

ORIGINAL ARTICLE

Knowledge of health professionals about vegetarian diets: an integrative review

Conhecimento sobre dietas vegetarianas por profissionais da saúde: revisão integrativa

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KEYWORDS

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ABSTRACT

Objective: To assess studies on the knowledge of health professionals regarding vegetarian diets. **Methods:** This integrative review was conducted from November to December 2020 and updated in January 2022 in 5 databases and the gray literature. Two investigators performed the article selection. The inclusion criteria were scientific articles with any study design that addressed the intended topic with no date or language limitation. **Results:** Eleven studies were included. The main common finding was that health professionals, except dietitians, were not satisfied with the available nutritional information in general, not only regarding vegetarian diets. Despite this gap, half of the studies showed a positive view by professionals concerning the vegetarian diet. **Conclusions:** Many professionals do not feel confident about encouraging a vegetarian diet since they do not know the details of its benefits and risks.

PALAVRAS-CHAVE

Conhecimento
Dietas vegetarianas
Profissionais da saúde

RESUMO

Objetivo: A analisar estudos sobre o conhecimento dos profissionais da saúde sobre a alimentação vegetariana. **Métodos:** revisão integrativa realizada de novembro a dezembro de 2020 e atualizada em janeiro de 2022. A busca foi realizada em 5 bases de dados e na literatura cinza, as etapas de seleção foram realizadas por dois pesquisadores. Os critérios de inclusão foram: ser um artigo científico de qualquer desenho de estudo que avaliasse o tema pretendido, em qualquer língua e sem limite de data de publicação. **Resultados:** Foram incluídos 11 estudos, o principal achado em comum foi que os profissionais de saúde, que não nutricionistas, não estão satisfeitos com a quantidade de conteúdo nutricional que receberam, não só sobre a alimentação vegetariana, no geral. Apesar dessa lacuna, metade dos estudos mostrou uma visão positiva dos profissionais em relação à alimentação vegetariana. **Conclusão:** Apesar da visão positiva, muitos profissionais não se sentem aptos a estimular uma alimentação vegetariana por não conhecerem detalhadamente seus benefícios e riscos.

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INTRODUCTION

Despite the evidence on the benefits of vegetarian meals, many prejudices are still associated with this dietary pattern. The Academy of Nutrition and Dietetics has developed an opinion, based on the scientific evidence accrued recently on the subject, ensuring that vegetarian food is safe and healthy at all stages of life, including childhood, pregnancy, and lactation, as long as it is well planned - just like any diet¹. Several studies have shown that, in addition to being safe, vegetarian food can be an ally in the treatment and prevention of different diseases, such as cardiovascular disease, diabetes, and cancer^{2,3}.

In addition to health benefits, this type of diet, based on fresh and minimally processed foods, is beneficial to planetary health and is closer to what we call a sustainable diet; that is, it is capable of feeding the entire population, causing the least possible harm to the planet^{4,5}. Therefore, it may be necessary that health professionals, in addition to supporting those who have already chosen a vegetarian diet and providing important information, encourage a reduction in the consumption of animal foods.

However, there is a gap in transmitting this knowledge to the general population. This situation may be due to the lack of nutrition content in medicine and nursing teaching courses⁶. In Brazil, these professionals are the first to contact the patient, especially those with chronic diseases (diabetes mellitus, hypertension), as they are at the front line of the primary government healthcare *Sistema Único de Saúde* (SUS, Unified Health System). Therefore, these professionals are responsible for providing basic information about nutrition that is crucial in treating these diseases. According to current evidence³, one of these guidelines encourages a reduction in animal product consumption, in addition to the other recommendations outlined in the Food Guide for the Brazilian Population⁷ and in other specific manuals for each of these diseases, such as the Cardioprotective Diet Manual⁸.

Additionally, the number of vegetarianism fans has increased worldwide recently, as well as the number of products in supermarkets aimed at this public. Health professionals must accept individual choices - when not harmful to health or society - and know how to manage food and treatments, if necessary, complying with this option⁹. However, it still lacks evidence on how prepared those professionals feel when giving orientations about vegetarian diets.

This paper aimed to identify and review studies on the knowledge of health professionals about the vegetarian diet. Due to the nature of published studies on this topic, the best approach would be an integrative review.

