EDUCATIONAL INTERVENTIONS IN THE PROMOTION OF HEALTHY EATING IN SCHOOLS

INTERVENÇÕES EDUCATIVAS NA PROMOÇÃO DA ALIMENTAÇÃO SAUDÁVEL EM ESCOLARES INTERVENCIONES EDUCATIVAS EN LA PROMOCIÓN DE LA ALIMENTACIÓN SALUDABLE EN ESCOLARES

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ABSTRACT

Objective: to identify the types of educational interventions in promoting healthy eating in schoolchildren. **Method:** integrative review between January 2010 and May 2018, in which articles were selected in Portuguese, English and Spanish in the databases PUBMED / MEDLINE, CINAHL, LILACS, BDNF, SCOPUS, CUIDEN, COCHRANE, WEB of SCIENCE, IBECs and in the SciELO virtual library. Data was categorized in relation to the types of technologies and the topics addressed. **Results:** the sample was constituted by 17 articles, five of which dealt with healthy eating practices; four, prevention of overweight and obesity and eight, food and nutritional security. All have used lightweight and light-hard technologies and six, hard technology. Several educational interventions were used. **Conclusion:** in order to carry out educational interventions, various resources are used, from the simplest to the most sophisticated, and their effectiveness will be based on the involvement of the school community and the effective participation of parents or guardians. The school environment can be considered as the important place for promoting health through the acquisition of good eating habits. **Descriptors:** Health Education; Food and Nutrition Education; School Health Services; Food Habits; Teaching Materials; Child.

RESUMO

Objetivo: identificar os tipos de intervenções educativas na promoção da alimentação saudável em escolares. **Método:** revisão integrativa, entre janeiro de 2010 a maio de 2018, em que se selecionaram artigos em português, inglês e espanhol nas bases de dados PUBMED/MEDLINE, CINAHL, LILACS, BDNF, SCOPUS, CUIDEN, COCHRANE, WEB of SCIENCE, IBECs e na biblioteca virtual SciELO. Categorizaram-se os dados em relação aos tipos de tecnologias e às temáticas abordadas. **Resultados:** constituiu-se a amostra por 17 artigos, sendo que cinco abordavam práticas alimentares saudáveis; quatro, prevenção do excesso de peso e obesidade e oito, segurança alimentar e nutricional. Todos utilizaram as tecnologias leve e leve-dura e seis, a tecnologia dura. Diversas intervenções educativas foram utilizadas. **Conclusão:** para a realização de intervenções educativas, utilizam-se diversos recursos, dos mais simples aos mais sofisticados, e sua efetividade dar-se-á a partir do envolvimento da comunidade escolar e pela participação efetiva dos pais ou responsáveis. Pode-se considerar o ambiente escolar o local importante para a promoção da saúde a partir da aquisição de bons hábitos alimentares. **Descritores:** Educação em Saúde; Educação Alimentar e Nutricional; Serviços de Saúde Escolar; Hábitos Alimentares; Materiais de Ensino; Criança.

RESUMEN

Objetivo: identificar los tipos de intervenciones educativas en la promoción de la alimentación sana en los escolares. **Método:** revisión integradora, desde enero 2010 hasta mayo 2018, en que se seleccionaron artículos en portugués, Inglés y Español, en las bases de datos PubMed / MEDLINE, CINAHL, LILACS, BDNF, SCOPUS, CUIDEN, Cochrane, Web of Science, y IBECs en la biblioteca virtual SciELO. Se categorizaron los datos en relación a los tipos de tecnologías y las temáticas abordadas. **Resultados:** se constituyó la muestra por 17 artículos, siendo que cinco abordaban prácticas alimentarias saludables, cuatro, prevención del exceso de peso y obesidad y, ocho, seguridad alimentaria y nutricional. Todos utilizaron las tecnologías leviana y leviana-dura. Se utilizaron diversas intervenciones educativas. **Conclusión:** para la realización de intervenciones educativas, se utilizan diversos recursos, de lo más simple a los más sofisticados, y su efectividad se dará a partir del involucramiento de la comunidad escolar y por la participación efectiva de los padres o responsables. Se puede considerar el ambiente escolar el lugar importante para la promoción de la salud a partir de la adquisición de buenos hábitos alimentarios. **Descriptores:** Educación em Salud; Serviços de Saúde Escolar; Educação Alimentaria y Nutricional; Hábitos Alimenticios; Materiales de Enseñanza; Niño.

