

Promotion of healthy eating habits in a preschool population: experience in a municipality in Colombia

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ABSTRACT

Objective: promote a healthy diet in children between 4 and 5 years old and in their parents and caregivers from a preschool community in a municipality of Colombia.

Design: Participatory action research with children (n = 47) between 4 and 5 years old, parents and their caregivers from four (4) kindergartens.

Setting: this study was carried out in four kindergartens in the municipality of Sopó in Cundinamarca (Colombia).

Participants: For this, a working group with multiple community actors was established: forty-seven children between 4 and 5 years old, (n = 47), six teachers (n = 6), a nutritionist (n = 1), twenty parents (n = 20) and the support of the municipality's health department. The intervention was carried out during the first six months of 2019.

Results: the community knows and understands what eating healthy means, the benefits of eating healthy, and its importance for proper development. Children start identifying fruits and vegetables easily, furthermore, they start showing interest in planting, cultivation, and the consumption of this. Parents and caregivers identify the pillars of healthy eating, also they show great motivation to teach healthy lifestyle habits to their children and family.

Conclusions: start healthy eating habits in early childhood is a determining factor of proper development and growth, consequently it is important to introduce these habits in children since the preschool period in the hands of caregivers, who are considered important to guarantee and promote it.

Keywords: *start, work, habits, early, promote.*

INTRODUCTION

Early childhood, corresponding to children between 0 and 5 years old, is considered a critical period for cognitive development and depends largely on an adequate diet that includes carbohydrates, lipids, proteins, vitamins, minerals, and water.[1, 2] Associated with this, an adequate community education of children, parents, and caregivers is essential, highlighting the importance of this topic and its close relationship with an adequate neurodevelopment of the child, as well as with the reduction of poverty rates and a healthy adulthood.[3, 4]

Additionally, in developing countries, inequity has led to a limitation of opportunities in access to education and healthy eating, both fundamental in the adequate growth and development of early childhood,[5, 6] which has generated an increase in poverty and malnutrition as well as the complications associated with them.[7, 8] Thus, in recent decades, the malnourished Colombian and Latin American child population has increased, mainly due to overweight and obesity.[2, 7, 9] Similarly, barriers to access to education lead to significant school absenteeism, seeing that one in six children does not have access to school and, as expected, this prevails in areas with high poverty rates.[6, 10] Highlighting the importance of education as a preventive tool for poverty, malnutrition, and non-communicable diseases.[11-13]

For this reason, the integration of kindergartens and their members are fundamental in the integral development of the child, since these institutions establish educational and well-being guidelines, in which nutrition, interaction with peers, among others, guaranteeing a child a healthy adulthood.[14, 15] Usually, these institutions follow guidelines from different organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), to establish recommendations and diets that guarantee adequate nutritional development.[14, 16]

Therefore, and based on the integration with a preschool community and the documentation of different activities on food and physical activity, the objective of this work was to promote healthy

eating habits in children aged 4 to 5 years, parents and their caregivers of a preschool community in a municipality of Colombia, which integrated the educational team and local government entities from the perspective of Community Oriented Primary Care (COPC).[17]

METHODS

A Participatory Action Research (PAR) was carried out in four kindergartens in the municipality of Sopó in Cundinamarca (Colombia). For this, a working group with multiple community actors was established: forty-seven children between 4 and 5 years old, (n = 47), six teachers (n = 6), a nutritionist (n = 1), twenty parents (n = 20) and the support of the municipality's health department. The intervention was carried out during the first six months of 2019.

PAR is a method that involves solving problems with the community, for this, it begins with a community diagnosis, and later, in a participatory way, the problems encountered are resolved. In this method, different information collection methods (quantitative or qualitative) can be used in the diagnosis, intervention of problems, evaluation of results, community appropriation, and final reflection of the process.[17-19]

Before starting the research, ethical, administrative, and legal approval was obtained from the University and the municipality, also, an informed consent was signed by the parents and caregivers, to authorize the activities and the taking of photographs. Likewise, the children were clearly explained what the process consisted of, using language adapted for them.