METHODS

This integrative review was conducted from November to December 2020 and updated by January 2022. This review was based on the Cochrane Systematic Review Manual¹⁰, adapted to integrative reviews¹¹. The search question was "What are the knowledge, beliefs,

and/or attitudes of health professionals about vegetarian diets?". A protocol was written before the research but not registered. It is available as supplementary material (Supplement 1; in Portuguese).

Seven databases - MEDLINE, PubMed Central, OldMedline Science Direct, Web of Science, and Embase - and gray literature were used in the research. Scientific studies on the knowledge, beliefs, and attitudes of health professionals about the reduction or non-consumption of meat were investigated. The terms used in the search strategy were (*doctor* OR nutritionist* OR "health professional*" OR * "health workforce" AND dietitian* OR physician**) AND (*belief* OR opinion* OR conviction* OR judgment OR say OR advice OR knowledge OR attitude*) AND (*"meat consumption" OR "dairy consumption" OR vegetarian* OR vegan* OR "eat* meat" OR meat OR dairy OR "meat reduction" OR "plant-based diet"*).

Inclusion criteria were scientific articles - congress abstracts or commentary were excluded with any study design - descriptive, correlational, causal-comparative/quasi-experimental, and experimental research that addressed the intended topic, with no limit of date, in Portuguese, English, or Spanish. It was excluded if the text was not available in full, even after contacting the authors.

After excluding duplicates, the study selection steps were performed by reading the title and abstract, followed by confirmation of eligibility by reading the articles in full. Two investigators carried out both stages (AAA and JGSTS); any selection and eligibility conflicts were settled by consensus. The study selection step was performed using the Rayyan tool¹² and a Microsoft Excel® spreadsheet validated by the authors before starting the extraction step. The data extraction was performed by one investigator (AAA) who collected the following data: main authors, year of publication, journal, objective, type of study, institution and country where the study was developed, when the study was conducted, funding and conflict of interest. The data were summarized on the basis of the essential information brought by the study, paying attention not to change the meaning of the article.

RESULTS

A total of 1,423 articles were found, of which 361 were duplicates; the remaining 1,062 articles were selected by title and abstract. After reading the title and abstract, 40 articles were selected for a full reading. Of these, 11 studies were included for review. The other 29 were excluded for not being scientific articles (n = 4 congress abstracts, book chapters), not being available in full even after contacting the authors (n = 5) or did not assess or report the knowledge/influence of health professionals on the reduction of animal food consumption (n = 20) (Figure 1). The list of excluded studies with reasons is available as supplementary material (Supplement 2).

The 11 articles included were published from 2007 to 2021. Five studies were conducted in the United States, five in European countries, one in New Zealand, and one in Canada. Table 1 summarizes the findings of

the 11 included studies. Most were cross-sectional (n = 10), and one was longitudinal. No clinical trials were found. However, data such as funding support and

conflict of interest were also collected to guarantee the reliability of the results. All studies were peer-reviewed.

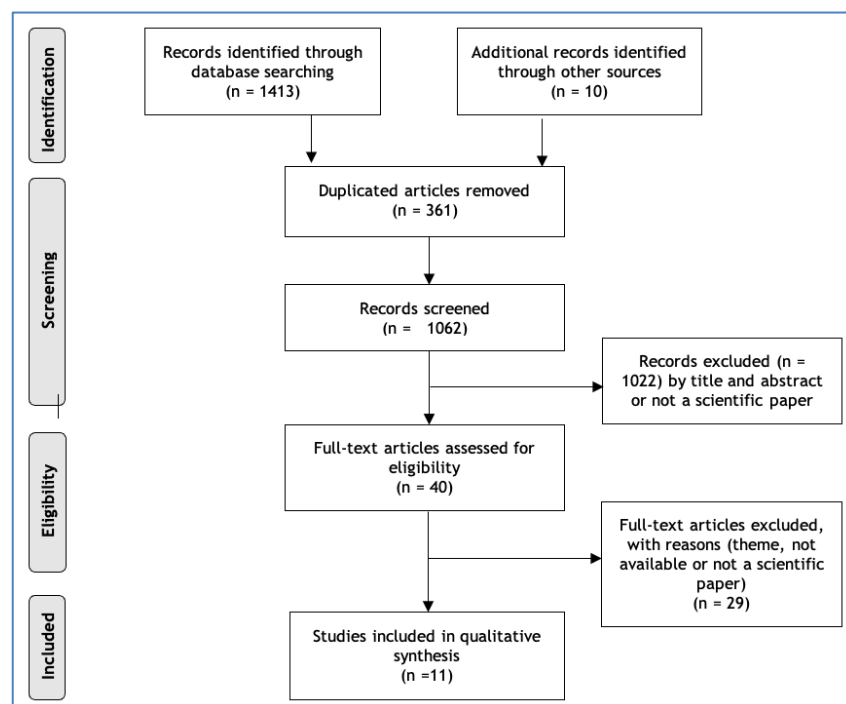


Figure 1 - Flowchart of article selection (adapted from PRISMA³²).