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INTRODUCTION

It is recommended that public policies on food and nutrition aim to stimulate the population to have adequate food. One of the tools for promoting healthy eating habits is education.¹ The school is a space for the promotion of health, mainly in the formation of the knowledge of the critical citizen, stimulating the autonomy, the exercise of the rights and duties, the abilities, the choice for healthier attitudes and the control of their health conditions and quality of life.²

It is understood that, among the actions developed in the school environment, the promotion of healthy eating should include the whole school community including students, parents or guardians, teachers, employees, lunch boxes and those responsible for providing meals and / or snacks.²⁻³

It is believed that the child's nutrition should ensure the provision of sufficient food in nutritional quality and quantity to meet nutritional needs and ensure adequate growth and development. Healthy eating habits in childhood may prevent chronic degenerative diseases in adulthood such as diabetes, obesity, neoplasms, heart disease and hypertension.⁴⁻⁵

Health education actions can be considered as an important tool in adhering to healthy eating habits through didactic procedures that take into account the socioeconomic and cultural conditions of individuals. The careful selection of this action can contribute decisively to the learning favoring the possibility of success in the behavior change process.⁶

It is added that the role of health professionals in promoting healthy eating practices is to carry out interventions aimed at changes in undesirable or harmful eating habits and to refer children with nutritional status that is inadequate to nutritional assistance, whether individual or specific group oriented.⁶ Among the professionals involved in the actions of the Health in the School Program (HSP), the nurse stands out among the professionals in basic care, due to the different attributions.⁷

The objective of this study was to address the need for schoolchildren to be adequately informed about food, to identify the types of educational interventions in promoting healthy eating in schoolchildren.

METHOD

It is an integrative review, fulfilling six stages of execution: 1) Identification of the theme, selection of the hypothesis or guiding question; 2) Construction of inclusion / exclusion criteria of studies and sampling or search in the literature; 3) Categorization of the studies defining the information to be extracted from the selected studies; 4) Full reading of the studies; 5) Interpretation of results; 6) Review presentation.⁸

This study was based on the following question: Which educational interventions used to promote healthy eating in schoolchildren?

They were chosen as inclusion criteria: original full text articles whose population was of children in the age group from seven to 11 years of age; published in Portuguese, English and Spanish; in the period from January 2010 to May 2018. The exclusion criteria were: theses, dissertations, editorials, reports of experience, review studies, theoretical reflections and reviews.

Studies were carried out in the databases: Medical Literature Analysis and Retrieval System Online (PUBMED / MEDLINE); Cumulative Index to Nursing and Allied Health Literature (CINAHL); Latin American and Caribbean Literature in Health Sciences (LILACS); Nursing Database (BDENF); SCOPUS; Bibliographic Database of the Index Foundation (CUIDEN); Cochrane Library (COCHRANE); Science Citation Index Expanded, Social Sciences Citation Index and Arts and Humanities Citation Index (WEB of SCIENCE); Spanish Bibliographical Index of Health Sciences (IBECS) and virtual library Scientific Electronic Library Online (SciELO).

The research and the selection of the articles by two independent reviewers were carried out in May 2018, from the Health Sciences Descriptors (DeCS) and the Medical Subject Heading (MESH): Health Education; Eating habits; Teaching and Child Materials and English correspondents Health Education; Food Habits; Teaching Materials and Child. In Spanish, the following were searched for: Educación em Salud; Eating Habits; Materiales de Enseñanza and Niño, using the boolean operators "or" and "and", and 134 articles were found when associating the four descriptors, according to figure 1.

