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Food and nutrition education interventions and their application in health communication: a systematic review.

Food and nutrition education interventions and application in health communication: a systematic review.

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Summary: Health education and communication are fundamental action strategies for improving the nutritional conditions of communities. Various health communication models are applied in Food and Nutrition Education (FNE) interventions to build the teaching-learning process, but evidence on which prevails is still scarce. The purpose of this study is to analyze the available scientific literature on FNE interventions carried out in Latin America, characterizing the different health communication models. Forty-five FNE interventions were evaluated, obtained from Google Scholar, SciELO, and Scopus. The following keywords were used: Nutrition Sciences, Communication, Interventions in/of Food and Nutrition Education, Food and Nutrition Education, Communication in/for Health, and Media. The review was conducted according to PRISMA guidelines. As a result, an absence of participatory workshops (53.3%), community participation (64.4%) and democratic participation (68.9%), facilitating educator role (62.2%), dialogic communication (64.4%), inclusion of popular knowledge of the community (75.6%) and inclusion of the analysis of the communicational community environment (84.4%) was observed. The presence of translation of scientific technical language (95.6%), persuasive talks (66.7%), changes in attitude in students (97.8%), behaviorist educator role (73.3%) and one-way communication (68.9%) was evident. It was possible to conclude that EAN interventions are governed by behaviorist models and non-participatory models of health communication, evidencing a need for education based on constructivist models.

Keywords: Food and Nutrition Education, Educational Assessment, Health Communication

Abstract: Education and communication for health are fundamental action strategies for improving the communities' nutritional conditions. Several health communication models are applied in Food and Nutrition Education (FNE) interventions to build upon the teaching-learning process, but the evidence on which one predominates is still scarce. This work aims to analyze the available scientific literature on FNE interventions in Ibero-America, characterizing the different health communication models. 45 FNE interventions obtained from Google Scholar, SciELO , and Scopus were evaluated. The following keywords were identified: Nutrition Sciences, Communication, Food and Nutrition Education Interventions, Food and Nutrition Education, Communication in/for health , and Media. The review was conducted following PRISMA guidelines. As a result, the absence of participatory workshops (53.3%), community (64.4%) and democratic participation (68.9%), facilitator educator role (62.2%), dialogic communication (64.4%), inclusion of popular knowledge of the community (75.6%) and Inclusion of a communicative community environment

analysis (84.4%) were observed. There was evidence of the presence of translation of scientific technical language (95.6%), persuasive talks (66.7%), changes in learners' attitudes (97.8%), behavioral educator role (73.3%) , and unidirectional communication (68.9%). The work has concluded that FNE interventions are governed by behavioral models and non-participatory models of health communication, evidencing a need for education based on constructivist models.

Keywords: Food and Nutrition Education, Educational Evaluation, Health Communication

1. Introduction

Education is considered a key right that enhances personal development and is fundamental to the enjoyment of other rights (1). The 1948 Universal Declaration of Human Rights (UDHR) and the Sustainable Development Goals (SDGs) underline the importance of equitable, inclusive, and quality education (2). In this context, it is crucial to consider the interrelationship between the right to education and the right to food at all stages of life. Specifically, the Declaration of the Rights of the Child explicitly states the right of children and families to receive appropriate information on nutrition and food to promote physical health and well-being, given the importance of quality nutrition during critical periods of growth and development. Furthermore, it includes access to food education to combat malnutrition and ensure that parents and caregivers have appropriate access to it (3). This responds to a food situation where diets are migrating from the consumption of real foods to a predominance of processed foods and ultra-processed products. In this framework, access to information is a tool for changing and maintaining healthy habits for both individuals and populations (4).

In Argentina, the National Education Law (No. 26,206) was passed on December 14, 2006. Its purpose is to regulate the exercise of the right to teach and learn, as enshrined in Article 14 of the National Constitution and the international treaties incorporated therein (5). Mentioning education leads to the conceptualization of the discipline of Communication in and for Health, which is conceived as a key strategy to inform, sensitize, raise awareness, and build opinions in and with the population regarding aspects concerning health. This discipline can be used to rethink and question the current state of compliance with the aforementioned rights, since it covers several areas including education, health journalism, interpersonal communication, among others (6).

Within the field of education, Food and Nutrition Education (FNE) is defined (in one of its many forms) as the set of communication activities that aim to voluntarily modify those eating practices that influence the nutritional status of people with the objective of improving it (7). Education, together with health communication, constitute fundamental action strategies for achieving the improvement of the nutritional conditions of communities, through complex interactions that occur in communication processes with participation as a key component. There are various models/theories of health communication that are applied to the generation and production of educational interventions in food and nutrition for the construction of the teaching-learning process (8). Thus, the objective of this work is to analyze the available scientific literature on FNE interventions carried out in Latin America, characterizing the different models of health communication.

2. Methods

Methodological design

An exploratory/descriptive Systematic Review (SR) was conducted, incorporating various study designs, interventions and impact measures.

Inclusion and Exclusion Criteria

We included EAN interventions published from 2000 onward, in English, Spanish, and Portuguese, with a geographic scope focused on Latin America. They were selected using inclusion criteria such as design type (educational interventions in EAN), and open and free access. The sample consisted of articles selected after applying filters, excluding those that did not meet the research objectives, were not open access, had insufficient methodology development according to expert criteria (i.e., those that did not clearly describe the intervention design, lacked outcome indicators, or did not explain the evaluation methods), or did not correspond to the established geographic location. To assess this geographic coverage, we considered the locations of the authors' affiliation institutions (unless the study location was explicitly mentioned).