Two studies^{13,14} evaluated healthcare students and non-graduated professionals but were included as their findings were considered essential for the discussion.

Most included studies were quantitative¹⁴⁻²². The only one with a qualitative-quantitative approach was McHugh et al.²³. Spencer et al.¹³ had a longitudinal approach since the questionnaire was applied in 3 different years.

Ten studies were conducted with physicians or medical students^{13,14,17-19,21-23}. Four^{15,21-23} also included other health professionals such as nurses, osteopaths, midwives, dentists, and dieticians. One²⁰ included only dietitians or nutritionists, and another¹⁶ was conducted with directors of the US dietetics programs, who were supposed to be nutritionists/dieticians, although the aim was to investigate the curricular practices of the courses regarding vegetarian diets.

The two studies that analyzed only medical students^{13,14} found no relationship between being a vegetarian and nutritional counseling. Spencer et al.¹³ observed that vegetarian students were no longer likely to provide nutritional advice to their patients, and Sanne and Bjørke-Monsen¹⁴ found no relationship between being a vegetarian and having a more nutritional knowledge about this type of diet. Nonetheless, the other study²¹ that included students and professionals found an association between the type of diet and recommending dairy or plant-based alternatives. Professionals or students who chose a plant-based diet tended to recommend alternatives more often.

Three articles²⁰⁻²² included nutritionists or

dietitians in the sample, and they have three different designs. Asher et al.²⁰ analyzed dietitians' perspectives regarding the new Canadian guideline, which includes more open recommendations on plant-based protein alternatives. Here, the professionals seemed to have appreciated the change and implemented the new recommendations. Clark et al.²¹ showed that individual food choices might impact the recommendations of health professionals, including nutritionists; in other words, vegetarian nutritionists tend to recommend plant-based alternatives more often than omnivorous professionals. Finally, Meulenbroeks et al.²², who focused on recommendations and support for plant-based diets for pregnant women, showed that nutritionists did not feel prepared or wise enough to counsel pregnant women about their diet.

The main common finding among studies was that the health professionals assessed - doctors, nurses, osteopaths, dentists, and midwives - were not satisfied with the amount of nutritional information they received, whether in college, at home, or work. Additionally, studies that have assessed the knowledge about nutrients^{14,17,23} concluded that there was a knowledge gap in this aspect of nutrition.

Despite this gap, half of the studies also showed a positive view of health professionals about vegetarian diet^{14,17,18,23}, as it was associated with a beneficial practice for health and benefits for the environment¹⁶. However, many professionals do not feel able to encourage this type of diet because they do not know in detail its benefits and risks.

Table 1 – Summary of studies included in the review with characterization and main findings.