Databases / Virtual Library Descriptors	Pubmed/Medline	Web of Science	Cinah	SciELO	Lilacs	Bdenf	Ibecs	Scopus	Cuiden	B Cochrane Library	Total
Health education	256435	103.644	3031	8 932	6290	1498	631	583,435	8643	23337	969086
Health Education and Eating Habits	7337	738	89	78	51	13	10	5,393	30	157	13790
Education in Health and Eating Habits and Teaching Materials	172	4	4	0	0	0	0	45	0	3	224
Education in Health and Eating Habits and Children and Teaching Materials	111	3	4	0	0	0	0	13	0	3	134
Articles that correlated with the guiding question	12	3	3	0	0	0	0	10	0	1	29

Figure 1. Number of articles by databases and in the virtual library according to the cross-referencing of the descriptors. Recife (PE), Brazil, 2018.

After reading the titles and respective abstracts, 29 articles were selected that had correlation with the guiding question and were excluded 105 because they met the exclusion criteria (theses, dissertations, editorials, reports of experience, review studies, theoretical reflections, reviews and articles that had no correlation with the guiding question). Among the 29 articles selected, six were duplicated in the databases, computing them only once and resulting in a sample of 23 articles. The selected articles were read in full to obtain the data through the use of the instrument validated by Ursi, which includes: title, periodical (year, volume, number and pages), authors, type of publication, methodological characteristics, objectives, sample, data processing, results, conclusions.⁹ Regarding the methodological rigor, the CASP form was used considering the identification and clarity in the description of the methods employed, inclusion / exclusion criteria, data collection, analysis process, results and limitations.¹⁰ In this stage, six articles were excluded, since they did not meet all the

criteria established in level A, that is, they did not obtain between seven and ten points.

The final sample consisted of seventeen articles (figure 1) that were evaluated for the level of evidence, according to the hierarchical classification by the methodological approach adopted by Stillwell, in: Level I - systematic reviews or meta-analyzes; Level II - randomized controlled trials; Level III - clinical trials without randomization; Level IV - cohort or case-control studies; Level V - systematic reviews of descriptive and qualitative studies; Level VI - descriptive or qualitative studies and Level VII - opinions of authorities and / or expert committee reports.¹¹

The selected studies were categorized according to the technologies adopted in the interventions according to Mehry's classification (hard technology, light-hard technology, light technology).¹² The themes were categorized from the content analysis¹³ in: Food practices healthy; Prevention of overweight and obesity; Food and nutrition security.

Figure 1. Flowchart of Selection of studies. Recife (PE), Brazil, 2018.

RESULTS

It is described among the 17 articles in the final sample, 15 were written in the English language;¹⁴⁻³⁰ one in Spanish²³ and one, in Portuguese.²⁶ As regards the year of publication, three were published in 2017;^{14-5,20} three in 2016;^{16,19,23} two, in 2015,^{17,24} three, in the year 2013;^{18,21,25} four, in 2012^{22,26-8} and two, in 2011.²⁹⁻³⁰ No articles were published in the year 2014. Four databases were indexed in PubMed / Medline;^{14,16,21,30} one, in the Cinahl database;¹⁵ two, in the Web of Science;^{17, 24} four in PUBMED / MEDLINE and Scopus;^{18,25-7} four, were indexed in Scopus;^{19-20,23,28} two were indexed in the databases PUBMED / MEDLINE, SCOPUS, CINAHL, COCHRANE.^{22,29} No articles found in the Lilacs, Ibecs, Bdenf, Cuiden and SciELO virtual libraries.

As to the level of evidence, ten articles were classified in level II;^{14,16,18-9,21-2,25,28-30} three were classified in level III;^{15,20,27} one was classified at level V²⁴ and three were classified at level VI.^{17,23,26}

The articles were divided into three categories, according to the themes addressed: Healthy eating practices;¹⁴⁻⁸ Prevention of overweight and obesity;¹⁹⁻²² Food and nutrition security.²³⁻³⁰

It is complemented, in relation to the type of technology, that all articles used light and hard-light technologies¹⁴⁻³⁰ and six articles used hard technology.^{14,16,20,22-3,30}

The educational interventions used to promote healthy eating in schoolchildren were classified as: self-administered structured questionnaire;^{16,23} intervention program of physical activity and / or nutrition;^{14-5,17-30} communication/education component "type booklets, text messages, printed educational materials";^{14-5,18-9,21-4,29-30} Site;^{21,23} motivational training;^{17,19-21,23-30} telephone;²² posters;^{22,25} serial album;²⁶ participation of teachers, students, parents and caregivers;^{13,20,26} mail⁽²⁷⁾; fruits and vegetables and tasting;^{18,24,29} equipment, sports;²⁹ rest;²⁹ leisure;²⁹ video;^{13,19} DVD;¹³⁻⁴ music;¹³ digital photography^{13,19} and validated questionnaires.^{19,21}

