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Health Promotion Interventions in the School Environment for the Prevention of Risk Factors for Chronic Non-Communicable Diseases (NCDs) in Adolescents: A Literature Review

Intervenções de promoção da saúde no ambiente escolar para prevenção de fatores de risco de Doenças Crônicas Não Transmissíveis (DCNT) em adolescentes: uma revisão bibliográfica

Intervenciones de Promoción de la Salud en el Entorno Escolar para la Prevención de Factores de Riesgo de Enfermedades Crónicas No Transmisibles (ECNT) en Adolescentes: Una Revisión Bibliográfica

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Abstract:
Introduction: Chronic Non-Communicable Diseases (NCDs) represent a major public health problem and are associated with risk factors such as unhealthy eating habits, physical inactivity, smoking, and alcohol consumption. The increasing prevalence of these diseases among adolescents highlights the need for preventive actions from an early age. In this context, the school environment stands out as a strategic setting for health promotion and the development of healthy habits. Objective: To analyze the effectiveness of health promotion actions in the school environment in preventing NCDs and improving health-related behaviors among adolescents. Methodology: This is an integrative literature review composed of articles published between 2022 and 2026 that addressed the impact of nutritionists' performance in promoting adolescent health and reducing Chronic Non-Communicable Diseases (NCDs). The studies analyzed included school-based interventions, nutrition education strategies, and the encouragement of healthy lifestyle habits. Results and Discussion: The studies demonstrated that the nutritionist's role in the school environment significantly contributes to reducing the consumption of ultra-processed foods, improving dietary habits, and preventing Chronic Non-Communicable Diseases (NCDs) among adolescents. Face-to-face and practical interventions proved to be more effective than exclusively digital strategies, promoting more consistent changes in eating behaviors. In addition, positive impacts were observed among parents and teachers, extending the effects of these actions to both the family and school environments. The findings reinforce the school as a strategic setting for health promotion and highlight the importance of nutritionists in nutrition education and the establishment of long-lasting healthy habits. Conclusion: This review demonstrates that the school environment plays an essential role in preventing Chronic Non-Communicable Diseases (NCDs) by promoting healthy eating habits and reducing the consumption of ultra-processed foods. In this context, nutritionists act as agents of change, generating positive impacts that also reach the family environment. The studies indicate that face-to-face interventions are more effective than digital strategies, reinforcing the importance of the nutritionist's humanized approach. The participation of parents and teachers enhances outcomes, expanding the reach of health promotion actions throughout the entire school community.

Keywords:
School Environment; Adolescents; Chronic Non-Communicable Diseases; Food and Nutrition Education; Nutritionist.

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Resumo:
Introdução: As Doenças Crônicas Não Transmissíveis (DCNT) representam um importante problema de saúde pública e estão associadas a fatores de risco como alimentação inadequada, sedentarismo, tabagismo e consumo de álcool. O aumento dessas doenças entre adolescentes evidencia a necessidade de ações preventivas desde a juventude. Nesse contexto, o ambiente escolar destaca-se como um espaço potencial para a promoção da saúde e o desenvolvimento de hábitos saudáveis. Objetivo: Analisar a eficácia das ações de promoção da saúde no ambiente escolar na prevenção das DCNT e na melhoria dos comportamentos relacionados à saúde entre adolescentes. Metodologia: Trata-se de uma revisão integrativa da literatura, composta por artigos publicados entre 2022 e 2026, que abordam o impacto da atuação do nutricionista na promoção da saúde de adolescentes e na redução das Doenças Crônicas Não Transmissíveis (DCNT). Os estudos analisados contemplam intervenções no ambiente escolar, estratégias de educação alimentar e incentivo a hábitos saudáveis. Resultados e Discussões: Os estudos demonstraram que a atuação do nutricionista no ambiente escolar contribui significativamente para a redução do consumo de ultraprocessados, melhora da alimentação e prevenção das Doenças Crônicas Não Transmissíveis (DCNT) em adolescentes. As intervenções presenciais e práticas mostraram-se mais eficazes do que estratégias exclusivamente digitais, promovendo mudanças mais consistentes nos hábitos alimentares. Além disso, observou-se impacto positivo também em pais e professores, ampliando os efeitos das ações para o ambiente familiar e escolar. Os achados reforçam a escola como espaço estratégico para a promoção da saúde, destacando a importância do nutricionista na educação alimentar e na consolidação de hábitos saudáveis duradouros. Conclusão: A revisão evidencia que o ambiente escolar é essencial na prevenção das Doenças Crônicas Não Transmissíveis (DCNT), promovendo hábitos alimentares saudáveis e reduzindo o consumo de ultraprocessados. Nesse contexto, o nutricionista atua como agente de transformação, com impactos que também alcançam o ambiente familiar. Os estudos indicam que intervenções presenciais são mais eficazes do que estratégias digitais, reforçando a importância da atuação humanizada do nutricionista. A participação de pais e professores potencializa os resultados, ampliando o alcance das ações para toda a comunidade escolar.