Data collection techniques and instruments

The review was conducted in multiple sequential stages, organized by independent subgroups. In the first phase, a literature search was conducted in Google Scholar, SciELO, and Scopus, focusing on health communication and interventions in EAN, based on the search strings. To target the search toward the review objectives, the following keywords from the Descriptors in Health Sciences (DeCS) were used: Nutrition Sciences, Communication, Interventions in/of Food and Nutrition Education, Food and Nutrition Education, Communication in/for Health, and Media. The search strings were constructed by exhausting the combination of the descriptors used and the Boolean operators AND and OR. They were also adapted to the corresponding language (Spanish, English, or Portuguese) and systematically applied to the aforementioned search engines to maximize search sensitivity without compromising specificity. The search strings can be found in Appendix 4.

Subsequently, a first round of selection was carried out based on the title and abstract of the retrieved articles, prioritizing those with open access full text. Following this, a thorough critical reading of the selected studies was conducted to assess their thematic and methodological relevance. The review process was conducted by independent teams in three successive rounds: the first full review was conducted by VF; subsequently, FR and MNC replicated the procedure independently. Finally, a consolidated review was conducted by a committee of communication experts for the EAN (RB, RD, and CMS) to ensure the coherence, comprehensiveness, and consistency of the final corpus included in the analysis. This process is detailed in a flowchart (Figure 1).

Methodological quality was assessed by systematically applying the Downs and Black model and the STROBE guidelines to all studies, depending on the type of study (experimental or observational, respectively). The application of the first model allows for the analysis of the internal and external validity of experimental studies in the health field, whether randomized or not. The authors propose a scoring scale corresponding to: 20 to 31 points for high quality, 10 to 19 points for intermediate quality, and less than 10 points for low quality, depending on the presence or absence of the guideline attributes (9). The results of this complete evaluation are found in Annex 1. The STROBE (STRengthening the Reporting of Observational studies in Epidemiology) guidelines were also used to assess the quality of the selected observational studies (10). Annex 2 shows the evaluations and final scores of the evaluated articles. It should be noted that for both evaluations, the methodology reported for searching for papers and reviews was followed, where the methodological evaluation was carried out in the independent subgroups mentioned above.

This review was conducted following the recommendations and guidelines of the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) 2020 statement (11).

Data analysis

The data obtained were analyzed using analytical matrices, breaking down each intervention according to: title, year of publication, link, methods, measured variables, database, objectives, country, language, results, conclusions, and type of design. The analysis was represented in tables and flowcharts that include included and excluded documents, quantifying them. A treatment plan was proposed that includes findings, a summary of results, conclusions, and recommendations according to the objectives and the information collected. The objective of this plan was to seek evidence of the types of health communication models used in the interventions. In particular, the study focused on five types of complementary and comprehensive models, which were proposed in the Gamboa-Delgado et al. (2018) model, namely: 1- the health beliefs model, 2- the participatory health communication model, 3- the persuasive communication model, 4- the educational communication model, and 5- communication for social change / dialogic communication. Each of these models gave rise to a study variable on which a set of indicators was defined that allow the interventions to be characterized from different communication approaches.

3. Results

Selection Process and Characteristics of the Articles

In the initial review phase, 222 relevant articles were identified based on relevance criteria by title and abstract, distributed in the indexed databases of Google Scholar (167), SciELO (23), and Scopus (32). The initial evaluation led to the application of specific exclusion criteria to ensure the relevance and quality of the studies. This included the elimination of 65 articles for not corresponding to the desired study design, 62 for insufficient methodological development that prevented an adequate comparison of the variables of interest, 19 for lack of free access to the full text, and 27 for duplication. Additionally, 4 articles were excluded because they did not fit the specific geographical delimitation of Ibero-America. This filtering process resulted in a final corpus of 45 articles suitable for analysis in the SR. A list of these articles is included in Annex 3.

Design and Quality of the Interventions Evaluated

The study designs addressed in the final articles were varied, including quasi-experimental approaches, studies with and without control groups, longitudinal and cross-sectional designs, descriptive studies, community-controlled trials, and qualitative studies. Some studies implemented NSE interventions with pre- and posttest measurements. Quality assessment, based on the Downs & Black checklist, revealed that 4.4% of the interventions were classified as high quality, 84.4% as intermediate quality, and 11.1% as low quality. The STROBE guidelines criteria for observational studies indicated that case-control and cross-sectional designs predominated, with a notable absence of cohort studies.

Diversity of Designs and Countries of Intervention

The interventions analyzed cover a wide range of designs, including quasi-experimental, longitudinal, and cross-sectional studies, as well as qualitative methodologies. These studies were conducted in a variety of Ibero-American contexts, including Spain, Panama, Chile, Peru, Argentina, Cuba, Brazil, Colombia, Paraguay, Mexico, and Portugal. This variety reflects the richness of approaches in NEAN and underscores the importance of adapting interventions to specific cultural contexts.