Approached category	Healthy Eating Practices
Article / Database and year of publication	<u>Motivational theater to increase consumption of vegetable dishes by preschool children.</u> PUBMED/ MEDLINE, 2017.
Objectives	Demonstrate the impact of an innovative approach to increase vegetable consumption by pre-school children and evaluate the viability and effectiveness of the intervention.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of Evidence - II
Technology Resources / Technology Classification	Intervention group: Teacher / parent. Features: DVD video puppets, music, dolls, digital photography, booklet corresponding to each DVD. Technology Classification: Light, yeast and hard.
Results	The use of theory-based motivational theater with multiple exposures and related activities can be an effective intervention to increase vegetable consumption by children and can be easily disseminated to a large sample.
Article / Database and year of publication	An innovative school-based intervention to promote healthy lifestyles. CINAHL, 2017.
Objectives	Evaluate the effectiveness of an educational program at school to improve children's eating habits.
Kind of study/ Level of Evidence	Intervention study. Level of Evidence - III
Technology Resources / Technology Classification	Educational Intervention, Resources: Instrument validated "Kidmed test" and books. Classification of light technology and yeasts.
Results	Increase in children's adherence to the Mediterranean diet, healthy changes in habits, greater adherence to physical activity, greater awareness of parents' educational responsibilities regarding their children's food choices. A new school / family alliance as a result of the educational intervention.
Article / Database and year of publication	Influence of Screen-Based Peer Modeling on Preschool Children's Vegetable Consumption and Preferences. PUBMED / MEDLINE, 2016.
Objectives	Verify the effectiveness of screen-based peer modeling in relation to pre-school vegetable preference, selection, and consumption.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of Evidence II
Technology Resources / Technology Classification	DVD of peers who consume a patterned vegetable (chili) vs. a non-food DVD segment versus no DVDs. Technology classification: Light, yeast and hard.
Results	The strategy to change behavior has been proven to be effective, increases children's vegetable consumption in preschool environments, low-cost, minimally invasive, and as a tool to be used in obesity prevention programs.
Article / Database and year of publication	The feasibility of implementing food-based dietary guidelines in the South African primary-school curriculum. WEB OF SCIENCE, 2015.
Objectives	To analyze educators' perceptions regarding the possibility of implementing dietary guidelines based on dietary foods (FBDG) * in the national primary school curriculum. * Food-based dietary guidelines'
Kind of study/ Level of Evidence	Descriptive cross - sectional quantitative study. Level of evidence-VI
Technology Resources / Technology Classification	Structured self-administered questionnaire. Technology classification: Light and yeast.
Results	The FBDG implementation in the national school curriculum is viable and of importance as a tool of nutritional education and optimization of the physical environment of the school through the concept of health promoting school.
Article / Database and year of publication	Promoting healthful diet and physical activity in the Mexican school system for the prevention of obesity in children. PUBMED / MEDLINE; SCOPUS 2013.
Objectives	To promote change in politics, aiming to obtain in the elementary Mexican public schools an environment that promotes in children healthy eating practices and physical activity.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence -II
Technology Resources / Technology Classification	Physical activity and nutrition intervention program, as well as a communication / education component. Technology classification: Light and yeast.
Results	Behavior change: increase physical activity, reduce caloric intake and adopt a healthier diet during the school hours of children in public schools in Mexico City by modifying the school environment and a communication strategy.