Author, year, country	Design	Population and sample	Objective	Methodology	Main findings
Spencer, et al. ¹³ , 2007, USA	Quantitative longitudinal	N = 857 Medical students in three stages: first-year students reception, internship orientation, and senior year.	To determine the prevalence and correlates of self-identification of medical students as vegetarians	A questionnaire was carried out three times in different years: in the first-year orientation (1999), during ward guidance, and the last year (2003).	Vegetarian students were slightly more likely to believe in the relevance of nutritional counseling; however, they were no longer likely to provide nutritional counseling to patients.
Bettinelli et al. ¹⁵ , 2019, Italy	Cross-sectional, quantitative	N = 418 90.2% female; 9.8% male Nurses, pediatric nurses, midwives, staff nurses, and health support professionals were included. Age: >50y: 31.1%; 40-49 y: 30.7%; 30-39 y: 25%; < 30 y: 13.2%	To check the knowledge of health professionals about the adoption of vegetarian diets from pregnancy to adolescence	A questionnaire consisting of 36 multiple-choice questions: the sociodemographic and professional profile, the definition of a vegetarian/vegan diet, knowledge about the risks and benefits associated with the use of such diets, knowledge about specific nutrients and the adoption of a vegetarian diet throughout the different stages of the life cycle, including pregnancy, childhood, and adolescence.	Health professionals lack complete and exhaustive knowledge about vegetarian diets and lack information about the health outcomes of adopting a vegetarian diet during different stages of the life cycle and nutrients.
Hawkins et al. ¹⁶ , 2019, USA	Cross-sectional, quantitative	N = 205 Directors of Dietetic Training Programs	Investigate Curriculum Practices in Accredited Dietetic Training Programs in the United States (USA)	A 37-item questionnaire including (1) the prevalence and perceived importance of vegetarian and vegan nutrition and whether program directors link vegetarian and vegan diets to climate change mitigation and resource conservation	More than 51% of respondents say that vegetarian nutrition is taught. Approximately 90% of program directors rate students' attitudes toward vegetarian diets as highly acceptable (36%) and acceptable (53%). 16% of respondents perceive barriers to addressing vegetarian nutrition in their relevant programs, with 67% citing time restrictions.
McHugh, et al. ²³ , 2019, New Zealand	Cross-sectional, quantitative	N = 41 Doctors, general practitioners, nurses, pharmacists, osteopaths	To investigate whether health professionals in Tairāwhiti have sufficient nutrition education for their roles	Two methods were used, a hard copy questionnaire left in medical offices, pharmacies, and hospitals and a focus group with 4	There was a consensus among participants that diets high in processed meats were unhealthy and that a high intake of vegetables was healthy. Vegetarian, vegan, and plant-based diets are generally

Table 1 – Summary of studies included in the review with characterization and main findings (cont.).

Author, year, country	Design	Population and sample	Objective	Methodology	Main findings
			in health education and promotion and whether their nutritional beliefs were consistent with current literature. Of particular interest was to gain views on the harms, benefits, and potential barriers of following plant-based diets.	professionals who agreed to participate.	considered beneficial, and a meat-rich diet is harmful. Participants believed that following a plant-based diet would generally be complicated but improve the perception of quality of life and benefit health. Almost half of the practitioners did not think they had adequate nutritional knowledge.
Sanne and BJORKE-MONSEN ¹⁴ , 2020, Norway	Cross-sectional, quantitative	N = 394 Medical students 313 females 81 males Average age - 23.5 years	Testing nutritional knowledge among vegetarian and omnivore medical students.	An online questionnaire containing 36 items on demographics, past and current diet, use of micronutrient supplements, tobacco and alcohol, and nutritional knowledge.	90% of the students who responded to the survey were omnivores, and only 10% were vegetarians. More vegetarian students (44% x 13%) considered the vegetarian diet healthier than omnivorous. Nutritional knowledge regarding vegetarian and vegan diets was not satisfactory among Norwegian medical students and did not differ according to students' diets.
Krause and WILLIAMS ¹⁷ , 2020, USA	Cross-sectional, quantitative	N = 64 12 residents, 6 scholarship holders, 46 attending physicians, and 9 were others (Ph.D., PharmD, RD, Scholarship Coordinator, Nurse) 58% female Age: 18-24: 2%; 25-34: 33%; 45-54: 9%; 55-64: 22%; 65-74: 3%	To determine the medical community's knowledge of plant-based nutrition and assess whether participants would be willing to adopt or recommend this diet to patients	20-item questionnaire on plant-based nutrition.	Most participants (90%) correctly categorized vegan and vegetarian diets. Participants were confused about whether they would recommend herbal feeding to their current/future patients, with 33% saying yes and 51% saying maybe. Most respondents correctly identified different aspects of plant-based nutrition. The majority (83%) agreed that a plant-based diet is safe and can reduce an individual's risk of developing cardiovascular disease, type 2 diabetes, and some cancers.
Harkin et al. ¹⁸ , 2020, USA	Cross-sectional, quantitative study	N = 236 140 general practitioners; 96 cardiologists. 52.8% male	Assess practical knowledge as well as their personal views as internists and cardiologists regarding nutrition for CVD	An anonymous, online questionnaire was distributed to cardiologists, physicians, and resident physicians containing 26 true and false questions. The questions were	Only 13.5% of physicians strongly agreed that they were adequately trained to discuss nutrition with their patients. 85%-95% would recommend a plant-based diet - after the educational intervention. This is in contrast to only 14.3% of those in the

Table 1 – Summary of studies included in the review with characterization and main findings (cont.).