Palavras-chave:
Ambiente Escolar; Adolescentes; Doenças Crônicas Não Transmissíveis; Educação Alimentar e Nutricional; Nutricionista.

Resumen:
Introducción: Las Enfermedades Crónicas No Transmisibles (ECNT) representan un importante problema de salud pública y están asociadas a factores de riesgo como la alimentación inadecuada, el sedentarismo, el tabaquismo y el consumo de alcohol. El aumento de estas enfermedades entre los adolescentes evidencia la necesidad de acciones preventivas desde edades tempranas. En este contexto, el entorno escolar se destaca como un espacio estratégico para la promoción de la salud y el desarrollo de hábitos saludables. Objetivo: Analizar la eficacia de las acciones de promoción de la salud en el entorno escolar para prevenir las ECNT y mejorar los comportamientos relacionados con la salud entre los adolescentes. Metodología: Se trata de una revisión integradora de la literatura compuesta por artículos publicados entre 2022 y 2026 que abordaron el impacto de la actuación del nutricionista en la promoción de la salud de los adolescentes y en la reducción de las Enfermedades Crónicas No Transmisibles (ECNT). Los estudios analizados incluyeron intervenciones en el entorno escolar, estrategias de educación alimentaria y estímulo de hábitos de vida saludables. Resultados y discusión: Los estudios demostraron que la actuación del nutricionista en el

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entorno escolar contribuye significativamente a reducir el consumo de alimentos ultraprocesados, mejorar la alimentación y prevenir las Enfermedades Crónicas No Transmisibles (ECNT) en adolescentes. Las intervenciones presenciales y prácticas resultaron más eficaces que las estrategias exclusivamente digitales, promoviendo cambios más consistentes en los hábitos alimentarios. Además, se observaron impactos positivos en padres y profesores, ampliando los efectos de estas acciones al entorno familiar y escolar. Los hallazgos refuerzan a la escuela como un espacio estratégico para la promoción de la salud y destacan la importancia del nutricionista en la educación alimentaria y en la consolidación de hábitos saludables duraderos. Conclusión: La revisión evidencia que el entorno escolar es esencial para la prevención de las Enfermedades Crónicas No Transmisibles (ECNT), promoviendo hábitos alimentarios saludables y reduciendo el consumo de alimentos ultraprocesados. En este contexto, el nutricionista actúa como agente de transformación, generando impactos positivos que también alcanzan al entorno familiar. Los estudios indican que las intervenciones presenciales son más eficaces que las estrategias digitales, reforzando la importancia de una actuación humanizada del nutricionista. La participación de padres y profesores potencia los resultados y amplía el alcance de las acciones de promoción de la salud a toda la comunidad escolar.

Palabras clave:
Entorno Escolar; Adolescentes; Enfermedades Crónicas No Transmisibles; Educación Alimentaria y Nutricional; Nutricionista.

INTRODUCTION

Non-communicable chronic diseases (NCDs) are among the main public health problems in Brazil and the world, accounting for approximately 70% of deaths, with the main risk factors being smoking, inadequate diet, sedentary lifestyle, and alcohol consumption, according to the World Health Organization (2023). Currently, these diseases are not limited to the elderly population, being observed with increasing frequency among adolescents and young people. Their early onset is mainly associated with lifestyle factors, highlighting the importance of prevention and health promotion actions from the early stages of life (World Health Organization, 2023).

