



Prevención del sobrepeso y la obesidad en preescolares: lecciones aprendidas en Cuenca, Ecuador

Preventing overweight and obesity among preschool children: lessons learned in Cuenca, Ecuador

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ABSTRACT

Introduction: Childhood overweight and obesity are major public health problems globally, including in Ecuador, and there is increasing interest in intervening as early as possible. We previously developed and evaluated a behavioural and educational intervention aiming to improve diet and physical activity habits among children at municipal preschools in Cuenca, Ecuador, after which it was implemented. **Objective:** To describe some of the key lessons learned in the process of intervention development, evaluation, and implementation. **Methods:** We conducted program evaluation using a survey questionnaire with open-ended questions with the coordinators, teachers, and kitchen staff of the preschools that participated in the intervention. **Results:** Human resource changes were a threat to the continued success of the intervention; therefore, these changes need to be anticipated and peer training emphasized. Careful consideration also needs to be given to impact on preschool staff workload. Teachers and other stakeholders like administrators should take ownership of the intervention and play a leadership role, distinct from that of researchers. Regarding the intervention itself, we identified that both fidelity and adaptability were critical for continued success. **Conclusion:** Lessons learned from our setting may be useful to inform the design, evaluation, and implementation of sustainable preschool-based interventions aiming to improve diet and physical activity habits elsewhere.

Keywords: exercise, diet, health, paediatric obesity, Ecuador, Latin America

1. Introduction:

Childhood obesity is a major global public health problem, which is reflected in Ecuador, where nearly one-third of school-age children were overweight or obese in a nationally representative survey in 2012 and 2018 (1,2). School-based interventions with combined diet and physical activity components that also include at-home activities appear to be effective for preventing childhood overweight and obesity (3-7). We therefore decided to generate our own evidence for our local context of Cuenca, Ecuador. In this article, we describe our experiences and lessons learned over an approximately five-year period in our efforts to develop, evaluate, and implement an educational and behavioral intervention that aimed to improve diet and physical activity habits among children attending local municipal preschools.

1.1 The process of intervention development, evaluation, and implementation

In 2014, we began to develop the intervention (8), based on Social Cognitive Theory, which consisted of incorporating new daily activities focused on improving diet and physical activity habits into the existing school curriculum. The activities of the intervention focused on three overarching principles: 1) drinking water instead of sugar-sweetened beverages; 2) eating fruits and vegetables at snack times; and 3) engaging in physical activity rather than screen time during free time. This process was informed through a literature review (9), observation of preschools, focus groups with parents and school staff, and a parent survey about child habits (10).

Once we developed the initial school-based intervention and began examining evaluation strategies, we chose to pilot a 3-month school-based intervention in 2015-2016 and in a separate group of children at the same schools in 2016-2017, we evaluated a 7-month enhanced intervention, which included both a school and home component. The enhanced intervention's home component included activities for children to do with their parents, which were a continuation of school-based activities. Specific training on the intervention

was provided to both the teachers and school kitchen staff; and in the enhanced intervention, teachers trained parents on the home-based activities. Using this approach, we could not determine if either intervention was better than no intervention, but we could determine if the enhanced intervention was better than the 3-month school only intervention. Both interventions were associated with a beneficial effect on parent-reported child diet habits, but we found that the enhanced intervention, when compared with the pilot intervention, was associated with a significant reduction in BMI-for-age z score (8).

Based on the results of the study, we recommended the enhanced intervention be implemented in municipal preschools in Cuenca. After conclusion of the study, we provided the materials to the preschools so that the activities of the intervention could be continued in future cohorts of children. As school staff had already been trained on the intervention, no further training was provided. Although our study showed that the intervention was beneficial, an important question we had was if the intervention could be sustained in the "real world" beyond the research setting. The purpose of this short communication is to describe the factors that influenced the sustainability of the intervention as identified from a program evaluation. We therefore describe some of the key lessons learned in the process of intervention development, evaluation, and implementation.

2. Methods:

In 2019, approximately two years after the implementation of our intervention at municipal preschools in Cuenca, Ecuador, we conducted an internal program evaluation by conducting a survey with nine coordinators (i.e., heads of preschools), thirteen teachers, and twelve kitchen staff to gain insights about how the intervention was continuing and challenges that preschool staff experienced. A questionnaire with open questions was used, which asked about staff turnover for each center and for each class; about the continued use of the recreational and audiovisual material delivered within the project; and about the opportunities and difficulties that arose when

using the didactic material. In addition, we asked about the interest and importance of continuing to teach about nutrition and physical activity for preschoolers. Survey responses were transcribed into a Microsoft Excel spreadsheet where we identified key themes based on staff perceptions and experiences related to the continuity of the intervention.

3. Results:

The program evaluation questionnaires were analyzed by identifying themes in staff responses, which provided information in understanding unforeseen issues with implementation:

3.1 Challenges with implementation

We asked about staff changes since the initial study of the intervention. It was reported that teachers who we trained on the intervention left the school or changed jobs within the school. Teachers were also rotated to classes with different age children within the preschool (other than classes with 3-4 year old children that participated in the intervention) and there was some uncertainty about when these staff changes would occur. For example, "Whenever deemed convenient, the changes are made by the administrator or human resources;" "they [class assignments] generally last the entire school year, some [teachers] are rotated in July-August".

