidelines for childhood obesity treatment. Through statistical analysis of data from the last four years and an informational interview with the director, several important findings emerged.

One of the most surprising findings was the lack of a significant relationship between office support staff on response times. Response times refers to the time between referral from the physician to first contact with the Solmaz Institute and this was measured in days. Despite the assumption that support staff would expedite communication and scheduling, the data

showed no relationship between response times and presence of office support staff. Interestingly, the average response time was about 13 days when support staff were not present, compared to 17 days when they were. These findings suggest that the presence of office support staff does not directly influence the response time of the Solmaz Institute. Several potential explanations may account for this finding. Research on healthcare workflows suggests that simply adding staff does not necessarily improve efficiency unless responsibilities are clearly defined and systems are optimized (O'Malley et al., 2010). When support staff are present, responsibilities may be more distributed, leading to reliance on internal communication handoffs that can unintentionally delay follow-up. In the absence of support staff, clinical or administrative team members may assume a more direct, streamlined approach to contacting families, which could speed up the process. Furthermore, inconsistent delegation or lack of standardized referral protocols may result in varied performance among different staff members, ultimately diminishing the intended impact of additional personnel (Liddy et al., 2013). Additionally, the presence of support staff may not affect response time if referral follow-up is not a prioritized task within the support staff role. Without clear expectations or performance tracking, administrative time may be divided across competing priorities. Research has shown that task-specific training and workflow standardization are more effective in improving care coordination and administrative outcomes than simply increasing staffing (Chen et al., 2016). These findings suggest that improvements in response times may require changes to referral systems within the Solmaz Institute in addition to consistent staffing.

There was also no significant relationship between response time and attendance at the initial parent meeting. This suggests that response times alone did not impact attendance at the initial parent meeting. There has been research on scheduling lag time in pediatric ophthalmology clinics. This study indicated that shorter scheduling lag times are associated with

higher appointment completion rates (Davis & Lee, 2022). However, this relationship may not directly translate to the context of initial parent meetings in educational settings where different factors influence attendance. This suggests that while timely communication is important, the specific timing between referral and initial contact may not be the primary determinant of attendance at initial parent meetings. Other factors, such as the quality of communication, cultural considerations, and logistical support, may have a more substantial impact (Davis & Lee, 2022).

When examining the relationship between attendance at the initial parent meeting and subsequent attendance at the registered dietitian meeting the data revealed a statistically significant relationship. This trend continued between RD meeting attendance and participation in the initial exercise meeting. These findings indicate a strong positive relationship between early engagement and continued program participation. The relationship between meetings suggests that once families begin attending sessions, they are more likely to remain involved. This pattern is consistent with findings from behavioral intervention literature, which show that early exposure and initial engagement are strong predictors of sustained participation in health promotion programs (Doshi et al., 2016). Programs that foster a positive first experience tend to build trust, lower barriers to participation, and promote a sense of commitment to the intervention (Gourlay et al., 2014). Furthermore, early engagement may serve as a positive influence on behaviors. Families establish routines and feel more connected to program staff and other participants. This concept is supported by social cognitive theory, which emphasizes the importance of observational learning and reciprocal determinism (Bandura, 1986). This means that once families observe the value of sessions and experience supportive environments, they are more likely to continue (Bandura, 1986).

It is important to recognize that initial participation plays a crucial role in sustained enrollment in health promotion programs. Although response times may not have a significant direct impact on long-term engagement, early attendance can serve as a strong predictor of continued involvement. Evidence from school-based, family-involved interventions highlights that strategies such as personalized invitations, follow-up reminder calls or texts, and providing materials in multiple languages can effectively enhance initial participation and foster greater retention over time (Lambrinou et al., 2020).

Interestingly, there was no significant relationship between the total number of sessions attended and the number of exercise interns ($R=0.04$, $p=0.64$). This result suggests that the number of interns may not be the only determinant of ongoing client participation. Other factors, such as intern engagement styles, client motivation, or perceived helpfulness of sessions may play a greater role in the number of sessions a client attends. This aligns with findings from health behavior research that highlight the importance of the client-provider relationship in shaping motivation and adherence to health interventions. One study emphasized the significance of relational factors in motivational interviewing, noting that empathy, support, and personal connection were more strongly associated with behavior change than the number of sessions alone (Resnicow et al.,2002). Similarly, research in exercise adherence has shown that clients are more likely to remain engaged when they feel personally supported, understood, and encouraged by program staff (Estabrooks et al., 2004). Based on previous research along with the research conducted at the Solmaz Institute, the value of quality over quantity when it comes to exercise intern staffing is clear.