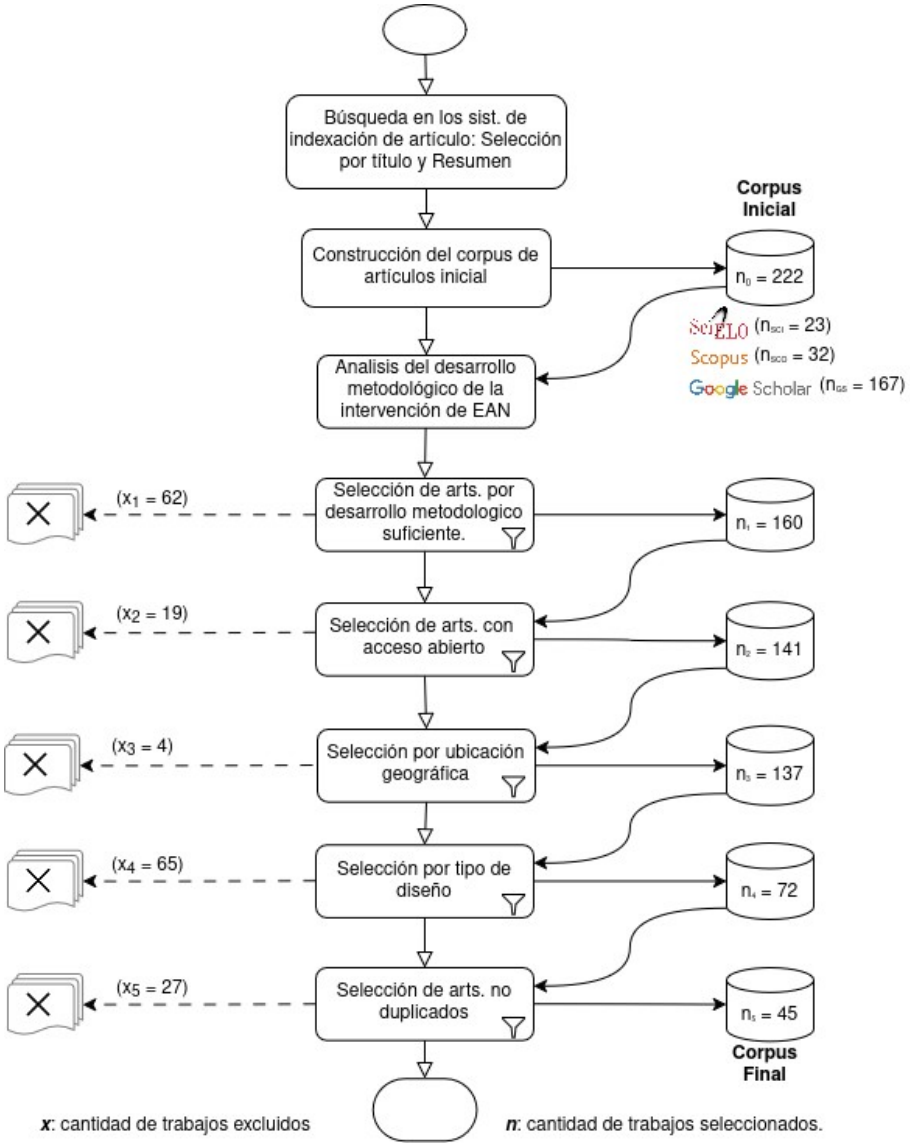

Figure 1. Corpus construction process for the systematic review of EAN interventions.

Indicators

Table 1 details the quantitative results of the indicator measurements for the interventions. These indicators have been interpreted in the context of each intervention, resulting in a characterization of the strengths and weaknesses of the EAN initiatives in Latin America. Below is a reflection on this characterization by study variable, highlighting the results of some relevant indicators:

- **Variable** : *Health Beliefs (HB)*
  - **Indicator** : *Activities that investigate beliefs/perceptions about health and/or nutrition* .

  The 33.3% of interventions addressing beliefs and perceptions about health and nutrition emphasized the importance of understanding the cultural and social framework within which individuals make dietary decisions. This proportion reflects a critical need to incorporate qualitative assessments that capture the complexity of eating attitudes, beliefs, and practices. Specific examples included exploring cultural perceptions about specific foods and identifying myths and deeply held beliefs that influence eating practices.

Expanding this approach could significantly improve the relevance and effectiveness of EAN interventions, allowing them to be more personalized and culturally sensitive.

- **Variable:** *Participatory Health Communication (PHC)*
  - **Indicator:** *Democratic Participation*

  Democratic participation (considered as explicit mechanisms that enabled shared decision-making), observed in 31.1% of interventions, highlights the importance of involving communities in the decision-making process. Although some studies demonstrated success in including community voices through discussion forums and co-creation workshops, there is still considerable room to expand these practices. Increasing democratic participation not only empowers communities but also ensures that interventions are more relevant and tailored to the specific needs of the target population.
  - **Indicator:** *Participatory Workshops*

  The implementation of participatory workshops in 46.7% of interventions underscores a move toward more interactive and participant-centered approaches to food education. These workshops ranged from practical cooking sessions to group discussions on healthy eating habits, demonstrating a wide range of methods for actively engaging participants. Despite these efforts, the analysis suggests a need to further strengthen the participatory nature of these sessions, better integrating participants' prior experiences and knowledge to foster meaningful and sustained learning.
  - **Indicator:** *Community Participation at All Stages*

  Community involvement in all stages of the intervention (from assessment to final evaluation) was limited, with only 35.6% of interventions reporting full community participation. This finding indicates an area of opportunity to improve collaboration with communities from problem identification to impact evaluation. Community participation not only improves the acceptance and relevance of interventions but also contributes to the sustainability of dietary behavior changes by fostering community ownership and commitment.
- **Variable:** *Educational Communication (CE)*

