

August 2024 Volume 103 e4697 DOI: https://doi.org/10.5281/zenodo.12169918

REVIEW ARTICLE

The professional practice of the primary health care specialist and his role in nutrition education El modo de actuación profesional del especialista de Atención Primaria de Salud y su rol en la educación nutricional

O modo de atuação profissional do especialista da atenção básica e seu papel na educação nutricional

Mirian Belkis Nápoles Valdés^{I*}, Felipe Machuca-Contreras^{II}, Alfredo Puican Carreño^{III}, Juan Carlos Granados Barreto^{III}

¹ Hospital Docente Provincial Camilo Cienfuegos. Sancti Spíritus, Cuba.

^{II} Universidad Autónoma de Chile. Santiago de Chile, Chile.

" Universidad Nacional Pedro Ruiz Gallo. Lambayeque, Perú.

*Corresponding author: mirianbnv70@gmail.com

Received: 10-06-2024 Accepted: 10-07-2024 Published: 02-08-2024

ABSTRACT

Introduction: the primary health care system in Cuba is based on a preventive and community approach. It is based on well-established guidelines and principles with emphasize on the importance of nutrition education at all stages of life, from childhood to adulthood. Objective: to analyze the primary health care specialist's professional mode of action and their role in nutritional education. Method: the literature review was carried out using a hermeneutical approach that followed the stipulated cycle and was aimed at collecting and analyzing sources of particular relevance. The methodology was developed in several stages and facilitated the analysis and interpretation of the data to construct the fundamental themes. Results: the results highlight that the primary health care specialist plays a fundamental role in nutritional education. His professional conduct is based on ethical principles, including

responsibility, respect, confidentiality, integrity, and honesty. In addition, they assume the role of educators and health promoters, acting as facilitators of change. Its primary goal is to empower patients, their families, and communities to make informed decisions that promote positive changes in their eating habits and lifestyles. Conclusions: the nutritional education these specialists provide enables any person to make correct decisions regarding their diet and lifestyle, positively impacting their health and well-being. It is essential to strengthen the education and training of primary health care specialists in nutrition to guarantee comprehensive and effective care.

Keywords: primary health care; medical education; nutritional education; primary care; public health





RESUMEN

Introducción: el sistema de atención primaria de salud en Cuba se basa en un enfoque preventivo y comunitario. Se basa en directrices y principios bien establecidos que hacen hincapié en la importancia de la educación nutricional en todas las etapas de la vida. desde la niñez hasta la edad adulta. Obietivo: analizar el modo de actuación profesional del especialista de atención primaria y su rol en la educación nutricional. Metodología: la revisión de la literatura se realizó mediante un enfoque hermenéutico que siguió el ciclo estipulado y se dirigió al recabado y análisis de fuentes de especial relevancia. La metodología se desarrolló en varias etapas y facilitó el análisis y la interpretación de los datos para la construcción de los temas fundamentales. Resultados: los resultados destacan que el especialista de atención primaria desempeña un papel fundamental en la educación nutricional. Su modo de actuación profesional se basa en principios éticos, incluyendo la responsabilidad, el respeto, la confidencialidad, la integridad y la honestidad. Además, asumen el rol de educadores y de la salud, actuando promotores como facilitadores del cambio. Su objetivo principal es capacitar a los pacientes, sus familias y comunidades para tomar decisiones informadas que promuevan cambios positivos en sus hábitos alimentarios y estilo de vida. Conclusiones: la educación nutricional impartida por estos especialistas capacita a los pacientes para tomar decisiones acertadas en relación con su alimentación y estilo de vida, generando un impacto positivo en su salud y bienestar. Es fundamental fortalecer la formación y capacitación de los especialistas de atención primaria en el campo de la nutrición, para garantizar una atención integral y efectiva.

Palabras clave: atención primaria de salud; educación médica; educación nutricional; salud pública

RESUMO

Introdução: o sistema de cuidados de saúde primários em Cuba baseia-se numa abordagem preventiva e comunitária. Baseia-se em diretrizes e princípios bem estabelecidos, com ênfase na importância da educação nutricional em todas as fases da vida, desde a infância até a idade adulta. Objetivo: analisar o modo de atuação profissional do especialista da atenção básica e seu papel na educação nutricional. Metodologia: a revisão da literatura foi realizada através de uma abordagem hermenêutica que seguiu o ciclo estipulado e teve como objetivo a recolha e análise de fontes de especial relevância. A metodologia foi desenvolvida em diversas etapas e facilitou a análise e interpretação dos dados para a construção dos temas fundamentais. Resultados: os resultados destacam que o especialista da atenção primária desempenha papel fundamental na educação nutricional. Sua conduta profissional é baseada em princípios éticos, incluindo responsabilidade, confidencialidade, respeito, integridade е honestidade. Além disso, assumem o papel de educadores e promotores de saúde, atuando como facilitadores de mudanças. O seu principal objetivo é capacitar os pacientes, as suas famílias e as comunidades para tomarem decisões informadas que promovam mudanças positivas nos seus hábitos alimentares e estilo de vida. Conclusões: a educação nutricional fornecida por estes especialistas permite aos pacientes tomar decisões corretas relativamente à sua dieta e estilo de vida, gerando um impacto positivo na sua saúde e bemestar. É fundamental reforçar a formação de especialistas em cuidados primários na área da nutrição, para garantir cuidados integrais e eficazes.