From a complementary perspective, the Ministry of Health (2021) emphasizes that NCDs (Non-Communicable Diseases) constitute multifactorial etiological conditions that progress dangerously throughout the life cycle. Clinically, obesity, type 2 Diabetes Mellitus (DM2), and Systemic Arterial Hypertension (SAH) stand out, whose trajectories are severely impacted by modifiable behavioral determinants (BRAZIL, 2021). Factors such as smoking, harmful alcohol consumption, sedentary lifestyle, deleterious dietary patterns, and excessive sodium and simple sugar intake act as critical precursors for the early onset of these pathologies (World Health Organization, 2023). Given this scenario, the implementation of preventive

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strategies in the school environment becomes necessary, since adolescence represents the fundamental period for the consolidation of lifestyle habits that tend to persist into adulthood (BRAZIL, 2021).

From this perspective, the school environment is configured as a strategic and privileged space for the implementation of measures to promote and prevent risk factors (World Health Organization, 2023). According to data from the World Health Organization (2023), a study conducted with adolescents aged 11 to 17, predominantly elementary and high school students, showed that lifestyle habits and dietary patterns established during youth tend to persist throughout life, directly influencing health in adulthood. This period is marked by the consolidation of habits and behaviors, such as sedentary lifestyle, inadequate diet, and substance use. and sleep deprivation, which can negatively impact future health (World Health Organization, 2023).

Thus, the choice of this target audience is justified by the relevance of early interventions in school environments, considered strategic spaces for health promotion, aiming at the prevention of chronic non-communicable diseases and the strengthening of healthy practices throughout life (World Health Organization, 2023).

In the context of national epidemiological surveillance, the federal government instituted the "Strategic Action Plan for Addressing Chronic Diseases and Non-Communicable Diseases in Brazil 2021-2030" as a central mechanism to mitigate the impact of NCDs, which are the leading cause of mortality in the country, accounting for 54.7% of deaths recorded in 2019 (World Health Organization, 2023) . According to the guidelines of the aforementioned action plan, controlling modifiable behavioral determinants, monitored via Vigitel and which include smoking, physical inactivity, and inadequate nutrition associated with the consumption of ultra-processed foods, requires the implementation of intersectoral policies that act directly on the social determinants and health choices of the population.

According to the National Fund for the Development of Education (FNDE), in Brazil strategies are being developed to strengthen school meals, including the creation of nutritionally adequate menus and the encouragement of the consumption of *unprocessed* or minimally processed foods, according to the guidelines of the Ministry of Education (2020).

In this context, the National School Feeding Program (PNAE) highlights the essential role of nutritionists in developing Food and Nutrition Education (FNE) actions, acting as an instrument for the prevention of Non-Communicable Chronic Diseases (NCDs) and promoting the formation of healthy eating habits during childhood and adolescence, which consequently favors the reduction of risks associated with inadequate diet and sedentary lifestyles, especially

with regard to prevention, health promotion, and action on social determinants. (BRAZIL, 2020).

Therefore, the overall objective of this study is to analyze the effectiveness of health promotion in the school environment in improving health-related behaviors, as well as its impact on the prevention of Non-Communicable Chronic Diseases (NCDs) in adolescents. It also seeks to understand how interventions developed in the school environment can contribute to reducing risk factors associated with NCDs and to promoting health among adolescents.

METHODOLOGY

This research is structured as an integrative review, with an analytical and descriptive approach, bringing together the main scientific contributions within the defined period. This process seeks to synthesize evidence that allows us to answer the following guiding question: "How can health promotion interventions in the school environment contribute to the prevention of risk factors for Non-Communicable Chronic Diseases (NCDs) in adolescents?"

The analysis The theoretical framework was operationalized through consultation of reliable academic and scientific websites, with emphasis on the PubMed (US National Library of Medicine) and SciELO (Scientific Journal of Economics) databases. (Electronic Library Online). The selection of sources for this study was carried out through a detailed search, using keywords in English to encompass a greater number of relevant research studies on the topic.