  The prevalence of one-way communication in 68.9% of interventions indicates a tendency toward traditional teaching methods. However, communication as dialogue, present in 35.7% of cases, highlights the importance of adopting communication strategies that promote two-way knowledge exchange. These strategies can range from interactive sessions to the use of social media and digital platforms to encourage greater interaction and participation among EAN recipients.
- **Variable:** *Communication for Social Change/Dialogic (CCS)*
  - **Indicator:** *Inclusion of Popular Knowledge and Environmental Analysis*

  The integration of popular knowledge in 24.4% of interventions and the analysis of the community communication environment in 15.6% demonstrate an effort to contextualize EAN within local realities. Despite these efforts, there is clear scope for greater inclusion of traditional knowledge and a deeper analysis of the communication environment to optimize delivery strategies and increase the resonance of interventions with their audiences. Adopting a more holistic approach that considers the sociocultural and communication environment of communities can significantly improve the effectiveness of EAN interventions.

Table 1. Quantitative results of the indicators measured in the interventions .

Variable	Indicator	Presence %(n)	Absence %(n)
Health beliefs	**CS.1** Activities that investigate beliefs/perceptions about health and/or nutrition	33.3 (15)	66.7 (30)
Participatory communication in health	**CPS.1** Democratic Participation	31.1 (14)	68.9(31)
	CPS.2 Participatory workshops	46.7 (21)	53.3 (24)
	CPS.3 Community participation in all stages of the intervention	35.6 (16)	64.4 (29)
	CPS.4 Translation of technical scientific language	95.6 (43)	4.4 (2)
Persuasive communication	**CP.1** Persuasive informative talks, of a one-way communicative nature towards the students	66.7 (30)	33.3 (15)
	CP.2 Change in attitude of students at the end of the intervention	97.8 (44)	2.2 (1)
Educational communication	**CE.1** Role of behavioral educator	73.3 (33)	26.7 (12)
	CE.2 Educator facilitator role	37.8 (17)	62.2 (28)
	CE.3 One-way communication	68.9 (31)	31.1 (14)
	CE.4 Communication as dialogue	63.6 (16)	64.4 (29)
Communication for social change / dialogic	**CCS.1** Inclusion of popular knowledge of the educational community in the contents worked on during the intervention	24.4 (11)	75.6 (34)
	CCS.2 Community involvement in the various forms of communication carried out	46.7 (21)	53.3 (24)
	CCS.3 Inclusion of analysis of the communication community environment	15.6 (7)	84.4 (38)

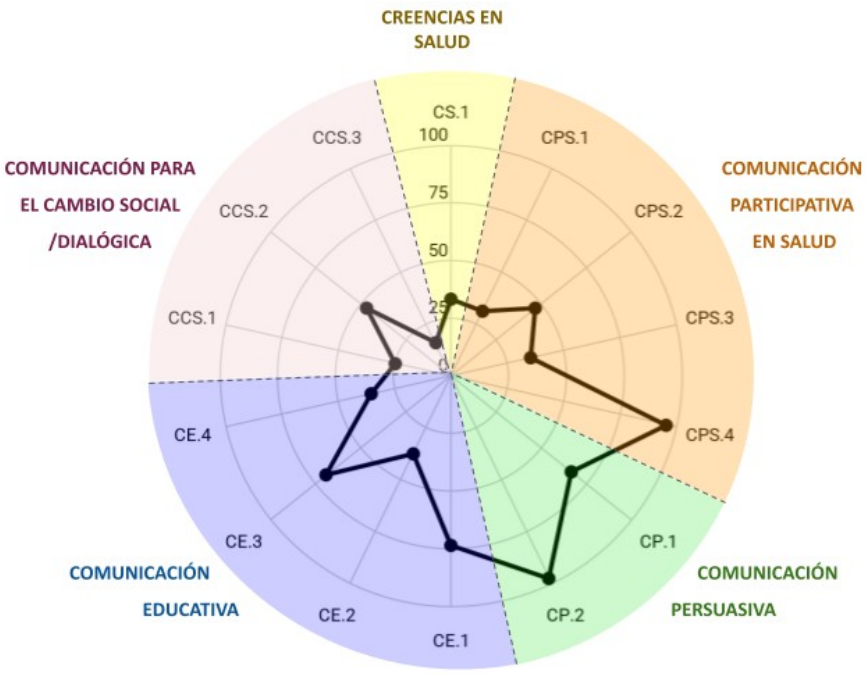

Figure 2. Indicators measured in the interventions: presence of communication models in EAN by variable analyzed .

This detailed analysis by indicator reveals the complexity and challenges inherent in implementing NSE interventions in Ibero-America. Figure 2 summarizes the measurements taken and allows for an analysis of the study variables where the indicators showed the greatest strengths and weaknesses. In particular, no *Health Belief* or *Dialogic/Social Change Communication indicator* showed values above 50%, while those corresponding to *Persuasive Communication* exceeded 66% in all cases. Furthermore, the results demonstrate an effort to adopt participatory and culturally relevant approaches, while highlighting key areas for improvement. These include the need for greater community inclusion, more interactive communication approaches, and a deeper integration of local knowledge and contextual analysis in the planning and implementation of interventions. By expanding these areas, NSE interventions can achieve a deeper and more sustainable impact on promoting healthy eating habits.