In assessing adherence to best practice guidelines, the Solmaz Institute demonstrates a strong commitment to them. It is achieved through its integration of nationally recognized pediatric nutrition and physical activity guidelines. According to the program director, the

Institute follows guidance from the Academy of Nutrition and Dietetics and pediatric-specific guidelines for intervention. This focuses on strategies such as reducing sugar-sweetened beverages, promoting appropriate portion sizes, limiting screen time, and encouraging daily physical activity as outlined by the American Academy of Pediatrics (Kirk et al., 2022). In addition, the program incorporates the Ellyn Satter Division of Responsibility model, which is widely accepted in pediatric nutrition for fostering healthy self-regulated eating behaviors in children (Satter. 2025). Findings from the interview conducted with the director indicate a practical and evolving approach to aligning service delivery with client needs. The adoption of text messaging in 2023 is one such adaptation based on client responsiveness. A similar adoption was made by the provider for pediatric tonsillectomy patients. A study was done and showed overall patient and parent satisfaction were shown with the text messaging system implemented (Newton, & Sulman, 2018). Texting allows staff to clearly explain the program and address barriers to engagement, such as unrecognized phone numbers or lack of voicemail. This shift demonstrates the Institute's responsiveness to community behavior patterns and a willingness to adopt operational practices in line with effective, evidence-informed engagement strategies. The director also emphasized a commitment to practicing within professional scope and staying updated on current research through continued membership in professional groups like Pediatric Nutrition Practice Group. Despite these steps challenges remain including the lack of formal mental health services. The current supervision structure does not allow for the inclusion of qualified counseling interns; therefore, the Solmaz Institute cannot host these services. Despite these limitations, the director's emphasis on adherence to established guidelines helps ensure that interventions remain credible, and client centered. The program's design blends individualized nutrition education, age-appropriate physical activity opportunities, and an emphasis on

relational engagement through student mentors. This illustrates an effort to uphold best practices within the constraints of a university-based, non-clinical setting.

*Recommendations*

Based on the findings of this process evaluation, several recommendations can be made to improve the Solmaz Institute's program effectiveness and improve alignment with best practices.

First, the lack of a significant relationship between office support staff and referral response times suggests that improving efficiency may depend less on staffing quantity and more on optimizing systems and processes. Unfortunately, the Solmaz Institute has limited control over staffing, as it is only permitted to employ graduate assistants as support staff. Graduate assistants are not always available. The University only has a limited number of graduate student opportunities for each program and the positions require a rigorous application process. This limits the number of available, qualified, and interested students to only a few, making it difficult for the Solmaz to have a consistently filled position. In order to recruit more interest from qualified candidates the Solmaz Institute should better market themselves. This could be through an addition to their website or the creation of social media posts specifically recruiting students seeking meaningful, applied experiences in health-related fields. Additionally, conversations with the university could be had to suggest a work-study program that allows undergraduate students to work as office support staff within the Solmaz. Alongside these efforts, internal improvements such as implementing digital referral tracking tools, defining specific workflows for handling referrals, and clarifying task delegation could significantly enhance organizational efficiency and consistency. These strategies not only streamline communication between staff and referral partners but also reduce variability in how new clients are processed. By creating

standardized operating procedures and implementing digital systems for documentation the Solmaz Institute can mitigate the disruptions caused by staff turnover. For example, if a graduate assistant leaves, clearly documented workflows and digital records would allow a new assistant to transition smoothly into the role without a steep learning curve. This type of systems-based thinking aligns with best practices in quality improvement, which emphasize the importance of process standardization and institutional memory to support continuity of care and service delivery (Dixon-Woods et al., 2014). Together, these strategies would help address both the structural and procedural factors influencing response times and support more timely engagement with the Solmaz Institute.