Palavras-chave: atenção primária à saúde; educação médica; educação nutricional; saúde pública

How to cite this article:

Nápoles Valdés MB, Machuca-Contreras F, Puican Carreño A, Granados Barreto JC. The professional practice of the primary health care specialist and their role in nutrition education. Rev Inf Cient [Internet]. 2024 [cited Access date]; 103:e4697. Available at: <u>http://www.revinfcientifica.sld.cu/index.php/ric/article/view/4697</u>





INTRODUCTION

Nowadays, nutrition education has become an essential component of primary health care. It plays a fundamental role in preventing and managing chronic non-communicable diseases.^(1,2) Its importance is such that it transcends the space of formal and disciplinary education (for example, health sciences), and it is part of public policies, food policies, and the media, among other processes and spaces that adapt their objectives and contents to cause changes in the lives of people in different circumstances, including those in unfavorable scenarios or conditions of vulnerability.^(3,4,5)

The World Health Organization (WHO) and other international institutions recognize nutrition education as a key strategy to address the growing problem of malnutrition and promote healthy lifestyles. Therefore, it seeks to provide people with the knowledge, skills and tools necessary to make informed decisions about their food and nutrition.⁽²⁾

Nutrition education involves not only providing information about nutrients and food groups but also encouraging the adoption of healthy eating behaviors. Nowadays, the importance of promoting a balanced diet, limiting the consumption of processed foods, and promoting physical activity have been increasingly recognized as fundamental elements of nutrition education. These aspects are considered key factors to improve health and prevent chronic diseases related to food and nutrition.^(6,7,8)

The primary health care system in Cuba is based on a preventive and community approach, where the primary health care specialist plays a central role in health promotion and disease prevention.^(9,10) The professional mode of action of the primary health care specialist in Cuba is based on well-established guidelines and principles, which are aligned with international approaches for nutrition education. These guidelines emphasize the importance of nutrition education at all stages of life, from childhood to adulthood, and recognize the need to adapt interventions to the cultural and socioeconomic characteristics of each population.^(11,12,13)

However, both at national and international level, nutrition education is often not an integral part of primary health care. In many countries, lack of resources, lack of adequate training and lack of awareness about the importance of nutrition education have hindered its effective implementation. This has led to a significant gap in health promotion and disease prevention related to food and nutrition, not only in poor countries but also in vulnerable communities and at-risk populations.^(14,15)

Therefore, it is essential to address the key aspects required to offer adequate nutrition education in the primary healthcare setting. This includes training health professionals in up-to-date nutritional knowledge, integrating nutrition education into medical school curricula and implementing effective health promotion strategies at the community level.^(16,17,18)

For this reason, the objective of this research was to analyze the theoretical foundations that support the professional performance of the Primary Health Care specialist as an integral part of medical professionalization, focusing on its role in nutrition education. It seeks to examine the conceptual and scientific bases that support the practices and strategies these professionals implement in relation to nutrition education in order to understand their contribution to health promotion and disease prevention through food and nutrition.





METHOD

Selection of review approach and research question

In response to the limitations diagnosed in the literature and those identified by the team of researchers, it was decided to use a flexible bibliographic review method oriented towards shortcomings, but that offered scope for the incorporation of sources and the discussion of the findings. In order to achieve this purpose, two primary considerations were developed to guide the search, collection, data processing and presentation of the results.

Firstly, it was taken into account that nutrition education is not always part of undergraduate and postgraduate medical curricula, nor is it always contained in professional practice.^(19,20) Secondly, it was taken into consideration that the structures of health systems differ worldwide, which means that nutrition education is not fully associated with the performance of the primary health care specialist.

In response to these elements, a hermeneutic literature review design was chosen, as this is an approach that allows not only the exploration of relevant sources and emerging lines but also its interactive nature (between the authors and the texts) and progress (progressive searches in function of information gaps) is essential in poorly formed and evolving fields. Furthermore, this type of study is characterized by generating new contributions from the triangulation of the analysis, the experience of the authors, and the texts collected. The fundamental research question was:

What should be the primary health care specialist's mode of action in carrying out adequate nutrition education?

Design and stages of the study

The specification of the review design was carried out based on the hermeneutic circle procedure, as recommended in the literature.^(21,22) This procedure makes it easier to research the available literature through successive searches, critical reading and individual-group interpretation, refinement of data, refinement of the search strategy and incorporation of new sources. Additionally, two essential criteria were inserted, theoretical sampling to refine the search for relevant articles, and saturation, to close the search and develop the themes (Figure 1).





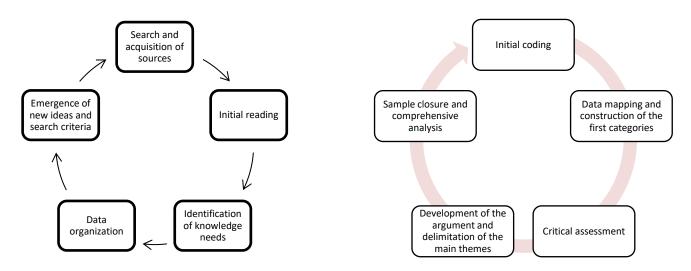


Fig. 1. Developed process (workflow).