Approached category	Prevention of overweight and obesity
Article / Database and year of publication	Effects of the Educational Intervention on Some Health Belief Model Constructs on the Prevention of Obesity in Students. SCORPUS, 2016.
Objectives	Preventing overweight and obesity among adolescents.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence - II
Technology Resources / Technology Classification	Educational intervention performed by nutritionist and sports coach, use of healthy foods and use of validated questionnaire. Technology classification: Light and yeast.
Results	Before the intervention, there was no significant difference between the two groups in the mean scores of knowledge, perceived benefits and barriers, physical activity and nutritional behavior; but after the intervention, this difference between the two groups was significant.
Article / Database and year of publication	Promotion of healthy lifestyles in the family environment. SCORPUS, 2017.
Objectives	Elaborate a project of Health Education with a view to the promotion of eating habits and physical activity focused on the health of the family environment.
Kind of study/ Level of Evidence	Intervention study. Level of evidence - III
Technology Resources / Technology Classification	Participatory methodologies performed by four nurses, exercises to be performed at home, photos and video. Technology classification: Light, yeast and hard.
Results	Good results were obtained from adequate motivation, personal skills and self-esteem necessary for the adoption of measures aimed at health promotion, as well as one of the main strategies to be used to obtain self-care of persons aiming at personal and social competence with a view to promoting health.
Article / Database and year of publication	Primary prevention of overweight in preschool children, the BeeBOFT study (breastfeeding, breakfast daily, outside playing, few sweet drinks, less TV viewing): design of a cluster randomized controlled trial. PUBMED / MEDLINE, 2013.
Objectives	To evaluate the effects of two interventions to prevent overweight in relation to the health behaviors adopted and the Children's Body Mass Index.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence -II
Technology Resources / Technology Classification	'BBOFT + intervention (effective parenting of the child from birth, in relation to healthy behavioral habits and lifestyle). Intervention of the "E-health4Uth (provides health education tailored to parents the child of 18 and 24 months of age.) E-health website online (provides health education tailored to nutrition and activity and healthy child behaviors) Technology classification: Light and yeast.
Results	Parents' attitudes and other cognitive characteristics about their child's overweight-related behaviors were more favorable in both intervention groups compared to the condition of the control group.
Article / Database and year of publication	Healthy Habits, Happy Homes: methods and baseline data of a randomized controlled trial to improve household routines for obesity prevention. PUBMED / MEDLINE, SCOPUS, CINAHL, COCHRANE, 2012.
Objectives	Develop and test an intervention designed to promote the adoption of domestic routines by parents as preventive strategies for overweight and obesity.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence -II
Technology Resources / Technology Classification	Motivational training, telephone, educational materials and weekly text messages. Technology classification: Light, yeast and hard.
Results	The adoption of family routines related to family meals, sleep and screen time control, has been shown to be effective in promoting health and preventing overweight / obesity in children.
Approached category	Food and nutrition security
Article / Database and year of publication	Delphi method to get consensus about education methodologies in healthy eating for third to fifth school-age children, their parents and teachers. SCORPUS, 2016.
Objectives	Elaborate educational materials on healthy eating, aiming to change the current poor eating habits, which contribute to the increasing problem of childhood obesity.
Kind of study/ Level of Evidence	Methodological validation research with 54 judges. Level of evidence - VI
Technology Resources / Technology Classification	The application of the Delphi method for teachers, school children and their families. Questionnaires, internet, educational materials, audiovisuals, privileging participatory activities (cooking workshops, games, activities) on passive (information in parent meetings, delivery of educational material and expert conferences). Technology classification: Light, yeast and hard.
Results	The educational materials were validated by judges and by the target population itself, thus contributing to the final preparation of educational materials on healthy