4. Discussion

This research highlights the prevalence of behaviorist approaches in EAN interventions, as evidenced by the significant finding that more than 70% of the reviewed interventions are characterized by a behaviorist educational role (indicator CE.1). This trend, which aligns educational content with an indisputable and transmitting vision of scientific knowledge, reflects the observations of Alzate Yepes (12) on the persistence of traditional educational models and the centrality of the educator as an authority figure in the teaching process. Furthermore, the tendency towards non-participatory communication models in EAN interventions has been confirmed, despite evidence pointing to greater effectiveness of educational strategies that adopt a participatory approach. This review reveals a notable mismatch between theory and practice in the implementation of communication models that foster the active participation of a broader range of social actors, as suggested by the research of Gamboa Delgado (8).

In Ochoa's (13) research on the perception of healthy eating among primary school students, a predominance of behavioral approaches and the use of the traditional transmission-reception didactic model were highlighted. This approach treats scientific content as unquestionable truths taught in an encyclopedic and fragmented manner, relegating students to a passive role. This observation aligns with the findings of our review, where approximately 70% of the interventions

adopted one-way communication (CE.3), limiting the student to a receiving role with no room for dialogue.

Although less than 36% of the interventions explored two-way communication (CE.4), this approach is essential, as suggested by Restrepo Mesa (14), to transcend the mere transmission of information and foster an educational process based on dialogue and reflection. This methodology promotes awareness and education from the perspective and context of the learner, enhancing effectiveness and adherence to the educational process. Contrary to Restrepo Mesa's recommendations, most of the interventions reviewed resorted to one-way informative talks, evidencing a significant gap between theory and practice in EAN. Furthermore, the analysis revealed a notable absence of evaluation of the community communication environment in 84% of cases (CCS.3). This implies an omission of the evaluation of reference to the local dynamics of information circulation, informal communication networks, symbolic languages and most influential reference channels in a community; key elements in any communication model. Russo Córdoba (2013) (15) emphasizes that overcoming communication challenges requires a deep understanding of the target audience, their perceptions and the most effective communication techniques to capture their interest and promote meaningful learning.

The predominant methodology used in the interventions was the assessment of changes in attitude and knowledge (CP.2), present in 97% of the cases. However, this study does not investigate the effectiveness of these interventions in modifying eating behaviors, an area that, according to Oliva Rodriguez et al. (2013) (16), requires additional research to determine whether changes in knowledge and attitude translate into concrete improvements in eating habits.

A notable limitation of this study was the difficulty in finding systematic reviews with similar approaches and variables for comparing outcomes. This may be due to underreporting of educational interventions, which are mostly carried out in institutional settings (educational settings); as well as the possible academic underestimation of these types of practices; or a limited systematization of projects in community contexts, many of which fail to reach mainstream scientific circles or remain in the gray literature (not analyzed in this paper). However, this shortcoming also represents an opportunity to enrich the field of study with new research that delves deeper into these topics.

5. Conclusions

- The completion of this systematic review has provided a comprehensive and detailed overview of the current landscape of EAN interventions in Ibero-America, highlighting an opportunity to explore and leverage learners' preexisting beliefs and perceptions about health and nutrition. The inclusion of these perspectives could significantly enrich the educational process, making the content more relevant and resonant for participants.
- The limited implementation of participatory workshops and the limited democratic and community participation in the interventions examined suggest a critical need to rethink how these initiatives are designed and implemented. Fostering dialogue and active participation is not only essential for developing more tailored and culturally relevant messages and content, but also fundamental for empowering individuals regarding their health and nutritional well-being.
- Although the role of the behaviorist educator prevailed over that of the facilitator in the interventions reviewed, it is crucial to reconsider this approach to highlight the importance of two-way communication and learner autonomy. Facilitating an environment in which individuals can express themselves and actively participate in their learning is essential for a deeper and more lasting educational impact. Thus, this analysis highlights the need to rethink educational strategies in EAN, emphasizing the importance of dialogic and participatory methods that consider the context and learners' perceptions to facilitate more

effective learning. The dominance of one-way communication over dialogue in the interventions underscores the urgent need to center learners in the communicative process, promoting methods that allow for their active expression and participation in their own learning process.

- This study, by not delving into the specific results of each intervention, highlights a valuable opportunity to further explore the effectiveness of different educational methodologies in promoting healthy habits.
- The findings obtained in this review provide a solid foundation for future research in EAN, highlighting the importance of moving toward more interactive, participatory, and empowering approaches that can translate into meaningful and sustainable changes in eating and nutrition behaviors.

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Annex 1. Quality evaluation of articles using Downs & Black