Given the strong relationship between attendance at early sessions and continued engagement paired with the insignificant relationship between response times and initial attendance, the Solmaz Institute should consider implementing new strategies to increase attendance at the initial parent meeting. This includes things like consistent personalized reminders, like the program done with pediatric tonsillectomy patients (Newton, & Sulman, 2018). Additionally, the Solmaz Institute must consider other factors such as family availability, transportation, scheduling, and overall interest in the program that also play a role in attendance. Other research has displayed the prominence of additional factors. One study found that providing school bus transportation can decrease the likelihood of chronic absenteeism, particularly among low-income students. Inconsistent availability of personal transportation was also identified as a barrier to regular school attendance (Edwards, 2023). Additionally, scheduling conflicts due to inflexible work hours have been highlighted as significant obstacles to parental involvement in school activities in similar studies. Moreover, when school programs do not align with families' interests or are perceived as irrelevant, motivation to participate can be low (IES, 2025). Similar challenges are also faced by families in Catawba County and

contribute to attendance patterns, including patterns faced by the Solmaz Institute. To address these factors the Solmaz Institue should investigate strategies to reduce these barriers. One option could be to establish a system where the Solmaz Institute can craft a shuttle schedule that works around scheduling conflicts of parents. This option will not only eliminate some conflicts but also allow for relationship building between clients. This system would be more useful in group workout sessions and would need to be approved with a confidentiality and informed consent system created. Language barriers are also something that must be addressed. Upon data collection it was observed that many clients never attended, and their chart showed the need for interpretation services. This is a real barrier and must be addressed to ensure the Solmaz Institute is able to reach every population that needs their services. Attempting to collaborate with the university to bridge this gap in services is recommended by utilizing Spanish-speaking students who are currently enrolled in advanced foreign language and need credit hours or looking for work-study opportunities.

While the quantity of staff present may not directly affect attendance, the quality of interaction can play a critical role in enhancing the effectiveness of the program. Quality interactions should be rooted in empathy, motivation, and client-centered support. These meaningful interactions not only support client success but also enrich the student intern experience by providing opportunities for advanced skill development and practical application of education. For example, a study found that a brief training program focused on patient-centered communication and empathy significantly improved medical residents' empathy scores and reduced non-verbal distractions during patient interactions (van Dijk et al.,2019). This demonstrates the effectiveness of structured and evidence-based training in improving the quality of provider engagement. However, intern training at the Solmaz Institute is not routinely reviewed or updated unless specific challenges arise, which may limit the integration of the latest

research and best practices into the program. Incorporating regular updates to intern training and emphasizing evidence-based, client-focused engagement strategies could improve both client outcomes and intern learning.

Lastly, while most best practice guidelines are followed, the Institute could enhance its program by formally integrating informal mental health tips, offering translation services, and continuing to ensure that the nutritional education is culturally relevant. Additionally, to improve, the Solmaz Institute should make sure interns are engaged and enthusiastic about working with the population served. Effectively engaging student interns who work directly with clients is both essential and, at times, challenging. To foster meaningful involvement, it is important to educate interns not just on what tasks they are performing, but why these tasks matter. Providing context about the program's goals and the potential impact on clients' lives can help interns develop a stronger sense of purpose and responsibility. When interns understand the value of their contributions, they are more likely to take initiative, build relationships, and deliver higher-quality sessions. Equally important is empowering interns by highlighting the personal and professional growth they can gain from the experience. Structured orientation, consistent communication, continued training, and ongoing mentorship can further reinforce their learning and deepen their investment in the program (Schneider et al., 2024). Collecting regular feedback from clients and families would also be important going forward to inform continuous quality improvement efforts. This feedback can identify perceived weaknesses and challenges to help the Solmaz Institute further strengthen its approach to childhood obesity prevention and management.

*PH implications*

The findings from this evaluation highlight several important public health implications related to childhood obesity prevention in non-clinical, community-based settings. The Solmaz Institute's demonstrates how multidisciplinary, university-affiliated programs can address pediatric obesity through a combination of individualized nutrition education, physical activity promotion, and relationship-centered approaches. Importantly, the program provides services at no cost, which helps reduce economic barriers to care for families in the surrounding area. One significant public health strength of the program is its emphasis on evidence-based nutrition and physical activity guidelines. By aligning with recommendations from the Academy of Nutrition and Dietetics and the American Academy of Pediatrics, the program ensures that its interventions are grounded in scientifically supported strategies. The inclusion of the Ellyn Satter Division of Responsibility model further promotes sustainable and developmentally appropriate eating behaviors. These practices help address modifiable risk factors that contribute to childhood obesity and its associated health outcomes.