	eating to be used in pre-basic and basic students, their parents and teachers, with a view to changing bad habits current diet, which contribute to the increase and worsening of the problem of childhood obesity in Chile and Latin America.
Article / Database and year of publication	The feasibility of implementing food-based dietary guidelines in the South African primary-school curriculum. Web of Science, 2015.
Objectives	
Kind of study/ Level of Evidence	Evaluate educators 'perceptions of students' eating habits and physical activity, and identify obstacles that impede the implementation of guidelines within the school curriculum.
Technology Resources / Technology Classification	Cross - sectional and descriptive study using quantitative and qualitative methodologies. Level of evidence - V
Results	Several intervention strategies can be developed and implemented in schools for the insertion of food-based dietary guidelines - FBDG. These guidelines offer the possibility of successful implementation of the FBDG, not only in terms of curriculum, but also through the School Health Integrated Policy in South Africa. Self-administered structured questionnaire, FBDG leaflets from the Department of Health were released to educators. Technology classification: Light and yeast.
Article / Database and year of publication	Veggiecation: A Novel Approach to Improve Vegetable Consumption Among School-Aged Children. PUBMED/ MEDLINE, SCOPUS, 2013.
Objectives	Design an effective program to improve vegetable consumption among children.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence -II
Technology Resources / Technology Classification	Veggiecation is a nutrition education program, posters (Figure), nutritional education in classrooms, tasting of horticultural products in cafeterias. Technology rating: Lightweight and lightweight.
Results	Positive attitude influencing the intake of vegetables in the school program.
Article / Database and year of publication	Food safety and the use of regional foods: the validation of a serial album. PUBMED / MEDLINE, SCOPUS, 2012.
Objectives	Validate the content and appearance of the album.
Kind of study/ Level of Evidence	Methodological research, carried out with twelve judges Level of evidence - VI
Technology Resources / Technology Classification	Serial album, child care consultation. Technology rating: Lightweight and lightweight.
Results	The serial album constitutes an educational tool validated to be used by the nursing professional during the consultation of child care to promote child health.
Article / Database and year of publication	[BEO'S-physical activity and healthy eating at schools in Oberfranken, Bavaria concept and first results of a resource-oriented, systemic approach in school-based health promotion]. PUBMED / MEDLINE, SCOPUS, 2012.
Objectives	Present the concept of an initiative called "BEO'S" Physical Activity and Healthy Eating in Schools in Oberfranken, Bavaria ", and check the acceptance and implementation of this program in participating schools.
Kind of study/ Level of Evidence	Intervention study. Level of evidence - III
Technology Resources / Technology Classification	BEO'S systemwide approach that includes the entire school and is tailored to the school's existing resources. Participation of teachers, students, parents and caregivers, promoting motivation and training in the school environment. Technology rating: Lightweight and lightweight.
Results	BEO'S has a high acceptance by all parties involved. However, implementation gaps still exist, with regard to the participation of all stakeholders.
Article / Database and year of publication	Intervention Based Exclusively on Stage-Matched Printed Educational Materials Regarding Healthy Eating Does Not Result in Changes to Adolescents' Dietary Behavior. SCOPUS, 2012.
Objectives	To evaluate the impact of an intervention through the use of printed educational materials, in order to obtain a greater intake of fruits and vegetables, as well as, in relation to the balance of decisions regarding the perceived benefits and barriers and self-efficacy among adolescents in public schools in Brasilia, Federal District, Brazil.
Kind of study/ Level of Evidence	
Technology Resources / Technology Classification	Controlled and randomized intervention study. Level of evidence -II
Results	Distribution of educational materials as an exclusive measure for nutritional intervention did not present satisfactory results in the change in the eating habits of adolescents. These nutritional interventions should include other strategies to motivate them to adopt a healthy diet beyond the distribution of printed educational materials.

Article / Database and year of publication	Teaching Healthful Food Choices to Elementary School Students and Their Parents: The Nutrition Detectives™ Program*. PUBMED/MEDLINE, SCOPUS, CINAHL, COCHRANE, 2011.
Objectives	Evaluate the effects of a nutritional education program "Detectives" aimed at guiding elementary school students and their parents to recognize and choose healthier foods by considering the various categories of food.
Kind of study/ Level of Evidence	Controlled and randomized intervention study. Level of evidence -II
Technology Resources / Technology Classification	Nutrition program "Detectives". Nutritional guidance to parents through written materials and meetings. Technology rating: Lightweight and lightweight.
Results	The Nutrition Program "Detectives" favored students and their parents to identify properly and to choose the most nutritious foods.
Article / Database and year of publication	Changes in adolescents' intake of sugar-sweetened beverages and sedentary behaviors: results at 8 months mid-way assessment of the HEIA study-a comprehensive, multi-component school-based randomized trial. PUBMED / MEDLINE, 2011.
Objectives	Evaluate the effect of a "Heia" intervention program, including tokens for parents and classroom components, on the consumption of sugar-sweetened beverages (SSB) and screen time (TV, DVD and computer / games). And to verify if the potential effects of the parents' involvement varied in relation to the sex of the adolescents, weight status (WS) and if there was a change in the level of education of the parents.
Kind of study/ Level of Evidence	Controlled and randomized study. Level of evidence -II
Technology Resources / Technology Classification	"Heia" intervention program; Lessons for students, booklet, posters, fruits and vegetables weekly, rest period, leisure. Equipment, sports and a place of coexistence. Technology classification: Lightweight, light-hard and hard.
Results	This study suggests that exploring the potential beneficial or negative effects of subgroup intervention is important, since in this study it was possible to see that there were only behavioral changes in girls. It is necessary to include issues related to gender, weight status and parental involvement in order to increase the effectiveness of preventive initiatives.