Author, year, country	Design	Population and sample	Objective	Methodology	Main findings
		Average age: 41 ± 12.4 y	prevention to develop a potential intervention to address this deficit	about guideline-based nutritional interventions (e.g., better sources of monounsaturated fats or which fish are considered "Oily fish") to determine whether respondents could make recommendations that were more relevant to the patient.	original survey who reported that they would prescribe a vegan or vegetarian diet. The biggest obstacles to incorporating nutritional counseling into medical practice were time constraints and a lack of educational resources. The survey results identified an evident deficiency in medical education.
Hamiel et al. ¹⁹ , 2020, Israel	Cross-sectional, quantitative study	N = 270 pediatricians 60.4% female Average age 42.2 ± 11.4 y	Assess nutritional knowledge, familiarity with guidelines, and pediatricians' attitudes toward vegetarian diets.	A previously used and tested questionnaire with 18 questions about knowledge, 6 about attitudes, and 6 multiple choice questions about consultations with other professionals. Sociodemographic and food choice data were also collected.	The study shows substantial gaps in knowledge and unfavorable attitudes toward vegetarian diets among pediatricians in Israel. The discoveries are a call to action to enrich the nutrition curriculum during medical school, residency, and continuing education courses for physicians and specifically for pediatricians.
Asher, Doucet and Luke ²⁰ , 2020, Canada	Cross-sectional, quantitative study	N = 403 dietitians 96.1% female Middle age 38.3 ± 11.6	Examine Canadian dietitians' attitudes and behavior towards the guide's expanded plant-based recommendations.	Open questions about the use and knowledge of the new food guide and the new recommendations for plant-based protein.	Most (58.7%) nutritionists encourage patients/clients to choose plant-based protein foods more often under the new guide compared to the old guide. Canadian dietitians generally look favorably upon the new plant-based recommendations and have adjusted their nutrition counseling in response.
Clark, Pope, Belarmino ²¹ , 2021, USA	Cross-sectional, quantitative study	N = 276 Health professionals; 55 students 91.5% female Most between 18-34 and 35-53 years.	Examine the relationship between healthcare professionals' personal food preferences and their professional nutrition advice on dairy and plant-based dairy alternatives.	Online questionnaire to measure professionals' personal food choices and their recommendations on dairy and plant-based alternatives. They included questions on age, gender, race, state, and profession. Respondents were asked if they would recommend a dairy to a patient and if they	Most health professionals sampled would recommend both dairy and dairy alternative products to patients, although their health reasons for recommending each product differed. The findings indicate the personal milk preferences and dietary patterns of US health professionals may be associated with willingness to recommend dairy and PB dairy alternatives to patients

Table 1 – Summary of studies included in the review with characterization and main findings (cont.).

Author, year, country	Design	Population and sample	Objective	Methodology	Main findings
Meulenbroek et al. ²² , 2021, The Netherlands	Cross-sectional, quantitative study	N =121 midwives 179 obstetricians 111 nutritionists 90.9% female Majority between 18 and 40 years old	Assess self-reported knowledge and advice Dutch obstetric caregivers and nutritionists give when treating pregnant women on a plant-based diet.	would recommend plant-based alternatives and why. Two different questionnaires: obstetricians and midwives were asked about age, gender, whether they ask pregnant women about food preferences, what they advise women on a strict plant-based diet, whether they have had any nutritional education, and who should be responsible for providing nutritional advice. Moreover, dietitians were asked about their education on the strict plant-based diet during pregnancy and whether they felt competent to advise these women, for example.	Most midwives (66.1%) and obstetricians (75.4%) considered their knowledge insufficient to guide pregnant women about a plant-based diet. Additionally, 68.6% of midwives and 93.9% of obstetricians indicated that their nutrition education was insufficient or non-existent. Most nutritionists (96.4%) indicated that their formal training did not cover a strict plant-based diet during pregnancy. Of all nutritionists, 38.7% indicated they were knowledgeable enough to advise women on a strict plant-based diet during pregnancy.

DISCUSSION

The positive perspective of vegetarian food is consistent with what is found in the literature: generally, this type of food is considered healthier than traditional food²⁴.