CHECKLIST D&B / INTERVENCIONES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
HIP/OBJ CLARAMENTE DESCRIPTOS	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DESCRIBE COMO SE MIDEN RESULTADOS	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CARACT DE PARTICIP DESCRIPTAS	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
INTERV DE INTERES DESCRIPTAS	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PPALES CONFUNDIDORES DESCRIPTOS	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HALLAZGOS PPALES CLAR DESCRIPTOS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MED DE VARIAB DESCRIPTAS EN LOS RESULT.	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1
REPORTE DE EFECTOS ADVERSOS DE LA INTERV.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CARACT DE PARTICIP PERDIDOS	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
RESULT PPALES CON VALORES DE MED DE PROB.	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1
MUESTRA PROB. O NO PROBABILISTICA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MUESTRA REPRESENT DE LA POBL. DE ORIGEN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
INTERV. REPRESENT. P/ LA POBL. EN GRAL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PARTICIPANTES INTERV A CIEGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVESTIGADORES INTERV. A CIEGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPORTE DE RESULTADOS NO PLANIFICADOS	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IGUAL SEGUIM DE TODOS LOS PARTICIP	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TEST ESTADISTICOS ADECUADOS A LA MUESTRA	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
CONFIABILIDAD EN EL CUMPLIM DE LA INTERV	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PPALES RESULT CONFIABLES Y VALIDOS	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PARTICIPANTES PROVIENEN DE LA MISMA POBL.	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RECLUTAMIENTO EN EL MISMO PERIODO DE T.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ASIGNACION ALEATORIA DE SUJETOS DE LA INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0
INTERV. ALEATORIA A CIEGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANALISIS AJUSTADO X POTENCIALES CONFUND.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONSIDERA PERDIDAS DE SEGUIM DE PARTICIP.	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INTERVENCION DETECTA EFECTOS P<0.05	0	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1
TOTAL=	14	18	22	17	20	13	17	16	17	17	19	7	19	16	17	17	17	15	17	17	17	16	13	11	16	16	18	19	17	18	18	12	17	18	18	17	17	17	18	17	18	13	17	17	17
CALIDAD=	INT	INT	ALTA	INT	ALTA	INT	INT	INT	INT	INT	INT	BAJA	INT	INT	INT	INT	INT	INT	INT	INT	INT	INT	BAJA	BAJA	INT	INT	INT	INT	INT	INT	BAJA	INT	INT	INT	INT	INT	INT	INT	INT	INT	BAJA	INT	INT	INT

Annex 2. Quality assessment of articles using STROBE guidelines

CHECKLIST STROBE (1=Presencia/0=Ausencia/X=NO APLICA)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
TITULO Y RESUMEN																																														
1A- IDENTIFICA COMO COHORTE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1B- IDENTIFICA COMO CASO CONTROL	X	1	1	X	1	X	X	X	1	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	1	X	X	1	1	1	X	X	X	1	X	X	X	X
1C- IDENTIFICA COMO TRANSVERSAL	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	X	1	X	X	1	X	X	X	X	X	X	X	X	X
1D- RESUMEN COMO SINTESIS E INFORMATIVO DEL ART.	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
INTRODUCCION																																													
2- EXPLICA ANTECEDENTES CIENTIF Y FUDAM DEL ESTUDIO	0	1	1	0	0	0	0	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3- CONSIGNA OBJETIVOS ESPECIF E HIPOTESIS	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
METODOS																																													
4- PRESENTA ELEMENTOS CLAVE DEL TIPO DE DISEÑO	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1
4'- DECLARA OBJ GRAL DEL ESTUDIO ORIGINAL (SI HAY)	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
5- DESCRIBE MARCO, LUGARES, FECHAS DE RECOGIDA DE DATOS	1	1	1	1	1	0	0	0	1	1	1	0	0	0	1	0	0	1	0	1	1	0	0	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	1	1	0	1	1	1
6A- CRITERIOS INCL/EXCL, FUENTE Y METODOS DE RECOLECCION DE PART.	1	1	1	X	X	0	X	0	1	1	X	X	X	1	X	X	0	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	0	X	X	1	1	1	X	X	X	1	X	X	X	X
6B- DESCRIBE PERIODOS Y METODOS DE SEGUIM EN COHORTE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6C- DESCRIBE CRITERIOS PARA ELEGIR CASOS Y CONTROLES	X	1	1	X	1	X	X	X	1	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	0	X	X	1	1	1	X	X	X	1	X	X	X	X
7- DEFINE VARIABLES DE INTERES, PREDICTORAS, CONFUSORAS O MODIF.	0	1	1	0	1	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8A- DETALLA METODOS DE DETERMINACION PARA VARIABLES DE INTERES	0	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
8B- DESCRIBE LOS PROCEDIMIENTOS EN DISTINTOS GRUPOS	X	1	1	X	1	X	X	0	0	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	0	X	X	1	1	1	X	X	X	0	X	X	X	0
9- DESCRIBE MEDIDAS PARA AFRONTAR POTENC FUENTES DE SESGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10- DESCRIBE Y JUSTIFICA TAMAÑO DEL ESTUDIO (MUESTRA)	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
11A- DESCRIBE METODOS ESTADISTICOS PARA CONTROL DE CONFUSION	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	X	X	X	X	X	X	X	X	X	0	X	X	X	0	X	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11B- COH: PERDIDAS EN SEGUIMIENTO Y DATOS FALTANTES	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11B'- CC: TRATAMIENTO DE DATOS FALTANTES	X	1	0	X	0	X	X	X	0	X	X	X	X	0	X	X	X	X	X	X	X	X	X	X	0	X	X	X	0	X	0	X	0	X	X	0	0	0	X	X	X	0	X	X	X	X
11B''- TRANSV: EFECTOS DEL DISEÑO Y DATOS FALTANTES	0	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	X	X	X	X	1	X	X	0	X	X	0	X	X	X	X	X	X	X	X	X
11C- METODOS PARA ANALISIS DE SUBGRUPOS Y SENSIBILIDAD	X	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X	X	X	X	0	X	X	X	0	X	0	X	0	X	X	0	0	0	0	0	X	0	X	X	X	X
12A- ANALISIS DE EXPOSICIONES CUANTITATIVAS	X	0	0	X	1	0	0	0	0	0	0	0	X	X	0	0	0	0	0	X	X	X	X	X	0	X	X	X	0	0	X	X	0	X	X	X	X	X	X	0	X	0	X	X	0	0
12B- RESULTADOS DE ANALISIS CONTINUOS Y AGRUPADOS	X	0	0	X	0	0	0	0	0	X	X	X	X	X	X	X	0	X	X	X	X	X	X	X	0	X	X	X	0	X	1	X	0	X	X	0	0	0	X	X	X	0	X	X	0	X
13- FUENTES DE FINANCIACION	0	1	0	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	X	0	1	0	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0
RESULTADOS																																													
14A- NUM DE INDIV POTENC ELEGIBLES, EXAMINADOS. INCLUIDOS Y ANALIZADOS	0	1	0	X	1	0	X	1	0	X	X	X	0	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	0	X	X	1	1	1	X	X	X	1	X	X	X	X
14B- RAZONES DE NO PARTICIP EN CADA ETAPA DEL PROCESO EXPLICADAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	0	X	X	X	0
14C- DIAGRAMA DE FLUJO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
14D- FECHAS PERIODO RECLUTAMIENTO	1	1	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1	0	0	1	0	0
14E- NUMERO DE CONTROLES X CASO EN ESTUDIOS APAREADOS	0	0	0	X	0	X	X	X	0	X	X	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	0	X	0	X	X	0	0	0	X	X	X	0	X	X	X	X
15A- CARACT DE PARTICIP, INFO DE EXPOSICIONES Y CONFUND	0	0	1	X	1	X	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	1	X	0	X	X	0	0	0	X	X	X	0	X	X	X	X
15B- INDICA PARA CADA VARIABLE EXHAUSTIVIDAD DE LOS DATOS	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15C- MEDIA, DURACION TOTAL Y FECHAS DE SEGUIMIENTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16- COH: NUMERO DE SUCESOS DEL EVENTO	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16- CC: NUMERO DE C Y C EN CADA CATEGORIA DE EXPOSICION	X	1	1	X	1	X	X	X	1	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	1	X	0	X	X	1	1	1	X	X	X	1	X	X	X	X
16- NUMERO DE SUCESOS DEL EVENTO O MEDIDAS RESUMEN PARA CADA GRUPO EN COM	0	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	X	X	1	X	X	1	X	X	X	X	X	X	X	X
17A- MEDIDAS DE ASOCIACION PARA VARIABLES DE CONFUSION	X	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17B- VALOR MEDIANO PARA VARIABLES CUANTITATIVAS	X	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17C- MEDIDAS RELATIVAS EN DIFERENCIAS ABSOLUTAS DE RIESGO	X	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17D- RESULTADOS AJUSTADOS PARA VARIABLES DE CONFUSION	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18- INFORMA OTROS ANALISIS REALIZADOS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DISCUSION																																													
19- RESUMEN DE HALLAZGOS EN RELACION A HIPOTESIS	0	1	0	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
20A- DISCUSION DE LIMITACIONES TENIENDO EN CUENTA SESGOS	1	1	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	X	1	1	0	0	0	0	1
20B- NO SUSTITUYE POR ANALISIS CUANTIT DE SENSIBILIDAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21- DISCUTE VALIDEZ EXTERNA (GENERALIZACION DE RESULT.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22- APORTA INTERPRETACION GLOBAL DE RESULTADOS EN EL CONTEXTO DE LA EVIDENCIA	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Annex 3. Articles processed in the systematic review