To construct this literature review on health promotion, the terms were combined using the Boolean operators “AND” and “OR” as follows: "adolescentes" OR " adolescents " AND "ambiente escolar" OR " school setting" AND "promoção da saúde" OR " health" The goal of this approach was to gather concrete data on how educational activities and health initiatives impact the daily lives of young people in the school environment. This strategy allowed for the clear and comprehensive organization of the information, ensuring that the perspective presented in the article is based on reliable studies of scientific quality.

The selection of sources for this study was based on choosing original primary source articles from 2022 to 2026, available for full reading and written in Portuguese and English. The objective of the analysis was to identify research that demonstrated the impact of school-based strategies on the reduction or development of Non-Communicable Chronic Diseases (NCDs).

Studies that assessed important risk factors, such as obesity, insulin resistance, and high blood pressure, were prioritized, focusing specifically on young people and adolescents.

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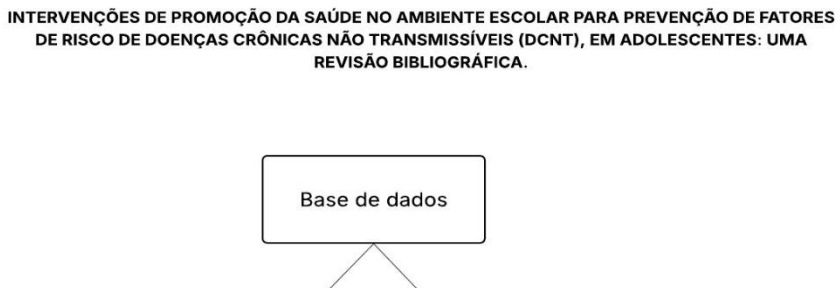
Regarding exclusion criteria, studies that were duplicates across databases and those published outside the defined period (i.e., before 2022) were discarded. Additionally, conference abstracts, dissertations, and monographs, as well as opinion pieces, editorials, and letters to the editor, were disregarded. Finally, review articles that lacked an analytical or systematic approach to the results were excluded.

The process of searching for materials was structured in systematic steps. Initially, studies were identified in the selected databases using previously defined descriptors aligned with the research topic. Next, studies were screened based on titles and abstracts, considering established inclusion and exclusion criteria, in order to select only publications relevant to the study's objective. Finally, eligible articles were read in full, allowing for the extraction, organization, and analysis of information related to the role of health promotion interventions in the school environment in preventing risk factors and improving the quality of life of adolescents.

The identification and selection stage of the studies was represented by a flowchart (Figure 1), which details the phases of the process, from the initial search in the databases to the final inclusion of the articles that comprised the review.

Figure 1 - Flowchart of the selection of articles chosen for the current research.



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Source: developed by the authors, 2026.

Table 1 below summarizes the main information for each scientific article included in the research, encompassing authors, study design, year of publication, location, sample characteristics, objectives, methodology employed, and main results. The 6 articles were published in English and Portuguese and are primary studies published in national and international journals, conducted in India, Texas, Australia, and Portugal.

Table 1. Summary of articles analyzed for review.

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Articles	Author, year publication, study location	Outline, type of study and N	Study objectives	Methodology	Key findings
1	Kaur S., *et al.* 2026 India	Randomized controlled trial. N= 12 public schools (8th grade students)	The study assessed whether a intervention Schooling, with parental involvement, reduces consumption of ultra-processed and improve dietary habits, contributing to prevention NCDs in teenagers	The intervention included 11 Educational meetings for teenagers over 6 months, plus a one-off session for parents, focusing on raising awareness about reducing consumption of ultra-processed foods and the encouragement of healthier eating habits.	The school intervention significantly reduced consumption of ultra-processed foods among the teenagers, demonstrating that strategies Educational activities in the school environment are effective in improving eating habits and contributing to the prevention of NCDs (Non-Communicable Diseases).
2	Kaur S., et *al.* 2024 India	Randomized, controlled trial N = 453 adolescents ; 395 (parents of adolescents) 94 (teachers)	To evaluate the effect of a health promotion intervention on the environment. behavioral risk factors for chronic diseases.	Cluster-controlled trial in 12 schools, with teenagers, parents and teachers, based on the model PRECEDEPROCEED; included educational food sessions, with assessment of risk factor reduction.	The school intervention reduced behavioral risk factors among adolescents, such as salt and alcohol consumption, and increased fruit intake and physical activity levels.