Search strategy and data analysis

In order to guarantee the quality of the sources, a flexible search strategy was designed, targeting the variables: impact, visibility, relevance, thematic fit, and topicality. These variables were organized into a system of inclusion and exclusion criteria that established the selection of research articles first related to nutrition education and medical education but with a progressive strategy (nutrition education AND medical education AND (Figure 2), published in journals indexed in Scopus and WoS with a higher quartile or equal to 3 (Q3), in the period 2019-2024. As a result, editorials, essays, or other types of publications not reviewed by peers nor published by journals that did not meet the criteria were not considered. The Google Scholar search engine was used to collect sources and the verification was carried out using ScimagoJR.

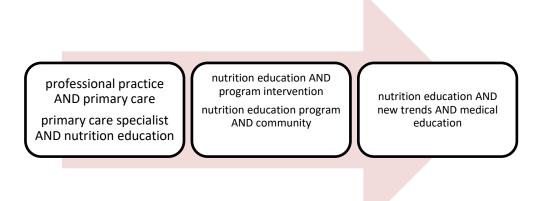


Fig. 2. Progressive research strategy and evolution of research keywords.





Due to this criteria system, articles in Spanish which thematic relevance would have included them as relevant were excluded, which was recognized as a limitation of this study. Furthermore, and with a set of analogous causes, articles from Cuba were left out that, although the focus was aimed at mainstream science, made it necessary to carry out extra searches.

The data analysis was carried out based on free and directed coding, the delimitation of the main associations between the codes, and the contrast between sources. As the process progressed, notes and appreciations from the authors were included to refine the analysis. The analysis process was stopped when checking two fundamental issues: (1) that there were no relevant data left to be coded and (2) that the procedure did not yield new considerations or lines of discussion.

RESULTS

The literature review made it possible to identify the foundations that support the performance of the Primary Health Care specialist as an integral part of medical professionalization. From this process, as represented below (Figure 3), units of analysis were developed that allowed the main sections of this research to be projected.



Fig. 3. Main units of analysis.

Thematic analysis facilitated the examination of key concepts related to primary care, including its preventive, community-based, and person-centered approach. Additionally, the theoretical principles and models supporting nutrition education's importance in primary care, such as the behavior-focused approach, behavior change theories, and health promotion models, were reviewed.





The study of the relationship between the units of analysis provided a detailed view of the role of the Primary Health Care specialist in nutrition education. The specific responsibilities and competencies of these professionals in relation to nutrition education were examined, including assessing nutritional needs, designing educational interventions, promoting healthy eating behaviors, and monitoring outcomes. These results pointed to the strategies and approaches used by Primary Health Care specialists to facilitate behavior change in relation to food and nutrition.

In short, the contributions of nutrition education in health promotion and disease prevention through the work of the Primary Health Care specialist were examined. From the studies consulted it was possible to explore the scientific evidence that supports the effectiveness of nutrition education in improving eating habits, preventing chronic diseases related to diet, and promoting healthy lifestyles. Additionally, the benefits at the individual and community level of nutrition education in primary health care are highlighted.

Theoretical foundations of the professional performance of the Primary Health Care specialist

In primary health care, the preventive approach is based on the idea that preventing diseases and promoting health is more effective and less costly than treating chronic diseases once they have occurred. Nutrition education plays a key role in this approach, as it focuses on providing people with the knowledge, skills, and resources necessary to make informed decisions about their diet and adopt healthy eating behaviors from an early age.⁽²³⁾

The prevention of diet-related diseases can be encouraged by educating people about the benefits of a balanced diet, the importance of physical activity, and the risks associated with a poor diet. This will contribute to the promotion of a better quality of life, but it must be a direct part of the training curriculum and updated based on the context, but also on prospective needs, as stated by Jones, *et al.*⁽²⁰⁾

On the other hand, the community approach in primary health care recognizes that people's health is influenced by their social, economic, and cultural environment. Primary Health Care specialists work closely with the communities they serve, identifying specific health needs and designing interventions tailored to those needs.

In the context of nutrition education, this involves understanding the social determinants of diet, such as the availability of healthy foods, access to health care services, and the influence of culture and food traditions. By addressing these factors, specialists can develop more effective and culturally appropriate educational strategies that fit the needs and realities of each community, which in turn facilitates the integration of nutrition education into other social programs such as parenting education or attention to diversity.^(24,25,26) In these scenarios where nutrition education is usually the responsibility of other social agents (social workers, community psychologists, or teachers), the primary health care doctor must establish himself as a leader with transformative capacity and generator of synergies.⁽²⁷⁾





Additionally, the behavior-focused approach is based on the idea that changes in people's behavior are essential to achieving positive health outcomes. In the context of nutrition education, this involves not only providing information about the nutritional aspects of foods but also working to develop practical skills and strategies to facilitate the adoption of healthy eating behaviors.⁽²⁸⁾

Behavior changes theories provide a theoretical framework for understanding how people adopt new behaviors and abandon unhealthy ones. Therefore, by adopting a behavior-focused approach, Primary Health Care specialists can address not only the cognitive aspects but also the motivational and emotional factors that influence people's eating habits.⁽²⁹⁾ According to the texts analyzed, this disciplinary link must be intentionally fostered from undergraduate training, in addition to being conceived in study and work strategies at higher levels of training.