Teachers also reported challenges of the intervention related to their workload: "We already have our lesson planning to fulfill, so it was a great pressure and made it difficult for me to apply everything [from the intervention] successfully".

Kitchen staff highlighted the importance of continued training: "[we would like to] train every year because there are new nutritionists and they have no idea what it's like to work in the kitchen. Many [kitchen staff] do what they need to do, without having the proper knowledge."

Some teaching staff reported losing intervention materials, such as puppets, song

recordings, and books due to teachers moving to other preschools.

3.2 Perceived value of the intervention

The perceived value of the intervention was reinforced as teachers reported that children enjoyed the activities and thought the intervention filled an important gap in the curriculum regarding diet and physical activity habits: "This material was created thinking of a fun way to carry out activities and create habits in children from a very early age and perform physical exercises and avoid a sedentary lifestyle;" "I think the puppets [and other materials] are important to be able to create healthy eating habits and served to teach in a playful way."

4. Discussion:

Overall, we learned three key lessons in our experience developing, evaluating, and implementing an intervention to improve diet and physical activity habits among preschool-aged children in the school setting:

First, secure resources are needed and include not only financial resources, but perhaps most importantly, human resources. In our intervention, training staff was a key component, so any staffing changes (e.g., newly hired teachers) had direct implications for the intervention's continued success, which is a phenomenon observed in other settings (11). The impact of an intervention on staff workload also needs to be carefully considered, based on the insights from teachers involved in our intervention, and from other settings (11).

Second, stakeholders at multiple levels—teachers, kitchen staff, school administrators, and educational authorities—need to have ownership of the intervention and take a leadership role, certainly not just the researchers who test if the intervention is efficacious. Leadership at multiple levels is a critical factor that has also been identified in other settings (11, 12). The buy-in and support of local education authorities and school administrators is essential to make an intervention possible, but the importance of teachers and other school personnel in owning

and delivering the intervention should not be underestimated.

Third, although not a novel aspect, our experience further highlighted the importance of how interventions should be developed with sustainability in mind. Our intervention provided education to teachers and kitchen staff because they typically work in the preschools for many years, and such education could be an investment for many future cohorts of children. Aside from the human resources aspect, a key consideration for sustainability is adaptability, which requires flexibility of evidence to ensure contextual relevance of the intervention to the population it is applied (13). We developed the intervention considering the local environment and culture, which are distinct in Cuenca from other regions in Ecuador. However, adaptability should also be considered at an even more proximal level to the children, such as the family and school levels. When we developed the intervention, we carefully examined families' structures, socioeconomic status, and household food insecurity (10), which varied substantially among the municipal preschools. Therefore, the home activities that children participated in were either low-cost or no-cost and were adaptable to any family lifestyle or structure.

Although adaptability emphasizes delivering the intervention in different contexts, adaptability must be considered after fidelity, or degree to which the intervention is implemented as intended. Regarding fidelity, researchers visited preschools weekly during the intervention to answer questions and ask about any issues. Although this was helpful for both parties, we think that it may have been highly informative to do observation and see how activities were being implemented, as the intervention was a complex one. Information from observation could ultimately improve the intervention itself and help improve the confidence and knowledge of preschool staff. Evidence from long-term follow-up of children in Colombia who participated in a cardiovascular health promotion in preschool suggested that fidelity was a critical factor to success, as a dose-response relationship with adherence to the intervention and outcomes was observed (14).

A limitation of our intervention was that preschool teachers had a limited role in the design of the intervention. We conducted focus groups with school staff to inform the design of the intervention, but perhaps, a more active role for teachers, such as designing activities themselves with the input of nutrition and physical activity experts would have allowed greater ownership of the intervention and a more involved leadership role. We would anticipate that this could have allowed for more successful implementation.

Based on our evaluation, we recommend to lessen the burden on teachers, nutrition education and physical activity should be fully integrated into the mandated curriculum for children. This way, the activities that were introduced in our intervention would simply be part of the curriculum, rather than be something additional that teachers are responsible for carrying out. Because curricula are often already overcrowded (12), we think that evidence from empirical research, such as our study (8), will be key in convincing educational authorities about the importance of diet and physical activity. Although kitchen staff were not responsible for implementing activities directly with the children in our intervention, their work could be made easier by providing them with more nutrition education that provides easy-to-follow recommendations to modify menus and recipes.

We also think it would be beneficial to make the intervention school-wide and train all staff, rather than just focusing on the teachers who taught 3-4 year olds because teachers can change within the school. We would also recommend that future interventions evaluate peer training among teachers during the research phase, so that when the study ends, new staff can be trained with fewer external resources.

5. Conclusions

We think that the challenges and successes of our initial experiences may be informative in other settings, as childhood obesity is a worldwide problem and novel approaches are needed to address it. Many different factors

have been identified as potentially relevant to sustaining interventions for obesity prevention: resourcing, leadership, workforce development, community engagement, partnerships, policy, communications, adaptability, evaluation, and governance (13), many of which were highlighted in our lessons learned. To achieve long-term goals in our setting and others, continuous surveillance will be needed to understand the evolving situation and to meet the needs of children, parents and guardians, teachers, and other school staff.

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Conflicts of Interest:

The authors declare no conflict of interest.

Limitation of liability:

All views expressed in the manuscript are entirely the responsibility of the authors

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None

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