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3	Kaur S., *et et al.* 2022 India	Experimental study, N = 360 students (10 to 16 years old)	To evaluate the effectiveness of a package of health promotion interventions in environment behavioral risk factors for chronic diseases among adolescents, their teachers, and parents.	Randomized cluster study in 6 schools and 12 groups (30 students). Over six months to promote healthy habits and reduce risk factors. behavioral risks.	The study demonstrated Improvements in nutritional education, fruit and vegetable consumption, sugar and salt reduction, and the promotion of healthy habits in the school environment, highlighting the importance of nutritionists in promoting collective and school health.
4	O'Dean , Siobhan *et al.* 2024 Australia	Randomized controlled trial. N = 71 public schools selected.	Evaluate the effectiveness of intervention Health4Life aims to modify risk factors for chronic diseases in adolescents.	Cluster-randomized controlled trial (schools), with digital intervention applied in the classroom and follow-up of students over time to assess changes in risk factors.	The study showed that the Health4Life intervention, Based on educational video lessons and digital technology, it did not present significant results in reducing risk factors such as alcohol consumption, poor diet, and excessive time spent in devices electronic devices. The findings reinforce the importance of more effective strategies for promoting health in person at school, highlighting the role of nutritionists in nutritional education and the prevention of chronic diseases among adolescents.

5	Jeans, MR, *et al.* 2023 Texas	Study randomized N=16 schools	The aim of the study was to assess whether the intervention Texas Sprouts , based in gardening,	Randomized school trial with gardening and education intervention. nutritional,	The TX Sprouts study demonstrated that educational interventions involving gardening, cooking, and nutrition...
			cooking and education nutritional, influences food consumption, and observing changes in the intake of unprocessed and ultra-processed foods s.	evaluating the diet using 24-hour recalls and classification NEW.	contributed to the increase in the consumption of *fresh, unprocessed foods* and a reduction in ultra-processed foods among low-income adolescents, highlighting the importance of nutritionists in nutritional education and health promotion in the school environment.
6	MachadoRodrigues , Aristides M. *et al.* 2024 Portugal	Study transversal N= 245 teenagers (12 to 17 years old)	Compare consumption of ultra-processed s, This study aims to examine the relationship between sedentary behavior and well-being between genders, and to analyze its correlation with the risk of overweight in adolescents.	Cross-sectional study with adolescents, using anthropometric measurements, Questionnaires on consumption of ultra-processed foods, sedentary behavior, and well-being , with statistical analysis using correlation and regression.	There was no difference between boys and girls in consumption of ultra-processed foods; boys showed more time spent in sedentary activities with electronics and greater well-being; and the consumption of Ultra-processed foods showed an association with a higher risk of overweight, but without statistical significance.

Source: developed by the authors, 2026

RESULTS AND DISCUSSION

The analyzed studies presented different methodological approaches, predominantly randomized clinical trials and in-person school interventions, mostly with positive results in reducing the consumption of ultra-processed foods, improving diet, and promoting healthy

habits. Although one study based exclusively on digital technology did not present significant results, its findings reinforced that electronic strategies, in isolation, do not replace the in-person and humanized work of the nutritionist in the school environment.

In general, studies converge in highlighting the importance of nutritionists in promoting health and in food and nutrition education as fundamental strategies for the prevention of Non-Communicable Chronic Diseases (NCDs). In addition to positively impacting adolescents, the interventions also reached parents and teachers, demonstrating that the nutritionist's work has a broad effect on the entire school and family community.

Kaur 's study *et al* ., (2026), a cluster-randomized clinical trial was conducted in 12 public schools in the city of Chandigarh , India, involving 8th-grade adolescents and their parents. The intervention was based on the PRECEDE-PROCEED Model, widely used in health promotion programs, and consisted of 11 educational sessions conducted over six months with the adolescents. Simultaneously, the parents participated in an educational session focused on raising awareness about the risks of consuming ultra-processed foods and the importance of adopting healthier eating habits.