Nutrition education is framed in these theoretical principles and plays an essential role in promoting health and preventing diseases through diet. By understanding and applying these theoretical foundations, Primary Health Care specialists can provide more comprehensive and effective care in the field of nutrition education.

Role of the Primary Health Care specialist in nutrition education

The role of the Primary Health Care specialist in nutrition education is characterized by the systemic integration and systematization of knowledge, skills, values, and attitudes related to the three domains of human nutrition. This comprehensive approach allows the specialist to establish connections between the biological, psychological, and social aspects of food and nutrition, with the ultimate goal of preserving the health of the individual, family, and community. Furthermore, this mode of action is based on research and application of the scientific method, both in its clinical and epidemiological aspects, which constitutes a strength to strengthen medical training with an interdisciplinary approach, especially oriented to chronic conditions and mental health care.^(30,31)

The Primary Health Care specialist, in order to insert himself into the objective of nutrition education, must carry out his work in the field of the health/disease process and its care in the human being. This approach implies that the professional must not only focus on treating diet-related diseases but also on their prevention through educational interventions.^(32,33) The educational approach adopted is preventive and developmental, which implies that the specialist must provide information on healthy eating.

In addition, it should also promote skill development and the adoption of long-term healthy eating behaviors. In this sense, the results of Amoore, *et al.*⁽³⁴⁾ demonstrate that the specialist's own participation in intervention programs based on nutrition education contributes to improving their own eating habits and developing solid confidence in their usual professional performance, particularly in care for patients who require specific dietary care. Another example of the importance of including nutrition education in a creative and open way is culinary medicine programs as a teaching medium to strengthen medical preparation on human nutrition issues.⁽³⁵⁾





Consequently, the performance of the Primary Health Care specialist in nutritional education is based on the self-transformation and transformation of the historical, social, and humanistic context in which he or she operates. This implies that the professional is not only limited to passing knowledge but is also involved in understanding the needs and realities of the population he serves.⁽³⁶⁾ Therefore, one of the main difficulties that emerged from the analysis of the source was the attention to the professional identity of the health specialist and what is related to nutrition education as part of his professional assignment. From the Educational Sciences, this contradiction between what the future professional desires and imagines himself to be and what his professional assignment dictates directly has been addressed, which highlights the crucial nature of addressing future projection and professional identity.^(37,38)

In relation to these ideas, it must be considered that the specialist works in collaboration with individuals, families, and communities; hence, adapting educational interventions to their specific context must be an expected performance, but also the result of a vocation for good developed service. In addition, the establishment of relationships of trust and mutual respect is encouraged, which contributes to effective communication and greater adherence to nutritional recommendations.⁽³⁹⁾

In this sense, nutritional education needs to delve into its foundations in Cuba and incorporate the main advances at the international level. The Cuban health system is characterized by its preventive and community approach, prioritizing primary care as a fundamental pillar for health promotion and disease prevention. Furthermore, the linking of agencies between different ministries and social agents contributes to strengthening the approach, so the inclusion of helix and management models in medical education could facilitate a necessary strategic vision in the current context.^(40,41)

In this context, data support that nutrition education plays a crucial role, as it is considered an effective tool to address challenges related to malnutrition and promote healthy eating habits in the population. The Cuban system has implemented comprehensive programs and strategies that include the training of health professionals, community participation, and the incorporation of educational and sustainable approaches at different levels of care.^(10,42,43)

Contribution of nutrition education in health promotion and disease prevention

The data consulted show that nutrition education plays a crucial role in promoting health and preventing diseases around the world. Through the transmission of knowledge, skills, and attitudes related to healthy eating, nutrition education enables people to make informed decisions and adopt eating behaviors that promote their well-being and prevent chronic diseases.^(44,45)

In the field of health promotion, nutrition education has the main objective of promoting healthy lifestyles and empowering people to take control of their own health. By providing information about the principles of a balanced diet, the benefits of eating natural foods and minimizing processed foods, and the importance of regular physical activity, nutrition education specialists help people make conscious and positive decisions about their diet and lifestyle in general.^(46,47)





Regarding disease prevention, the sources consulted indicate that nutrition education plays a crucial role in reducing risk factors associated with chronic non-communicable diseases, such as diabetes, hypertension, and obesity. By promoting healthy eating, we seek to prevent the appearance of these diseases or control their progression in those who already suffer from them.⁽⁴⁸⁾

Additionally, nutrition education can specifically address issues such as food allergies, eating disorders, and nutritional deficiencies, providing information and strategies for their proper management. In all of these cases, nutrition education plays a key role in empowering people with the knowledge and skills necessary to manage these problems appropriately and improve their quality of life.⁽⁴⁹⁾

In Cuba, nutritional education has not been a priority beyond discourse. Although health promotion and disease prevention have various programs, nutritional education does not enjoy the same level of hierarchy, nor has it been effectively included in medical education. The preventive and community approach has yet to allow the implementation of comprehensive programs ranging from training health professionals to involving the community in actively promoting adequate nutrition. Also, this particular goal first needs to meet social and contextual needs related to alimentary security.