The evaluation also reveals critical areas for improvement with broader public health implications. The absence of a consistent mechanism for program evaluation and data-driven decision-making represents a missed opportunity to track health outcomes and demonstrate long-term effectiveness. The lack of formal mental health support, despite the known psychosocial burden of obesity, highlights a gap in holistic care that could be addressed through expanded supervision capacity.

Moreover, cultural and linguistic accessibility remains a notable challenge. Many families face language or literacy barriers and the absence of proactive strategies, such as interpretation services, to deliver culturally tailored content may limit the program’s impact. Public health programs must prioritize cultural competence and health literacy to ensure equity and inclusivity in service delivery.

The sustainability of programs like The Solmaz Institute is uncertain and highly dependent on university support and the availability of student interns. This highlights a broader systemic issue in public health programming. There is a need for stable infrastructure, consistent staffing, and long-term funding models to ensure continued service delivery and capacity for growth.

*Limitations*

Despite its strengths, this process evaluation had limitations. Data was collected retrospectively and depended on accurate chart documentation. It was a struggle to verify if information was documented properly. Since the program relies heavily on interns, there was variability in documentation habits. There was a noticeable discrepancy within the In-Body scan results. The height must be entered upon each scan, but this was often overlooked and resulted in variable BMI and visceral fat measures. These discrepancies demonstrate a lack of reliable information.

Additionally, although this study was retrospective it was only able to examine the past 3 years, due to the recent changes to the Solmaz Institute and the pandemic. The Solmaz Institute recently lost its ability to host dietetic interns, which is something that they had done in the past. If used, the data would have drastically impacted the number and quality of interns in the past when compared with more recent intern availability. Additionally, the pandemic altered the process of the Solmaz Institute when it hit in 2020. Including this data would not have given a clear understanding of the process of the Solmaz Institute, because they were not running under normal circumstances during that time.

Only one staff interview was conducted, limiting the number of qualitative insights. Future evaluations could include more comprehensive qualitative input, including families and more staff, to capture a wider range of perspectives.

The Solmaz Institue's office support staff are categorized as graduate assistants for the purposes of this research. Although the graduate assistants are the main ones responsible for administrative tasks, there are more people who also occasionally share the responsibility. This could include exercise interns, the director, and additional volunteers. This is not something that can be collected since this occurs without documentation. The supplementary actions and responsibilities may have an effect on the outcome of the statistical analysis. Although office support staff do play a role, they are not the only party responsible for response times, therefore results could be skewed.

*Conclusions*

In conclusion, this process evaluation identified several operational strengths at the Solmaz Institute, as well as areas where improvements can be made to increase efficiency, client engagement, and retention. With ongoing refinement, the Institute has strong potential to continue delivering impactful, evidence-based services to address the growing problem of childhood obesity in Catawba county.