In this way, the investigation began with the approach to the community, to know the context and begin the exploration of community problems.

In the first place, a community diagnosis was carried out, which was based on a documentary review of information sources in the municipality, national policies related to the study population, and a review of the literature.[11, 19, 20] Likewise, semi-structured interviews (n = 7) were carried out with the nutritionist of the municipality and the teachers

of the garden.[21] Also, information was documented through a nutritional diary to identify family eating patterns at home and through “talking maps” children's knowledge about healthy eating was evaluated. Additionally, growth and development screening were performed by taking anthropometric measurements using WHO growth standards. [22, 23]

With all of the above, the main problems that the community presented were established, and with them, a list of problems was formulated which was analyzed and characterized with the SEVER

method, where each problem found in the community was framed according to 5 basic points and A score of 0 to 10 was assigned to each of them: Severity, Extension, Vulnerability, Trend or Evolution over time and local repercussion. Next, these problems were prioritized according to an order of relevance to define the main problem to be worked on, which was agreed with teachers and the municipal administration: "The children of the Sopó kindergartens have inadequate eating habits at home". (Table 1)

TABLE 1: Community problems and prioritization of them through the SEVER method (Severity, Extension, Vulnerability, Evolution, Repercussion.)

Problems	Variables					Score
	S	E	V	E	R	
Inadequate eating habits.	9	7	8	5	8	37
Little physical activity.	7	5	5	2	7	26
Low economic resources.	8	9	3	1	6	27
High risk of being overweight.	6	6	8	2	1	23
Low parental involvement.	6	8	9	2	2	27
Non-compliance with institutional teachings.	5	5	8	3	1	22
Low educational level of parents.	6	5	6	4	3	24
Negligence in parenting guidelines.	6	4	5	4	3	22
Increase in non-communicable diseases.	3	3	8	6	6	26
Increase in infectious diseases.	5	5	8	5	4	27

Subsequently, work axes were established aimed at improving the problem based on the

intervention structured in three work axes. (Table 2)

TABLE 2: Areas of work and thematic categories of healthy eating.

Category	Description	Activities
Understanding the importance of a healthy diet.	Children's understanding of the importance of including healthy foods in their diet, also relating them to proper growth and development.	Children Interactive activities with vegetables and fruits: harvesting the garden and activity in the kitchen. Activity of differentiation between healthy and unhealthy foods Caregivers Activity differentiation between healthy and unhealthy foods.

Education and motivation about healthy eating habits.	The children of the municipality know the benefits of healthy eating and the disadvantages of ultra-processed foods.	Children Reproduction of audiovisual material VeggieTales Find the healthy food activity Caregivers Workshops to impart nutrition knowledge Brochure on healthy eating
Maintenance of healthy eating habits by caregivers in their daily life.	Parents and teachers understand the advantages of healthy eating for the proper development of children and apply this knowledge in their daily lives.	Caregivers Conducting and collecting surveys to determine knowledge about food Workshop on final feedback and socialization of the result

Before starting the activities, field diaries were applied to each participating child to document the process. The children's level of knowledge was established and standardized by using talking maps (n = 47) and behavioral observation, both of which were analyzed with the support of institutional staff. For caregivers, a semi-structured interview (n = 7) was conducted during a group dynamic activity in which knowledge about healthy eating was determined. The interviews and talking maps were recorded and, besides, the researchers took field notes. The data obtained were organized and analyzed by thematic categories according to the lines of work. (Table 2)

In the end, compliance with each of the axes was evaluated, and the results and lessons learned were presented and validated through a discussion group, which was attended by nine mothers, two teachers, and a nutritionist. Elements for improvement were established and the conditions for adopting healthy lifestyle habits and continuing the initiative were reflected on.