To assess the effectiveness of the intervention, 24-hour dietary recalls were conducted at two distinct times, at the beginning and end of the study. The foods consumed were classified according to the NOVA system, which categorizes foods according to their degree of industrial processing. The results demonstrated a significant reduction in energy consumption from ultra-processed foods among the participating adolescents, with an average decrease of 1,062 kcal/day. A reduction in the consumption of processed foods was also observed, highlighting the effectiveness of the educational actions carried out in the school environment. In contrast, there were no significant changes in the consumption of minimally processed foods.

The findings reinforce the importance of the school environment as a strategic space for promoting health and preventing Non-Communicable Chronic Diseases (NCDs). The high student participation in the activities demonstrates that continuous and structured in-person interventions can contribute to positive changes in adolescents' eating habits. Thus, the study shows that educational activities in schools constitute a relevant tool for reducing the consumption of ultra-processed foods and promoting healthier eating habits during adolescence.

Kaur 's investigation *et al* . (2024), conducted with 453 adolescents in India, the intervention involving parents, teachers, and students showed positive results, with a reduction in salt consumption and improved levels of physical activity. The study's distinguishing feature was the impact observed also in adults, especially parents and teachers, who increased their

consumption of fruits and vegetables, demonstrating that family involvement strengthens health promotion actions. In this context, the fundamental role of the nutritionist in the school environment is evident, acting broadly and strategically through educational activities, meetings, and guidance directed not only to adolescents but also to families and the school community. The findings reinforce that the nutritionist's role extends beyond the school, promoting changes in eating habits within the family environment and contributing to the formation of healthy habits that can persist into adulthood.

Despite its success, the intervention did not affect tobacco use or sugar intake, indicating that some risky habits are more resistant to general school programs and may require specific strategies. These results reinforce that the model is effective for primary prevention, as it allows "reaching young people early" and disseminating healthy habits beyond the school gates, impacting the school community as a whole.

Kaur 's present research *et al.,* (2022), was carried out A health promotion intervention in the school environment aimed at adolescents, parents, and teachers, using the PRECEDE-PROCEED model as a basis for planning and implementing the actions. The strategy included educational activities on healthy eating, physical activity, and prevention of alcohol and tobacco use, developed over six months in public schools in India.

The findings suggest that the school environment is a strategic location for preventing risk factors associated with NCDs (Non-Communicable Diseases), since many of these behaviors are acquired during adolescence. The inclusion of parents and teachers in the educational process strengthens the creation of a support network capable of promoting more lasting behavioral changes. Another relevant aspect was the use of a theoretical model to guide the intervention, allowing for a structured approach adapted to the sociocultural characteristics of the participants. The study also highlights the importance of continuous and multifactorial actions that simultaneously address nutrition, physical activity, and prevention of harmful substance use.

Thus, the expected results reinforce the potential of school interventions to promote healthy habits, reduce behavioral risk factors, and contribute to the early prevention of NCDs, highlighting the need to expand this type of strategy in low- and middle-income countries.

The intervention was considered successful for the adolescent population, validating the effectiveness of the applied method as a benchmark for primary prevention in the educational environment. The study demonstrated that the school is a strategic field for modifying risk factors for chronic non-communicable diseases, although it encountered limitations when attempting to alter the eating behavior of parents, who did not show significant changes. These

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results reinforce that, to ensure the sustainability of the changes, health policies must seek a deeper integration between the school ecosystem and the home environment.

The point of convergence between these three studies by Kaur *et al., (* 2022 *),* is the validation of the PRECEDE-PROCEED Model, a health promotion planning model used to develop, implement, and evaluate educational interventions, considering social, behavioral, and environmental factors that influence population health, focusing simultaneously on adolescents, parents, and teachers. In common, the findings demonstrate that the intervention was able to generate real changes in risk habits, such as a significant reduction in the consumption of ultra-processed foods, a decrease in salt intake, and a drop in the prevalence of alcohol use, in addition to promoting increased levels of physical activity, thus reinforcing the role of the nutritionist with educational activities aimed at parents and students in the school environment, which plays a crucial role in the formation of healthy habits and the prevention of chronic diseases from adolescence onwards.