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## Appendix A

BMI growth charts for child and adolescents from the CDC

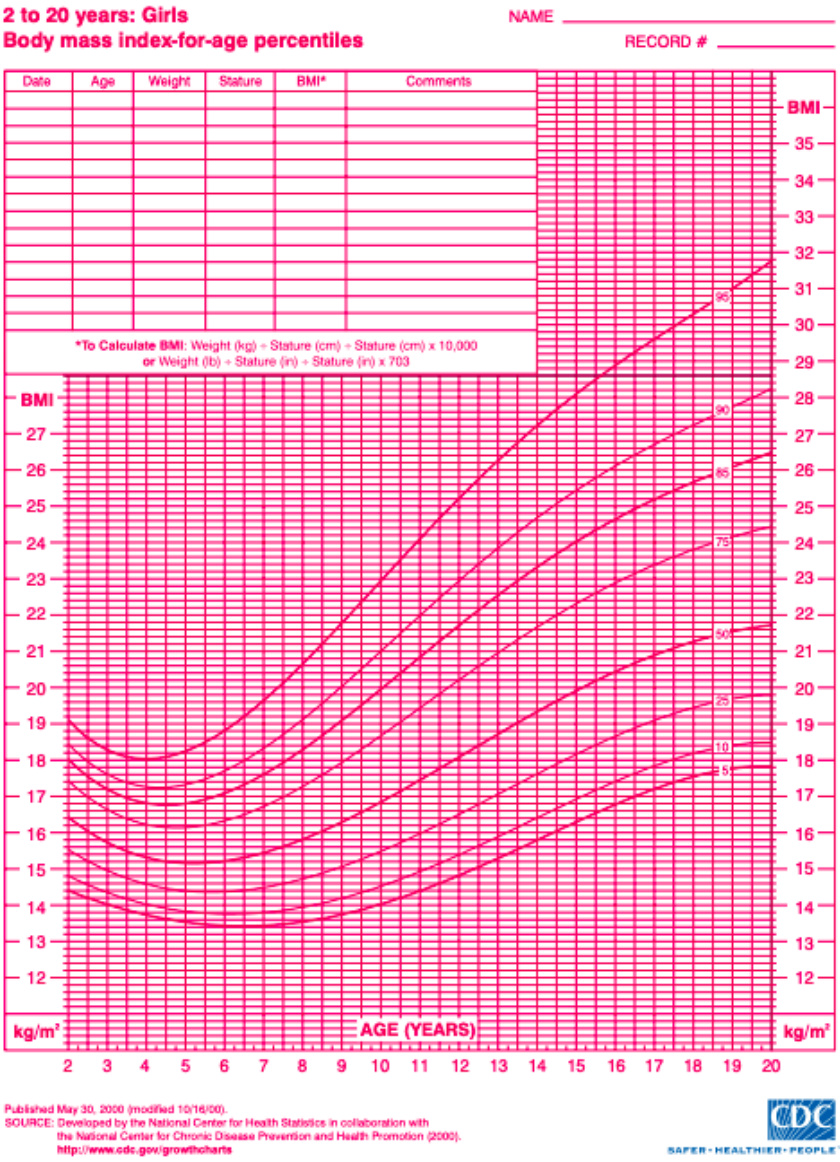


Figure 1: Body mass index-for-age percentiles for girls age 2-20

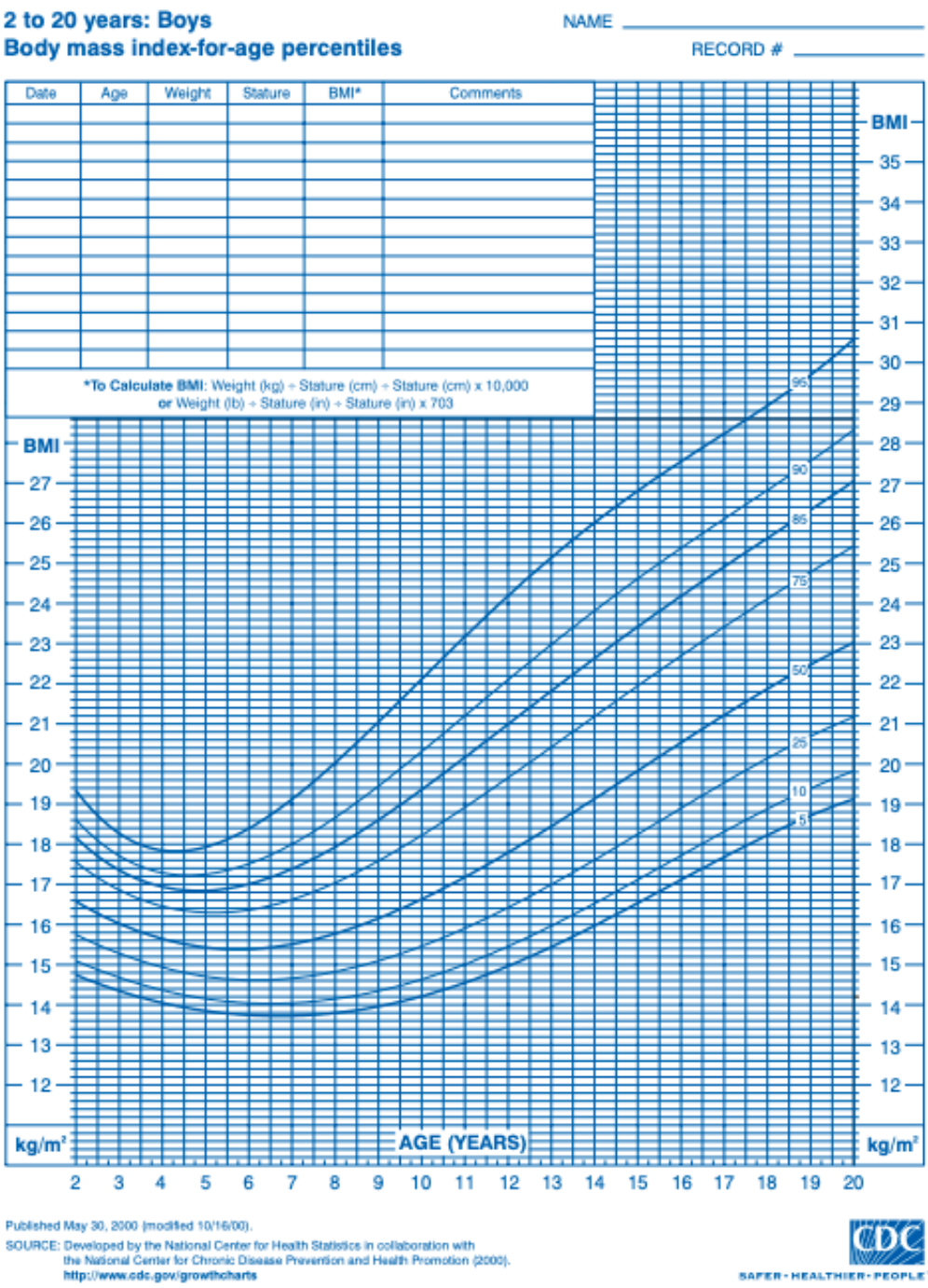


Figure 2: Body mass index-for-age percentiles for boys age 2-20

**Appendix B**

Solmaz Director Interview Guide

1. Can you briefly describe The Solmaz Institute's mission and core objectives?
2. Can you briefly describe the current process of the Solmaz Institute?
3. What evidence-based guidelines or frameworks does The Solmaz Institute follow for childhood obesity prevention and intervention?
    a. Does the Solmaz Institue provide nutrition education? How much per client?
    b. Does the Solmaz Institute provide exercise education and opportunities for exercise? How much?
    c. Does the Solmaz Institue provide mental health counseling for its clients? Why not?
    d. How do you ensure that the nutrition and fitness programs align with current best practices?
4. What training/instruction do interns receive to ensure they are implementing best practices?
    a. How often do you review and update intern training to reflect the latest research and guidelines in childhood obesity prevention?
5. What is your current enrollment process?
6. What does your current documentation system look like?
7. What forms of communication are used between staff and clients
8. How has the program evolved over the past five years?
9. What strategies have been most effective in engaging participants?
10. What challenges have been encountered in program delivery?
11. How is program success currently measured?

12. What key performance indicators or outcome measures do you track to assess the effectiveness of your programs?
    a. How often do you review data to ensure programs are meeting intended health outcomes?
13. How do you incorporate feedback from families, children, and community partners into program improvements?
14. How does the institute ensure that programs are culturally relevant and accessible to diverse populations?
15. Are there any language or literacy barriers that impact program delivery, and how are they addressed?

## Appendix C

MPH Program Competencies

*MPH Competencies Addressed with ILE*

1. Apply epidemiological methods to the breadth of settings and situations in public health practices.
    a. This competency was addressed in MPH 521 Epidemiology with the final systems thinking project. I did mine on a systems thinking approach Type II diabetes.