Figure 3. Synthesis of publications on educational interventions used to promote healthy eating in schoolchildren. Recife (PE), Brazil, 2018.

DISCUSSION

The educational interventions used to promote healthy eating in schoolchildren shown in the articles were presented, which were: structured self-administered questionnaires; educational materials; posters; serial album; mail; nutritional counseling; booklet; posters; sports equipment; video; DVD; music; digital photography; validated questionnaires; information sheets; systematic meetings with parents; degustation of food products, fruits and vegetables; participation of the entire school community; motivational training; telephone and use of four intervention programs (BBOFT +, E-health4Uth, Nutrition Program Detectives™, Heia Intervention Program) and Site Child E-health4Uth). Thus, it can be observed that there are different ways and means to carry out educational interventions, ranging from the simplest to the most sophisticated, individually or collectively.

It is known, in relation to the types of technologies used in the articles analyzed, that light and light-hard technologies were observed¹⁴⁻³⁰ and hard.^{14,16,20,22,23,30} Light technologies are characterized by the use of structured knowledge and were evidenced by educational interventions such as nutritional

orientation, food products tasting, systematic meetings with parents and motivational training, as well as music. And in relation to light-hard technologies, characterized by the use of technological resources and interpersonal relations, constituting the communication process and observing the use of educational materials: serial album, booklet, posters, posters, digital photography, booklets, information sheets and mail. The hard technologies, characterized by the use of equipment, were the use of telephone, video, DVD, computers, Child E-health4Uth website and four programs of nutritional interventions - BeeBOFT study and "E-health4Uth; [BEO'S-physical activity and healthy eating at schools; The Nutrition Detectives™ Program; the HEIA study.^{21,27,29-30} During the educational process, in addition to the involvement of the educator and the learner, the use of educational technologies plays a fundamental role, regardless of the type of the technology used, whether it is light, hard or hard, or the use of more than one of them.

For the articles classified in the category of healthy food practices, the need was for changes in the school curriculum with the implementation of dietary foods and changes in the policy aimed at making the school environment conducive to health promotion. Based on the importance of the school

environment for health promotion, it is necessary to review the school curriculum in order to implement healthy eating practices and the possibility of working these contents in a transdisciplinary way involving the entire school community.¹⁴⁻⁸ Similar studies were carried out aiming at the acquisition of these objectives, such as a paper that approached the experience report of an extension project in Permanent Education in the format of Food and Health Education - OPEAS workshops on nutritional education involving the educators, nutritionists responsible for school feeding, and Nutrition undergraduates, held at the Baixada Santista campus, together with the Pro-Rector of Extension of the Federal University of São Paulo.³¹ In another, a study was carried out in two schools in the municipality of Florianópolis (SC) where, in its results, it was possible to prove the nutritional education program aiming at the prevention of obesity and improvements in the food consumption profile of elementary school students.³²

In the articles categorized as prevention of overweight and obesity, the parents' attitudes directly influenced the behaviors related to the excess weight of their children, being also highlighted the need to have modifications in the routines of the families, with stimulus for the accomplishment of the meals in family, control of the sleep and the time of screen, aiming at the improvement of the nutritional condition. This shows the fundamental role that the family plays in the formation of healthy living habits and, among them, eating habits, which allows us to emphasize the important role that parents play in the formation of their children.¹⁹⁻²² A study was also carried out with 29 children aged between seven and nine years old (mother, father and grandmother) enrolled in the second grade of elementary school of a public school in the outskirts of a city in the Brazilian Northeast, which aimed to investigate the understanding that these caregivers had regarding the influence exerted by television on children's eating habits.³³ In another study carried out with eighth-year students from a state college in Boa Vista da Aparecida / PR, the objective was to investigate the influence of the media on the food choices and preferences of these students, and to verify the possibility of constructing a more critical view of these students in relation to this influence through the performance of a work of intervention.³⁴