In the Health4Life study, conducted in 71 schools with a sample of 6,640 seventh-grade students, an eHealth intervention was evaluated. This intervention uses digital technologies such as apps, online platforms, video lessons, and electronic devices to promote health education, prevention, and care. The results showed that the intervention was not statistically more effective than conventional health education in modifying twelve behavioral outcomes. After 24 months of follow-up, the results did not indicate significant changes in critical factors such as inadequate fruit and vegetable intake, increased light physical activity, or reduced frequency of alcohol and tobacco use.

It is observed, therefore, that exclusively electronic interventions do not present the same effectiveness as face-to-face actions, reinforcing the importance of the nutritionist's direct involvement in the school environment. Thus, it is highlighted that humanized contact, continuous monitoring, and in-person activities with students and families are fundamental to promoting real changes in eating habits and preventing chronic diseases.

These data suggest greater resistance to changing habits when interventions are mediated exclusively by digital platforms without intensive engagement strategies. In conclusion, the intervention was unsuccessful in surpassing regular schooling in modifying risk factors for chronic diseases in adolescents. This result presents an important divergence from Kaur 's series of studies. *et al.,* (2022), in India, where interventions took place in person and were structured according to the PRECEDE-PROCEED Model. These findings mean that, although the school is a strategic setting, the delivery format (digital *vs.* in-person) and the density of activities are fundamental determinants for health promotion to result in lasting

clinical and behavioral changes. Even with advances in technology and digital interventions, they do not replace the presence and role of the nutritionist in the school environment; in-person and humanized follow-up is essential to promote effective nutritional education and lasting changes in lifestyle habits.

The Texas Sprouts experiment , a cluster-randomized clinical trial conducted with 468 low-income adolescents in 16 elementary schools in Texas, evaluated the impact of a gardening, cooking, and nutrition education program on the consumption of processed and ultra-processed foods. The main findings demonstrated that the intervention resulted in a significant increase in the consumption of unprocessed foods (2.3%) and a significant reduction in the intake of ultra-processed foods. (-2.4%), compared to the control group. Notably, the effect was even more pronounced among adolescents, reinforcing the effectiveness of strategies that use direct contact with food cultivation and preparation to modify the dietary profile of vulnerable populations based on the health promotion that the nutritionist applies, as their collaboration in this area is fundamental. In conclusion, the intervention demonstrated that the integration of school gardens and practical cooking activities improves the quality of food, favoring the replacement of ultra-processed foods with *whole foods* . The findings reinforce the fundamental role of the nutritionist in the school environment, promoting food education and strategies that contribute to healthier habits and the prevention of chronic diseases from adolescence onwards.

In the research by Machado-Rodrigues *et al.* (2024), conducted in the districts of Coimbra and Viseu, Portugal, with a sample of 245 adolescents (12 to 17 years old), the objective was to evaluate the association between behavioral lifestyle and pediatric obesity. The authors identified that the consumption of ultra-processed foods is associated with a higher risk of overweight among young people, although with marginal statistical significance. A relevant finding was the identification that children of mothers with high levels of education were less likely to be classified as overweight or obese, which highlights the role of social determinants in health and the importance of the nutritionist in this scenario. This result is similar to the findings of Kaur. *et al.,* (2022), in India, reinforce that early nutritional inadequacy is a critical precursor to metabolic pathologies and NCDs, further emphasizing the role of the nutritionist in the school setting, promoting nutritional education and health, which positively impacts the future health of adolescents.

In conclusion, the study demonstrated that inadequate eating habits already negatively impact nutritional status in adolescence, reinforcing the need for early and targeted interventions. The findings highlight the importance of health policies and the implementation of strategies that consider the family's socio-educational context, since family involvement

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proved fundamental in promoting healthy eating and reducing the consumption of ultra-processed foods. Furthermore, the studies emphasize the essential role of nutritionists in the school environment, working on the nutritional education of adolescents and parents through educational strategies capable of promoting positive changes in lifestyle habits and contributing to the prevention of non-communicable chronic diseases.