2. Select Quantitative and Qualitative data collection methods appropriate for a given public health context.
    a. During my ILE project, quantitative methods were used to determine the relationships between response times and staff members through the collection of data from past Solmaz clientele. Quantitative methods were used to determine the adherence to best practice guidelines.
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
    a. During ILE quantitative and qualitative data analysis were conducted using statistical measures to determine the answers to the research questions.
4. Interpret results of data analysis for public health research, policy or practice
    a. This competency was addressed through my Applied Practice Experience. I created a client satisfaction survey and collected data. I interpreted this data and presented it to the community outreach coordinator, so the clinic can use it to inform practices in the future.

5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings.
    a. This competency was demonstrated in MPH 510. For Project 3 I compared the United States public health system's structure, organization, and function to that of the United Kingdon, Germany, and Japan in a paper.
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels.
    a. This competency was addressed during MPH 510 Foundations of Public Health. This was achieved through the completion of discussion board 2, which the class and myself discussed structural bias, inequities, and racism.
7. Assess population needs, assets and capacities that affect communities' health.
    a. This competency was adressed in MPH 535 Program Planning and Implementation. This was achieved through assignments 1 and 2 the description of stakeholders and needs assessment for the "Health Choices for All" program.
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or program
    a. This competency was addressed through my Applied Practice Experience. This was achieved through the creation of my client satisfaction survey, I had to ensure the material was culturally relevant, because the clinic's main population is Hispanic. Additionally, as a member of the clinic's quality committee I helped implement a pilot program for culturally relevant diabetes education.
9. Design a population-based policy, program, project or intervention

    a. This competency was addressed through my Applied Practice Experience. I designed and implemented the first employee vaccination policy at Good Samaritan Clinic.