Author and year	Country	Qualification
Martínez García and Trescastro López, 2016 (17)	Spain.	Food and nutrition education activities for 3rd grade students at the "La Serranica" Public School in Aspe (Alicante): Pilot experience.
Rios Castillo et al., 2020. (18)	Panama.	A short-term pilot intervention in food and nutrition education to combat overweight among primary schoolchildren in Panama.
Kain Berkovic et al., 2008. (19)	Chili.	Effectiveness of an intervention in nutritional education and physical activity to prevent obesity in schoolchildren in the city of Casablanca, Chile (2003-2004).
Rodrigo Cano et al., 2016. (20)	Spain.	Assessment of the effectiveness of nutritional education in preschool children, parents and educators.
Gago et al., 2014. (21)	Peru.	Effectiveness of a multisectoral intervention in food and nutrition education to prevent and control overweight and obesity in schoolchildren at two public educational institutions in the Villa El Salvador district.
Del Campo et al., 2010. (22)	Argentina.	Nutritional education (NEE) in municipal primary education in Córdoba. An experience in participatory action research (PAR). 2008.
Scruzzi et al., 2014. (23)	Argentina.	School health: an educational intervention in nutrition from a comprehensive approach.
González Rodríguez et al., 2015. (24)	Cuba.	Nutritional education intervention in patients with type 2 diabetes mellitus.
Montenegro et al., 2014. (25)	Chili.	Evaluation of a nutritional education intervention for preschool and elementary school teachers and students in the Los Andes commune in Chile.
Guillamón et al., 2017. (26)	Spain.	Assessing the effectiveness of nutritional education in primary school children: a pilot study.
Lobos Fernández et al., 2013. (27)	Chili.	Evaluation of an educational intervention for the prevention of childhood obesity in elementary schools in Chile.
Cubero Juanez, et al., 2017. (28)	Spain.	School breakfast: an educational intervention in healthy eating and nutrition.
Leite et al., 2016. (29)	Brazil.	Knowledge about food and nutrition after developing nutritional education activities among child and adolescent athletes.
Olivares et al., 2003. (30)	Chili.	Nutrition education in Chile's elementary schools.
Barrera Sánchez et al., 2014. (31)	Colombia.	Educational intervention to modify knowledge, attitudes, and practices regarding nutrition in Boyacá, Colombia.
Ríos et al., 2017. (32)	Paraguay.	Effect of a nutritional educational intervention in a work environment.