Globally, nutrition education varies in terms of scope and focus depending on the cultural, socioeconomic, and health contexts of each country. While some countries have developed comprehensive and structured nutrition education programs, others face challenges in terms of access to healthy foods and educational resources. Furthermore, there are differences in the educational approaches used, ranging from individual and primary healthcare-based interventions to community-level programs and national-level public policies.⁽⁵⁰⁾

System of recommendations for strengthening nutritional education as part of the care offered by the Primary Health Care specialist

- 1. Recognize the need to include nutritional education as the object, objective, and content of medical education.
- 2. Develop a nutrition education curriculum that moves through programs progressively instead of treating it as a subject or discipline topic.
- 3. Design nutritional education programs to incorporate:
 - a) Comprehensive care for specific health and disease processes
 - b) Education and community action as a social and professional assignment.
 - c) Interdisciplinary dialogue is a tool for integration into teams and initiatives with nutritional education as their center.
- 4. Support for the configuration of the professional personal identity of training specialists.





CONCLUSIONS

Throughout this research, the importance of nutrition education in the context of health promotion and disease prevention has been highlighted. The primary health care specialist, being in direct contact with people within the community, has the opportunity to provide information and guidance on healthy eating habits. His professional modus operandi should include continuous training in the field of nutrition, to be updated on the latest research and recommendations. In addition, he must develop effective communication skills, to be able to transmit knowledge about nutrition in a clear and understandable way.

Likewise, the specialist must promote a comprehensive approach to nutrition education, addressing not only aspects related to diet but also considering other factors that can influence health, such as lifestyle, social and cultural environment, and socioeconomic conditions. It is important to highlight that the primary health care specialist, since the conception of the Cuban health system, not only needs an educational role but also a motivating and supportive role, more so if the objective current scenario is taken into consideration. This means that he must encourage patients to adopt positive changes in their eating habits and provide them with the necessary support to overcome obstacles and maintain these changes in the long term.

REFERENCES

- 1. Lucas CJ, McMahon AT, Charlton KE. Developing professional education for about primary healthcare providers nutrition. Austral J Primary Health [Internet]. 2019 [cited 9 Apr 2023]; 25(6):534. DOI: https://doi.org/10.1071/PY19075
- Kraef C, Wood B, Von Philipsborn P, Singh S, Peterson SS, Kallestrup P. Primary health care and nutrition. Bulletin World Health Organization. 2020 [cited 4 Apr 2023]; 98(12):886-93. DOI: <u>https://doi.org/10.2471/BLT.20.251413</u>
- Panichelli J, Middleton A, Kestner L, Rees E. P133 Pivoting to Online Nutrition Education During the COVID-19 Pandemic: Results and Lessons Learned from Cooking Matters. Journal of Nutrition Education and Behavior [Internet]. 2022 [cited 9 Apr 2023]; 54(7):S81-82. DOI: https://doi.org/10.1016/j.jneb.2022.04.174
- Puma JE, Young M, Foerster S, Keller K, Bruno P, Franck K, et al. The SNAP-Ed Evaluation Framework: Nationwide Uptake and Implications for Nutrition Education Practice, Policy, and Research. Journal of Nutrition Education and Behavior [Internet]. 2021 [cited 9 Apr 2023]; 53(4):336–42. DOI: https://doi.org/10.1016/j.jneb.2020.10.015
- Breda J, Castro LSN, Whiting S, Williams J, Jewell J, Engesveen K, *et al.* Towards better nutrition in Europe: Evaluating progress and defining future directions. Food Policy [Internet]. 2020 [cited 4 Apr 2023]; 96:101887. DOI: https://doi.org/10.1016/j.foodpol.2020.101 887
- Shao T, Verma HK, Pande B, Costanzo V, Ye W, Cai Y, et al. Physical Activity and Nutritional Influence on Immune Function: An Important Strategy to Improve Immunity and Health Status. Front. Physiol. [Internet].





2021 [cited 4 Apr 2023]; 12:751374. DOI: https://doi.org/10.3389/fphys.2021.751374

- McCullough K, Whitehead L, Bayes S, Williams A, Cope V. The delivery of Primary Health Care in remote communities: A Grounded Theory study of the perspective of nurses. International Journal of Nursing Studies [Internet]. 2020 [cited 11 Apr 2023]; 102:103474. DOI: https://doi.org/10.1016/J.IJNURSTU.2019.1 03474
- Lauriola P, Martín-Olmedo P, Leonardi GS, Bouland C, Verheij R, Dückers MLA, *et al*. On the importance of primary and community healthcare in relation to global health and environmental threats: lessons from the COVID-19 crisis. BMJ Glob Health [Internet]. 2021 [cited 11 Apr 2023]; 6(3):e004111. DOI: <u>https://doi.org/10.1136/bmjgh-2020-004111</u>
- Borroto Mederos Y, Leyva Haza J, Guerra Véliz Y. La educación alimentaria en el proceso educativo: una temática de interés multidisciplinario salud-educación. Edumecentro [Internet]. 2022 [cited 11 Apr 2023]; 14. Available at: <u>http://scielo.sld.cu/scielo.php?pid=S2077-28742022000100112&script=sci arttext</u>
- 10.Peña-Gonzalez M, Sánchez-Vázquez Y, Doce-Castillo BL. Actualidad en la educación nutricional en la formación del profesional de la salud. Correo Cent. Méd [Internet]. 2023 [cited 4 Apr 2023]; 28. Available at: <u>https://revcocmed.sld.cu/index.php/cocmed</u> /article/view/4974
- 11.Lima Rodríguez AL, Hernández Barrenechea AL, Martínez González LE, Ceijas AS. Estudio exploratorio de la educación alimentaria y nutricional en la formación del profesor de Biología. Atenas [Internet]. 2021 [cited 11 Apr 2023]; 1(53):125–38. Available at: https://atenas.umcc.cu/index.php/atenas/ar ticle/view/92