RESULTS

Initially, the environmental assessment was carried out, later through the documentary review of seven (n = 7) official documents, fifteen (n = 15) semi-structured interviews, and one (n = 1) participant observation, a community diagnosis

was established; in which different problems were identified, among which the diet, the environmental axis, the acute respiratory disease, the low educational level of the parents stand out. From this list of problems, the prioritization was carried out jointly between the officials and caregivers of the children, through the SEVER method where "inadequate eating habits" were established as the main problem, of which different activities and a plan organized into three categories: Education and motivation about eating habits, Understanding the importance of a healthy diet and Application of healthy eating habits in your daily life. (Table 2)

Understanding the importance of a healthy diet

As the main activity of the research, a garden was carried out where the children interacted with the vegetables and the environment, all understood the relationship between planting and healthy food consumption. By harvesting and tasting the food grown, the children recognized the importance of consuming fruits and vegetables. Also, it can be stated that the majority of the population that participated, (n = 38) adequately differentiates between "healthy" and "unhealthy" foods since they recognize that fruits, vegetables, and proteins are "healthy" foods and in terms of ultra-processed foods (n = 34) are considered "unhealthy". (Table 3)

TABLE 3: Verbatims from the category understanding the importance of healthy eating by children, parents, and caregivers.

Subcategory	Verbatims
Understanding the importance of planting and harvesting food for consumption.	Child 1: "How nice how vegetables grow"
	Child 2: "I like lettuce"
	Girl 1: "Coriander smells very good"
	Girl 2: "They need water like we need food to grow strong"
Understanding the importance of consuming fruits and vegetables.	Child 1: "The kitchen serves us fruit every day"
	Girl 1: "I like zucchini, it's very tasty"
	Girl 2: "I eat fruits to grow strong"
	Girl 3: "This salad is very tasty"
Understanding the nutritional value of "Healthy" VS "Unhealthy" foods	Child 1: "Soda is not healthy"
	Girl 1: "The pizza is good, but it is not good"
	Girl 2: "If the chicken is fried, it hurts us"
	Girl 3: "Ice cream is very tasty, but it is not very healthy"
Understand and reinforce the importance of the composition of the healthy plate and its portions.	Mother 1: "At home, we try to eat every 3 hours"
	Mother 2: "You should eat only one carbohydrate per meal"
	Grandma 1: "It is important to eat carbohydrates, vegetables, and proteins in your meal"
Understanding and consolidation of the types of food, and relation with the nutritional value of each one "Healthy" VS "Unhealthy"	Mother 3: "Banana is a carbohydrate"
	Mother 4: "Fruits are healthy and necessary foods"
	Teacher 1: "In my house, we have both for breakfast that has vegetables, flour and proteins"
Inadequate understanding of the nutritional value of certain foods (Juices, Animal protein)	Parent 1: "Juice is good because it is fruit"
	Grandmother 2: "In my house we are vegetarians, so my daughter eats a lot of vegetables and fruits"
Understanding of changes that would positively influence the diet in their families.	Mother 5: "So we can make juice without adding sugar"
	Mother 6: "I'm going to change the yogurt for a fruit"

Regarding the caregivers, the majority (n = 13) recognized and appropriated the knowledge about the healthy plate and its portions, reinforcing the classification of certain foods according to the category's fruits and vegetables, proteins, and carbohydrates. Besides, they correctly classify most of the foods as "healthy" and "unhealthy" although it was observed that 33% of caregivers consider juices to be healthy foods. On the other hand, it was identified that one of the caregivers (n = 1) considers proteins of animal origin as "unhealthy", being a family with a vegetarian diet. However, the caregivers were willing to make modifications to the diet to make it as healthy as possible. (Table 3)

Education and motivation about healthy eating habits.

Through the testimonies expressed by the study participants, described in the annexes, it was determined that all (n = 47) of the children were motivated to include healthy foods in their diet, relating it to the academic activity (sowing and harvesting) carried out. Additionally, the majority of children (n = 30) recognize the benefit of implementing a healthy diet. However, a group of children (n = 6) showed less interest in consuming certain fruits and vegetables due to personal preferences such as the taste and consistency of certain foods. (Table 4)

TABLE 4: Verbatims of the motivation category on healthy eating habits by children, parents, and caregivers.