Arroyo y Reel, 2018. (33)	Mexico.	Intervention aimed at modifying eating practices in Mexican adolescents.
Sánchez et al., 2018. (34)	Argentina.	Nutritional assessment and interventions in hemodialysis patients.
Cruz Bello et al., 2019. (35)	Mexico.	Improving adolescents' eating knowledge and behavior with an educational intervention based on dietary guidance.
Macías-Matos et al., 2021. (36)	Cuba.	Participatory nutritional intervention among secondary school adolescents in the municipality of Old Havana.
Navarrete, 2016. (37)	Argentina.	Application of playful and didactic strategies in nutritional education in preschoolers of Kindergarten No. 933 Jorge Newbery, General Pueyrredón District.
Bello Lujan, 2009. (38)	Spain.	Nutritional education in obesity control through non-traditional interventions.
González Rodríguez et al., 2020. (39)	Spain.	Nutritional education through project-based work in Primary Education.
Cárdenas Castaño et al., 2021. (40)	Colombia.	Food and nutrition education as part of the care provided to young people with Down syndrome at a specialized foundation in Medellín, Colombia.
Caballero and Blas, 2011. (41)	Peru.	Effect of a nutritional intervention on the prevalence of anemia in children aged 6 to 9 years in public educational institutions in Cercado de Lima.
Follonier et al., 2014. (42)	Argentina.	Food education: impact on the choice of healthy products at school kiosks.
Araujo and Acosta, 2013. (43)	Paraguay.	Level of knowledge and eating habits pre- and post-training in the Paraguayan Dietary Guidelines for children over 2 years of age, in families in urban and rural areas.
Salinas et al., 2016. (44)	Chili.	Evaluation of a nutritional education intervention for construction workers to prevent chronic non-communicable diseases in Chile.
Bujanda Sainz de Murieta et al., 2014. (45)	Spain.	Evaluation of a nutritional intervention in older adults: the Edumay project.
Fretes et al., 2013. (46)	Chili.	Effect of an educational intervention on fruit, vegetable, and fish consumption in families of preschool and school-aged children.
Castellanos Ruelas et al., 2018. (47)	Mexico.	Nutritional diagnosis and dietary guidance intervention in two rural communities of peasant women in southeastern Mexico.
Salinas et al., 2014. (48)	Chili.	Theoretical and methodological bases for a healthy eating education program in schools.
Sánchez et al., 2017. (49)	Chili.	Evolution of knowledge about nutrition: an educational intervention in university students.

Paravano et al., 2019. (50)	Argentina.	Eating habits in young adults before and after an educational intervention.
Biblioni et al., 2017. (51)	Spain.	Improving dietary quality and nutritional status in children through an innovative nutrition education program: INFADIMED.
Aparco et al., 2017. (52)	Peru.	Evaluation of the impact of the "playful" educational-motivational intervention to prevent obesity in schoolchildren in Cercado de Lima: results after the first year.
Rico Sapena et al., 2019. (53)	Spain.	Effects of an alternative program promoting healthy eating in school cafeterias.
Fausto Guerra et al., 2018. (54)	Mexico.	Effect of a participatory educational intervention to prevent obesity in a rural community in Jalisco.
Ríos Castillo, 2020. (55)	Panama.	Nutritional Food Education (NFE) intervention program to combat overweight and obesity in primary schoolchildren in Panama from the perspective of public nutrition policies.
Martil Marcos et al., 2019. (56)	Spain.	Effectiveness of a community nursing intervention in the school setting to improve eating, physical activity, and sleep habits.
Cabrera Pivaral et al., 2004. (57)	Mexico.	Impact of participatory education on body mass index and glycemia in obese individuals with type 2 diabetes.
Sánchez Socarrás et al., 2015. (58)	Spain.	Evolution of knowledge about eating disorders through an educational intervention in post-compulsory education students.
Sánchez Juan, 2019. (59)	Spain.	Evaluation of a nutritional education program in patients with chronic kidney failure in predialysis.
Elvira Carrascal et al., 2022. (60)	Spain.	Impact of a nutritional education intervention for hemodialysis patients measured using the Malnutrition Inflammation scale and electrical bioimpedance.
Pontes et al., 2022. (61)	Portugal.	Nutritional education intervention to promote nutritional knowledge in preschool children in the Leiria District, Portugal.

Appendix 4. Search strings used to search for information (repeated in each search engine and in all three languages).

- "Nutrition Sciences" AND "Food and Nutrition Education" AND "Communication"
- "Nutrition Sciences" AND "Interventions in Food and Nutrition Education" AND "Communication in/for Health"
- "Food and Nutrition Education" AND "Communication" AND "Media"
- "Communication in/for health" AND "Food and Nutrition Education" AND "Nutrition Sciences"
- "Interventions in Food and Nutrition Education" AND "Media" AND "Communication"
- ("Food and Nutrition Education" OR "Interventions in Food and Nutrition Education") AND ("Communication" OR "Communication in/for Health")
- ("Nutrition Sciences" OR "Food and Nutrition Education") AND ("Communication in/for Health" OR "Media")
- "Food and Nutrition Education" AND ("Communication" OR "Media")
- ("Communication in/for health" OR "Communication") AND ("Interventions in Food and Nutrition Education")
- ("Nutrition Sciences" OR "Interventions in Food and Nutrition Education") AND "Media"