Universidad de Ciencias Médicas de Guantánamo

- 12.Shi W, Ghisi GLM, Zhang L, Hyun K, Pakosh M, Gallagher R. Systematic review, meta-analysis and meta-regression to determine the effects of patient education on health behaviour change in adults diagnosed with coronary heart disease. Journal of Clinical Nursing [Internet]. 2023 [cited 6 Apr 2023]; 32(15–16):5300–27. DOI: https://doi.org/10.1111/jocn.16519
- 13.Nordhagen S, Lambertini E, DeWaal CS, McClafferty B, Neufeld LM. Integrating nutrition and food safety in food systems policy and programming. Global Food Security [Internet]. 2022 [cited 6 Apr 2023]; 32:100593. DOI:

https://doi.org/10.1016/j.gfs.2021.100593

- 14.Penne T, Goedemé T. Can low-income households afford a healthy diet? Insufficient income as a driver of food insecurity in Europe. Food Policy [Internet]. 2021 [cited 8 Apr 2023]; 99:101978. DOI: https://doi.org/10.1016/j.foodpol.2020.101 978
- 15.Ntambara J, Chu M. The risk to child nutrition during and after COVID-19 pandemic: what to expect and how to respond. Public Health Nutr. [Internet]. 2021 [cited 11 Apr 2023]; 24(11):3530–6. DOI: https://doi.org/10.1017/S136898002100161 0
- 16.De Mello AV, Lopes Pereira J, Barco Leme ACB, Goldbaum M, Galvao Cesar CL, Fisberg RM. Social determinants, lifestyle and diet quality: a population-based study from the 2015 Health Survey of São Paulo, Brazil. Public Health Nutr. [Internet]. 2020 [cited 4 Apr 2023]; 23(10):1766-77. DOI: https://doi.org/10.1017/S136898001900348 <u>3</u>
- 17.Moitra P, Madan J, Verma P. Impact of a behaviourally focused nutrition education intervention on attitudes and practices related to eating habits and activity levels in Indian adolescents. Public Health Nutr.





[Internet]. 2021 [cited 8 Apr 2023]; 24(9):2715–26. DOI: https://doi.org/10.1017/S136898002100020 <u>3</u>

- 18.Crowley J, Ball L, Hiddink GJ. Nutrition in medical education: a systematic review. The Lancet Planetary Health [Internet]. 2019 [cited 11 Apr 2023]; 3(9):e379–89. DOI: <u>https://doi.org/10.1016/S2542-</u> 5196(19)30171-8
- 19.Macaninch E, Buckner L, Amin P, Broadley I, Crocombe D, Herath D, *et al.* Time for nutrition in medical education. BMJ Nutr. Prev. Health [Internet]. 2020 [cited 8 Apr 2023]; 3(1):40–8. DOI: <u>https://doi.org/10.1136/bmjnph-2019-</u>000049
- 20.Jones G, Macaninch E, Mellor DD, Spiro A, Martyn K, Butler T, *et al.* Putting nutrition education on the table: development of a curriculum to meet future doctors' needs. British Journal of Nutrition [Internet]. 2023 [cited 22 Apr 2023]; 129(6):1000–8. DOI: https://doi.org/10.1017/S000711452200163 5
- 21.Von Wedel P, Hagist C. Economic Value of Data and Analytics for Health Care Providers: Hermeneutic Systematic Literature Review.
 J. Med. Internet Res. [Internet]. 2020 [cited 22 Apr 2023]; 22(11):e23315. DOI: https://doi.org/10.2196/23315
- 22.Hughes G, Shaw SE, Greenhalgh T. Rethinking Integrated Care: A Systematic Hermeneutic Review of the Literature on Integrated Care Strategies and Concepts. The Milbank Quarterly [Internet]. 2020 [cited 11 Apr 2023]; 98(2):446–92. DOI: https://doi.org/10.1111/1468-0009.12459
- 23.Gato-Moreno M, Martos-Lirio MF, Leiva-Gea I, Bernal-López MR, Vegas-Toro F, Fernández-Tenreiro MC, et al. Early Nutritional Education in the Prevention of Childhood Obesity. Int. J Environ. Res. Public Health [Internet]. 2021 [cited 4 Apr 2023];

18(12):6569.