In the articles related to the Food and Nutrition Security category, we observed several educational interventions aimed at encouraging healthy eating among

schoolchildren, where it was possible to highlight the encouragement of vegetable consumption among schoolchildren, validation of content and the appearance of a serial album to be used by the health professionals for the practice of nutritional education, changes in the school environment, with the improvement in the behavior of nutrition and the practice of physical activity among the students as a consequence of the implementation and acceptance of the program.²³⁻³⁰ Another review study of the literature aimed to analyze the effectiveness of the actions of health-directed intervention programs carried out in Brazilian schools, that these intervention programs are managing to reduce the sedentary lifestyle and integrating health education actions, and that the programs to support family health, greater participation of physical education teachers is necessary.³⁵

The impact of intervention based on dramatization and the use of printed educational materials that aimed to encourage a greater intake of fruits and vegetables with a positive balance in relation to the self-efficacy in relation to the decisions regarding these benefits was verified. A study was also conducted with adolescents of both sexes, aged 11 to 13 years, enrolled in the sixth year of a school in the municipal network of Montes Claros, MG, where Nutrition scholars report their experiences in the perspective of nutritional education carried out with adolescents to promote the consumption of fruits and vegetables.³⁶ Another study with adolescents assisted by two social projects selected for convenience in the municipality of Chapecó, Santa Catarina, had the purpose of evaluating the eating behavior for fruits and vegetables of these adolescents, who live in conditions of social vulnerability, considering the quantitative aspects of consumption and the subjective aspects related to food perception and attitudes towards these foods.³⁷

The effects of a nutritional education program aimed at teaching elementary school students and their parents to distinguish between healthier and less healthy choices in the various food categories were verified. A study was also carried out to analyze the advertising of food directed at children, published in two television channels, identifying their arguments in comparison to the Anvisa Technical Regulation.³⁸

Finally, the effect of an intervention program with the use of fiches for the parents and the discussion in the classroom regarding the consumption of sugar-sweetened

beverages, screen time and the nutritional condition presented by the parents were evaluated by the students.

In relation to these factors, a cross-sectional study with a school-based national scope was carried out, with adolescents between 12 and 17 years of age attending schools in Brazilian cities with more than 100 thousand inhabitants during the period of 2013 and 2014. This study aimed to estimate the prevalence of diabetes mellitus, obesity, cardiovascular risk factors and insulin resistance and inflammatory markers, and the Study of Cardiovascular Risks in Adolescents (SCRA). In it, there was a part devoted to collecting food information, as well as addressing the hours of computer, TV and video game use on a typical weekday whose purpose was to describe the time of exposure to the screens and the prevalence of consumption of meals and snacks in front of screens in Brazilian adolescents. It has been found that the screens have occupied a prominent place in the family, leading to profound changes in the lifestyle of the population, where the traditional habits of family gatherings around the meals are being replaced by modern habits of eating in front to screens. This practice, for the most part, causes people to pay no attention to what they are consuming, as well as failing to perform chewing properly and properly.³⁹

It is therefore inferred, for the effectiveness of educational interventions to encourage healthy eating practices among schoolchildren to occur, which requires the involvement of the whole school community and the effective participation of parents or guardians in this process.

CONCLUSION

It is concluded, through this study, that for the implementation of educational interventions, aimed at promoting healthy eating in schoolchildren, several resources can be used, from simple to sophisticated. Its effectiveness will be based on the involvement of the entire school community and the effective participation of parents or guardians in this process.

The school environment is considered a place of great importance for the promotion of health. Given this, it is necessary that the school curriculum be reviewed and that there is the possibility of implementing themes related to healthy eating worked in a transdisciplinary way and that healthy eating practices involving the whole school community.

New research on health promotion in the school environment, in the various social contexts, should be carried out in view of the relevance of the theme studied for the healthy growth and development of schoolchildren, with emphasis on the formation of their eating habits, which will reflect throughout the life of these individuals from the prevention and control of chronic degenerative diseases.

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