10. Explain basic principles and tools of budget and resource management
    a. This competency was addressed in MPH 523 Public Health Leadership and Management. This was achieved through the completion of project 2 which was a presentation on understanding organizational budgets.
11. Select methods to evaluate public health programs
    a. This competency was addressed during ILE. This was achieved through secondary data collection and evaluation determining the effectiveness of the Solmaz Institute, a childhood obesity health program.
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence.
    a. This competency was addressed in MPH 525 Public Health Policy. This was achieved through the completion of project 1 which was an evaluation of the affordable care act that included the roles of ethics and evidence.
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
    a. This competency was addressed in MPH 535 Program Planning and Implementation. This was achieved through the completion of project 1, which identified the stakeholders and partnerships for the “Healthy Choices for All” program.
14. Advocate for political, social or economic policies and programs that will improve health in diverse populations

a. This competency was addressed in MPH 535 Program Planning and Implementation and MPH 525 Public Health Policy. In MPH 535 there was advocacy for the program Healthy Choices for All. In MPH 525 this was achieved through project 2 part A and B, in which I wrote an advocacy paper for North Carolina Drinking Water Act.

15. Evaluate policies for their impact on public health and health equity
    a. This competency was addressed MPH 525 Public Health Policy. This was achieved through project 1 and 2 where I examined the Affordable Care Act and the North Carolina Drinking Water Act.
16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making.
    a. This competency was addressed MPH 523 Public Health Leadership and Management. This was achieved through the completion of peer coaching sessions assignment.
17. Apply negotiation and mediation skills to address organizational or community challenges
    a. This competency was addressed MPH 523 Public Health Leadership and Management. This was achieved through the peer coaching sessions assignment.
18. Select communication strategies for different audiences and sectors
    a. This competency was addressed during APE. Various communication strategies were used to relay information to the director, staff, patients, board members and other stakeholders. Each audience requires targeted information with appropriate language.

19. Communicate audience-appropriate public health content, both in writing and through oral presentation
    a. This competency was addressed through my Applied Practice Experience. This was achieved through the presentation of my vaccination policy to the quality committee and my presentation of survey results to the quality committee.
20. Describe the importance of cultural competence in communicating public health content.
    a. This competency was addressed through MPH 555 Health Communication. This was achieved through discussion4 which went over cultural competence and its importance in health communication.
21. Perform effectively on interprofessional teams
    a. This competency was addressed through the use of group projects in every class. Specifically, MPH 535 Program Planning and Implementation and MPH 540 Program Evaluation and Measurement.
22. Apply systems thinking tools to a public health issue
    a. This competency was addressed in MPH 521 Epidemiology. This was achieved through the final systems thinking project which was on Type II diabetes.
23. Distinguish how the dynamic interactions among social systems within communities facilitate or inhibit healthy behaviors
    a. This competency was addressed through MPH 528 Community Engagement. This was achieved through projects on global health.
24. Evaluate the quality of data (validity, reliability, normalcy, etc.) for proper data management
    a. This was addressed through ILE. The quality of data collected was evaluated to ensure reporting to the Solmaz Institute was valid, reliable, and accurate.

25. Justify the need for proper evaluation of programs and policies for the allocation of the necessary resources (time, financial, personnel, planning, etc.)
    a. This was addressed through ILE. Through the process evaluation of the Solmaz Institute there is evidence to support and justify a continued and consistent evaluation of the program. Suggestions were made to the director based on the research into the program.
26. Discuss the application of empowerment theories to facilitate the consensus building process.
    a. This competency was addressed MPH 528 Community Engagement. This was achieved through discussion 8 on empowerment.
27. Evaluate community assets and resources that can be used to enable community organizing and improve the health in a community
    a. This competency was addressed through my Applied Practice Experience. Through the attendance of various community meetings and events I was able to evaluate which resources could be utilized to benefit the clinic.