DOI:

https://doi.org/10.3390/ijerph18126569

Universidad de Ciencias Médicas de Guantánamo

24.Martinez-Lacoba R, Pardo-Garcia I, Amo-Saus E, Escribano-Sotos F. Social determinants of food group consumption based on Mediterranean diet pyramid: A cross-sectional study of university students. Schnettler B, editor. PLoS ONE [Internet]. 2020 [cited 11 Apr 2023]; 15(1):e0227620. DOI:

https://doi.org/10.1371/journal.pone.02276 20

- 25.Hossain SJ, Rahman SM, Fisher J, Rahman A, Tofail F, Hamadani JD. Effect of a parenting and nutrition education programme on development and growth of children using a safety-net platform in social urban Bangladesh: a cluster randomized controlled trial. The Lancet Regional Health - Southeast Asia [Internet]. 2024 [cited 11 Apr 2024]; 25:100388. DOI: https://doi.org/10.1016/j.lansea.2024.10038 8
- 26.Jamaluddine Z, Choufani J, Masterson AR, Hoteit R, Sahyoun NR, Ghattas H. A Community-Based School Nutrition Intervention Improves Diet Diversity and School Attendance in Palestinian Refugee Schoolchildren in Lebanon. Curr. Dev. Nutr. [Internet]. 2020 [cited 23 Apr 2023]; 4(11):nzaa164. DOI: https://doi.org/10.1093/cdp/pzaa164

https://doi.org/10.1093/cdn/nzaa164

- 27.Crowley J, Ball L, Hiddink GJ. Nutrition care by primary-care physicians: advancing our understanding using the COM-B framework. Public Health Nutr. [Internet]. 2020 [cited Apr 2023]; 23(1):41–52. DOI: <u>https://doi.org/10.1017/S136898001900314</u> <u>8</u>
- 28.Lai IJ, Chang LC, Lee CK, Liao LL. Nutrition Literacy Mediates the Relationships between Multi-Level Factors and College Students' Healthy Eating Behavior: Evidence from a Cross-Sectional Study. Nutrients [Internet].





2021 [cited 8 Apr 2023]; 13(10):3451. DOI: https://doi.org/10.3390/nu13103451

- 29.Rigby RR, Mitchell LJ, Hamilton K, Williams LT. The Use of Behavior Change Theories in Dietetics Practice in Primary Health Care: A Systematic Review of Randomized Controlled Trials. Journal of the Academy of Nutrition and Dietetics [Internet]. 2020 [cited 11 Apr 2023]; 120(7):1172–97. DOI: https://doi.org/10.1016/j.jand.2020.03.019
- 30.Carter C, Harnett JE, Krass I, Gelissen IC. A review of primary healthcare practitioners' views about nutrition: implications for medical education. International Journal of Medical Education [Internet]. 2022 [cited 6 Apr 2023]; 13:124–37. DOI: https://doi.org/10.5116/ijme.6271.3aa2
- 31. Joudyian N, Doshmangir L, Mahdavi M, Tabrizi JS, Gordeev VS. Public-private partnerships in primary health care: a scoping review. BMC Health Services Research [Internet]. Dic 2021 [cited 23 Apr 2023]; 21(1):4. DOI: https://doi.org/10.1186/s12913-020-05979-9
- 32.Van Horn L, Lenders CM, Pratt CA, Beech B, Carney PA, Dietz W, *et al.* Advancing Nutrition Education, Training, and Research for Medical Students, Residents, Fellows, Attending Physicians, and Other Clinicians: Building Competencies and Interdisciplinary Coordination. Advances in Nutrition [Internet]. 2019 [cited 8 Apr 2023]; 10(6):1181–200. DOI: https://doi.org/10.1093/advances/nmz083
- 33.Cotton W, Dudley D, Peralta L, Werkhoven T. The effect of teacher-delivered nutrition education programs on elementary-aged students: An updated systematic review and meta-analysis. Preventive Medicine Reports [Internet]. 2020 [cited 6 Apr 2023]; 20:101178. DOI: https://doi.org/10.1016/j.pmedr.2020.1011

https://doi.org/10.1016/j.pmedr.2020.1011 78 Universidad de Ciencias Médicas de Guantánamo

34.Amoore BY, Gaa PK, Amalba A, Mogre V. Nutrition education intervention improves medical students' dietary habits and their competency and self-efficacy in providing nutrition care: A pre, post and follow-up quasi-experimental study. Front. Nutr. [Internet]. 2023 [cited 11 Apr 2023]; 10:1063316. DOI:

https://doi.org/10.3389/fnut.2023.1063316

- 35.Tan J, Atamanchuk L, Rao T, Sato K, Crowley J, Ball L. Exploring culinary medicine as a promising method of nutritional education in medical school: a scoping review. BMC Medical Education [Internet]. 2022 [cited 6 Apr 2023]; 22(1):441. DOI: <u>https://doi.org/10.1186/s12909-022-03449-</u> <u>W</u>
- 36.Tramontt CR, Jaime PC. Improving knowledge, self-efficacy and collective efficacy regarding the Brazilian dietary guidelines in primary health care professionals: a community controlled trial. BMC Family Practice [Internet]. 2020 [cited 6 Apr 2023]; 21(1):214. DOI: https://doi.org/10.1186/s12875-020-01245-<u>3</u>
- 37.Pérez Gamboa AJ, García Acevedo Y, García Batán J, Raga Aguilar LM. La configuración de proyectos de vida desarrolladores: Un programa para su atención psicopedagógica. Act. Inv. en Educ. [Internet]. 2023 [cited 21 Apr 2023]; 23(1):1–35. DOI: http://dx.doi.org/10.15517/aie.v23i1.50678
- 38.Rodríguez Torres E, Dávila Cisneros JD, Gómez Cano CA. La formación para la configuración de proyectos de vida: una experiencia mediante situaciones de enseñanza-aprendizaje. Varona [Internet]. 2024 [cited 4 Apr 2023]; (79). Available at: <u>http://scielo.sld.cu/scielo.php?pid=S1992-</u> 82382024000100007&script=sci abstract
- 39.Keshani P, Hossein Kaveh M, Faghih S, SalehiM. Improving diet quality among adolescents, using health belief model in a





collaborative learning context: a randomized field trial study. Health Education Research [Internet]. 2019 [cited 11 Apr 2023]; 34(3):279–88. DOI: https://doi.org/10.1093/her/cyz009