Subcategory	Verbatims
Motivation (n = 47) for the inclusion of foods with high nutritional value in their diets	Child 1: "We are going to eat what we sow"
	Girl 1: "The zucchini is very tasty"
	Girl 2: "I like lettuce"
Motivation (n = 30) to include foods in their diets due to their "healthy" nature	Child 2: "I want to eat healthy to be strong"
	Girl 3 "These vegetables will make us grow healthy"
	Girl 4: "Fruits make us not sick"
Disinterest (n = 6) in including "healthy" foods due to their characteristics or personal preferences	Child 1: "Soursop feels ugly"
	Child 2: "I don't like melon"
	Girl 1: "I prefer to eat ice cream than apple"
Motivated parents and caregivers to change and improve their eating habits.	Mother 1: "Now my son doesn't fight me to eat vegetables"
	Mother 2: "My girl is very motivated with the school garden"
	Mother 3: "My son wants to help in the kitchen"
Socioeconomic and time constraints interfere with the desire to implement a "healthy" diet	Mother 1: "Meat and chicken are very expensive"
	Mother 2: "It's faster to give him a package"
	Mother 3: "I arrive too tired to start cooking"

The caregivers report motivation in modifying the habits of their family nucleus when they see the enthusiasm in their children regarding the processes of planting, harvesting, and preparing food. However, certain caregivers (n = 6) do not consider it possible to apply a healthy diet given their socioeconomic conditions and lack of time-related to long working hours. (Table 4)

Maintenance of healthy eating habits by caregivers in their daily life.

With the activities carried out, it was found that the majority of parents have the desire to maintain healthy eating habits at home, showing

positive attitudes of children towards processes related to food production, they refer to a heartfelt willingness to continue implementing methods at home to maintain a healthy diet. The teachers were grateful for being involved in the research process since they considered that their opinions were taken into account when carrying out the activities. In this way, they claimed to be an example for the minors, and they feel motivated to follow healthy eating habits. In turn, they assertively conclude the relationship between healthy eating and proper development. (Table 5)

TABLE 5: Verbatims of the category maintenance of healthy eating habits by children, parents, and caregivers.

Subcategory	Verbatims
Desire to maintain healthy eating habits at home.	Mother 1: "It is very good that they have done these activities because now my son wants to try the food we prepare at home"
	Mother 2: "My daughter is more interested in what I am going to cook and is enjoying eating healthy"
Critical analysis of the activities and how they are, as well as the implementation of a healthy diet, improves health.	Teacher: "The girl who is a vegetarian has never missed the garden because she is sick, her diet is very good"
	Teacher: "Having left the garden in operation motivates us to carry out activities that allow children to find fun with healthy food"

DISCUSSION

In recent years, the prevalence of childhood obesity has been determined 10 times higher than 40 years ago, where 25% of the child population is overweight or obese, furthermore, there has been an increase in non-communicable diseases in adults such as they are high blood pressure, cardiovascular disease and Diabetes Mellitus, diseases closely related to poor eating habits.[24] Therefore, it is imperative to guarantee adequate nutrition from preschool age, since this is considered a critical stage to stimulate the adequate growth and development of children.[11, 25]

Given the above, it is essential to address this issue from an inclusive perspective, bringing together institutional actors in Colombia, such as the Colombian Institute of Family Welfare, regional health entities, and those directly related to the training of children (parents, caregivers, educational personnel),[15, 26] this being the basis of community interventions, the research sought to address inadequate eating habits at home by strengthening education in these actors.[27]

The PAR methodology implemented allowed a greater approach to the community, working together with the Municipality's Health Secretariat, the directives of the kindergartens, the teachers, the caregivers, and the children. With their support, through a study of the characteristics of the municipality, the regional problem was determined, thus allowing to propose the intervention carried out focused on improving eating habits through interventions that dynamically integrate all the parties involved to obtain favorable, reproducible, and definitive.[18, 29]