The combined analysis of these studies demonstrates that the school environment is a strategic space for the prevention of chronic non-communicable diseases in adolescents. The study by Kaur *et al.* (2022), based on the PRECEDEPROCEED model, showed positive results in changing lifestyle habits. Similarly, the TX Sprouts project, a school intervention based on gardening, cooking, and nutritional education, also showed beneficial effects, such as increased consumption of *whole foods* and reduced consumption of ultra-processed foods, considered sources of empty calories. Thus, both studies complement each other by demonstrating that educational interventions associated with the role of a nutritionist in the school environment contribute significantly to the promotion of health and prevention of chronic diseases among adolescents.

On the other hand, the statistically null results of the Health4Life study and the marginal significance in Rodrigues *et al* . (2024) are equally interesting and fundamental to the conclusion of the topic. They prove that the simple transmission of information or the use of digital platforms without face-to-face support is insufficient to modify deeply ingrained habits. Furthermore, the relevance of the family context and maternal education indicates that health promotion in schools requires strategies that integrate the family ecosystem. Therefore, all the selected articles converge on the idea that primary prevention requires multifocal, practical, and socially contextualized approaches to be truly effective.

Despite the positive results found, some limitations should be considered. The studies were conducted in different countries and contexts, which may make it difficult to apply the results to other populations. Furthermore, there were differences in the methods used, follow-up time, and number of participants. Much of the data was obtained through questionnaires and self-reports from the participants, which may lead to errors in the information. Another important point is that most research only evaluated short-term effects, making it impossible to know if the changes in habits were maintained over time. Finally, some risky behaviors, such as alcohol, tobacco, and sugar consumption, proved more difficult to modify, indicating the need for continuous actions involving school, family, and community.

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CONCLUSION

This review highlighted that the school environment is one of the most powerful pillars for the prevention of Non-Communicable Chronic Diseases (NCDs) in adolescence. The studies analyzed demonstrated that interventions based on food and nutrition education were able to reduce the consumption of ultra-processed foods, encourage healthy habits, and transform behaviors even at the stage when lifestyle patterns are being built. The studies analyzed show that the role of the nutritionist in the school environment contributes significantly to health promotion, prevention of Non-Communicable Chronic Diseases (NCDs), and strengthening healthy eating habits among adolescents.

The findings reinforce that the role of nutritionists in schools goes beyond nutritional guidance. Their presence fosters connection, awareness, and a sense of belonging, allowing adolescents to understand food as a tool for health and quality of life. More than modifying food choices, nutritionists contribute to forming critical, conscious individuals capable of building a healthier relationship with their own bodies, with food, and with the future. The impact of these actions is not limited to the school, but resonates within homes and reaches the entire family dynamic.

One of the most relevant findings of this review was the observation that even studies that did not demonstrate positive results provided important evidence for understanding the investigated topic. Exclusively digital interventions showed that technologies, applications, and electronic platforms can help, but will never replace the humanized presence of a nutritionist. The analyzed studies suggest that exclusively digital strategies are less effective when compared to face-to-face interventions developed in the school environment. This finding reinforces the understanding that promoting health requires presence, continuity, and real human relationships.

Furthermore, studies have shown that when parents and teachers are included in interventions, the results become even more significant and lasting. This demonstrates that the nutritionist's work not only transforms the adolescent's life but also reverberates throughout families and strengthens the construction of a culture of collective health. Therefore, advocating for the presence of nutritionists in schools is advocating for prevention, quality of life, and a better future. Food and nutrition education initiatives represent a strategic importance in promoting health and preventing risk factors associated with NCDs (Non-Communicable Diseases).

Although the evidence found demonstrates the potential of school interventions in promoting health and preventing NCDs, some aspects deserve consideration during the interpretation of the results. It was found that a significant portion of the selected studies were developed by the same group of authors and in specific geographical contexts, which may reduce the diversity of perspectives contemplated in this review.

Furthermore, difficulty was observed in identifying Brazilian studies that directly addressed the role of nutritionists in the school environment focused on the prevention of NCDs in adolescents, which limited the inclusion of national evidence and the discussion of results in light of the Brazilian reality. Considering the cultural, social, economic, and structural differences between countries, it is important to interpret the findings with caution and encourage further research in the national context.

Nevertheless, the included studies demonstrated methodological quality and contributed consistently to the understanding of the topic, offering relevant evidence on the potential of school interventions in promoting health and preventing NCDs among adolescents.

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