- 40.Zakaria H, Kamarudin D, Fauzi MA, Wider W. Mapping the helix model of innovation influence on education: A bibliometric review. Front. Educ. [Internet]. 2023 [cited 11 Apr 2023]; 8:1142502. DOI: https://doi.org/10.3389/feduc.2023.114250 2
- 41.Gonzalo JD, Dekhtyar M, Caverzagie KJ, Grant BK, Herrine SK, Nussbaum AM, *et al.* The triple helix of clinical, research, and education missions in academic health centers: A qualitative study of diverse stakeholder perspectives. Learn. Health Syst. [Internet]. 2021 [cited 8 Apr 2023]; 5(4):e10250. DOI:

https://doi.org/10.1002/lrh2.10250

- 42.Díaz Pérez M, Triana Velázquez Y, Brizuela Chirino P, Rodríguez Font RJ, Giráldez Reyes R, Blanco Borrego J. Soberanía Alimentaria y Educación Nutricional desde la ciencia de la sostenibilidad: Observatorio SAEN+ C Pinar. Univ. Soc. [Internet]. 2021 [cited 8 Apr 2023]; 13(5):9–19. Available at: <u>http://scielo.sld.cu/scielo.php?pid=S2218-36202021000500009&script=sci arttext&tln</u> g=en
- 43.Soto López Y, Borges García M. Estrategia de fortalecimiento del derecho a la alimentación en la soberanía alimentaria y educación nutricional. Univ. Soc. [Internet]. 2023 [cited 8 Apr 2023]; 15(S3):409–21. Available at: <u>https://rus.ucf.edu.cu/index.php/rus/article/</u> view/4254
- 44.Yoder AD, Proaño GV, Handu D. Retail Nutrition Programs and Outcomes: An Evidence Analysis Center Scoping Review. Journal of the Academy of Nutrition and Dietetics [Internet]. 2021 [cited 11 Apr

Universidad de Ciencias Médicas de Guantánamo

2023]; 121(9):1866-1880.e4. DOI: https://doi.org/10.1016/j.jand.2020.08.080

45.Di Renzo L, Gualtieri P, Romano L, Marrone G, Noce A, Pujia A, *et al.* Role of Personalized Nutrition in Chronic-Degenerative Diseases. Nutrients [Internet]. 2019 [cited 8 Apr 2023]; 11(8):1707. DOI:

https://doi.org/10.3390/nu11081707

46.Vasconcelos C, Almeida A, Cabral M, Ramos E, Mendes R. The Impact of a Community-Based Food Education Program on Nutrition-Related Knowledge in Middle-Aged and Older Patients with Type 2 Diabetes: Results of a Pilot Randomized Controlled Trial. International Int. J. Environ. Res. Public Health [Internet]. 2019 [cited 11 Apr 2023]; 16(13):2403. DOI:

https://doi.org/10.3390/ijerph16132403

47.Abad-Segura González-Zamar Ε, MD, Gómez-Galán J, Bernal-Bravo C. Management Accounting for Healthy Nutrition Education: Meta-Analysis. Nutrients [Internet]. 2020 [cited 6 Apr 2023]; 12(12):3715. DOI: https://doi.org/10.3390/nu12123715

48.Franzago M, Santurbano D, Vitacolonna E, Stuppia L. Genes and Diet in the Prevention of Chronic Diseases in Future Generations. Int. J. Mol. Sci. [Internet]. 2020 [cited 6 Apr 2023]; 21(7):2633. DOI: https://doi.org/10.3390/ijms21072633

49.D'Auria E, Pendezza E, Zuccotti GV. Personalized Nutrition in Food Allergy: Tips for Clinical Practice. Front. Pediatr. [Internet]. 2020 [cited 11 Apr 2023]; 8:113. DOI:

https://doi.org/10.3389/fped.2020.00113

50.Dornhoff M, Hörnschemeyer A, Fiebelkorn F. Students' Conceptions of Sustainable Nutrition. Sustainability [Internet]. 2020 [cited 8 Apr 2023]; 12(13):5242. DOI: https://doi.org/10.3390/su12135242





Conflict of Interest:

The authors declare that there is no conflict of interest.

Authors contributions:

Mirian Belkis Nápoles Valdés: conceptualization, data curation, formal analysis, investigation, methodology, project administration, supervision, writing – original draft, writing – review and editing.

Felipe Machuca-Contreras: conceptualization, data curation, formal analysis, methodology, writing – original draft.

Alfredo Puican Carreño: conceptualization, investigation, methodology, writing – original draft, writing – review and editing. *Juan Carlos Granados Barreto:* conceptualization, methodology, writing – original draft.

Funding:

The authors received no funding for the development of this research.