It is important to highlight the practicality of obtaining information in a community when using PAR because it is easier for members of the population to express their problems or disagreements on a specific topic, they mention possible intervention strategies as a personal contribution or as a result of previous interventions that have been carried out to try to solve specific situations. On the other hand, it is important to mention that this does not only involve the main research group but allows

integration with different groups such as the population most affected by a problem, the population affected indirectly, academics interested in the subject. principal, personnel of health and humanization projects, and any member of the community in general without the need to be related or affected by the main problem.[17]

At the beginning of the study, conceptual deficiencies and confusion were determined in the recognition of fruits and vegetables comparable with previous descriptions in the literature, for which it was necessary to carry out didactic educational interventions for conceptual reinforcement, supported by the knowledge and expertise of the teachers.[30] Another challenge was to illustrate in children the difference in idiosyncratic concepts; Initially, most of the sample affirmed that for a food to be "rich" or to eat them regularly, it should be "good", being the case of packaged and fried foods. Demonstrating that some preschool children do not distinguish between what is pleasant or what is consumed regularly and what is healthy.[31] For this reason, we must insist on educating children about this distinction and other misconceptions, as well as enlightening parents and caregivers about the importance of a healthy diet and the impact they have on the diet and health of their children.[32]

On the other hand, the realization of a school garden allowed observing a notable increase in the interest of children towards fruits and vegetables, this, justified by the commitment they feel with the activity. It was also observed that the children felt motivated, encouraged, and curious about the work in it, these characteristics being previously described in the literature. At the end and after the food was harvested, the children, in addition to recognizing the cultivated food satisfactorily, had the initiative to taste it.[33]

Concerning caregivers, important results were documented regarding healthy eating knowledge. The vast majority of parents consider the group of fruits and vegetables as healthy foods, with a few exceptions that, upon inquiry, their misclassification was for reasons of taste rather than nutritional benefit. Regarding protein foods, only one case did not consider chicken as a

healthy food, later it was clarified that he was the father of a vegetarian family nucleus, so they did not see animal proteins as harmful. About ultra-processed foods, all parents considered these as unhealthy, however, in the case of artificial juices, the vast majority of parents classify them as healthy foods, a common mistake in daily practice.[34]

It can be concluded that, in general, parents know the importance of routinely including proteins and fruits in the children's diet, according to the results, an application of this knowledge by most parents is evidenced. However, the consumption of vegetables should be reinforced, since an insufficient intake of them was perceived in the children's diet, it is also important to emphasize to caregivers the importance of providing quality food and avoiding, as far as possible, the administration of ultra-processed foods to children.[35]

Finally, throughout the project there was evidence of poor participation by parents in the children's school activities, two workshops were held, in which attendance was low. When investigating the cause, it was found that the parents' work schedules make it difficult for them to attend. However, when organizing activities to be carried out at home, the cooperation of the caregivers was, in the same way, very low. This poor participation of parents has already been previously documented, and it is considered that it should be one of the pillars to be addressed to prevent diseases from childhood and achieve continuity of the education provided in preschool.[35]

CONCLUSIONS

Healthy eating in early childhood is a cornerstone in proper growth and development, so it is important to instill these habits in children from the preschool period hand in hand as well as their parents and caregivers, who play a fundamental role in ensuring and promote it.

Based on the work carried out in conjunction with the kindergarten community of a Colombian municipality, it is necessary to highlight the importance of actively promoting healthy habits in this population, particularly those related to healthy eating, to establish an adequate growth

and development, which additionally provides a potential for change in eating patterns, generally promoted by caregivers.

Additionally, parents and caregivers establish routines that promote and ensure the integral development of the child, which impact on sustainable health initiatives within their community, work carried out jointly by all actors, however, the disinterest of a large part of The parents in integrating these activities, but the adequate long-term outcome of the intervention at risk, so it is imperative to promote their active participation.

Finally, children in the school period and their environments represent an opportunity to adopt healthy eating habits early, to be maintained throughout life.

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Interest Conflict

None

Authority Statement

All the authors participated in the planning of the research, in the execution of activities, and the collection of information; likewise, all participated in the analysis of the results and the writing and final approval of the manuscript.

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