The main conclusion of the different studies is that the nutrition content, in general, is insufficient in health teaching courses. Several studies have addressed this issue and tried to explain why this limitation exists. Mogre et al.²⁵ give clues about the barriers to doctors' nutrition education. Their included professionals perceived a poor translation of nutrition science into clinical practice, that nutrition is not their responsibility, a lack of knowledge of teachers in nutrition, weak collaboration between nutritionists and physicians, poor integration of the curriculum content, and excess of content in the medical course grid, which generates a limitation of time and models of nutritional care teaching.

Another issue repeated in the studies is a greater nutrition curriculum for other health professions, such as medicine and nursing, but there is no solid evidence of whether the nutrition professionals have in-depth knowledge about vegetarian eating. In this research, we found that nutritionists did not know enough about plant-based pregnancy, despite the favorable evidence on this topic²⁶. Hawkins et al.¹⁶ help us understand a little, as some respondents (16%) reported barriers in approaching plant-based nutrition in nutrition courses, the main being the time that this content is addressed.

The three primary non-religious reasons that lead to vegetarianism are animal ethics, environmental concern, and health^{27,28}. Even though health is among the reasons for adopting a vegetarian diet, the actual diet used is not always healthy. Although studies show that a vegetarian diet tends to be healthier and more sustainable, if it is based on ultra-processed foods, the negative health effects tend to be the same as an omnivorous diet based on such products^{29,30}.

To promote vegetarian diets, it is crucial to understand the barriers that prevent or hinder their adherence. Graça, Godinho, and Truninger³¹ found that

a difficulty was obtaining reliable, practical information, informing on how to follow increasingly vegetable-based diets, and reducing meat consumption, besides the lack of cooking skills necessary to prepare balanced and appetizing vegetable meals that are adapted to personal preferences.

Professionals must be up to date, understand how to guide a balanced vegetarian diet, and ensure that their patients' health goals are achieved no matter what reason led them to follow it. Considering the wide range of ultra-processed vegan products seen in recent years⁹, nutritional education for the population, based on scientific evidence, is crucial. Also, support to change how we see our dishes, learn to try new flavors, and show that the basis of food should not be those products that, despite being "made from plants", are far from being "real food".

This study has some limitations, such as the small number of selected studies, the quality of the evidence, and the studies' designs that do not allow us to conduct a systematic review.

Because of the nature of the studies included in this review, major generalizations and conclusions are not possible. More consistent evidence is needed to understand if there is a real gap in healthcare courses curriculum, especially regarding plant-based diets.

CONCLUSION

Health professionals are generally dissatisfied with the amount of nutrition content they receive during undergraduate and specialization courses, particularly regarding alternative food choices such as vegetarianism. Despite being seen as healthy, a vegetarian diet is not commonly recommended by health professionals, even with the vast volume of studies proving its benefits. More consistent studies, preferably with standardized questionnaires, are needed to understand nutritionists' level of knowledge and stigmas about this diet and to deepen the issues addressed among other health professionals.

REFERENCES

- Melina V, Craig W, Levin S. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. *J Acad Nutr Diet*. 2016;116(12):1970-80. <https://doi.org/10.1016/j.jand.2016.09.025>
- Derbyshire EJ. Flexitarian Diets and Health: A Review of the evidence-based literature. *Front Nutr*. 2017;3(55):1-8. <https://doi.org/10.3389/fnut.2016.00055>
- Dinu M, Abbate R, Gensini GF, Casini A, Sofi F. Vegetarian, vegan diets and multiple health outcomes: A systematic review with meta-analysis of observational studies. *Crit Rev Food Sci Nutr*. 2017;57(17):3640-9. <https://doi.org/10.1080/10408398.2016.1138447>
- Food and Agricultural Organization to the United Nations (FAO). Sustainable diets and biodiversity. Burlingame B, Dernini S, editors. Biodiversity and sustainable diets united against hunger. Rome, Italy: Nutrition and Consumer Protection Division; 2010.
- Fresán U, Sabaté J. Vegetarian Diets: Planetary health and its alignment with human health. *Adv Nutr*. 2019;10:S380-8. <https://doi.org/10.1093/advances/nmz019>
- Crowley J, Ball L, Hiddink GJ. Nutrition in medical education: a systematic review. *Lancet Planet Health*. 2019;3(9):e379-89. [https://doi.org/10.1016/S2542-5196\(19\)30171-8](https://doi.org/10.1016/S2542-5196(19)30171-8)
- Brasil, Ministério da Saúde, Secretaria de Atenção à saúde. Guia Alimentar para a População Brasileira. 2a edição. Brasília, DF; 2014.
- Brasil, Ministério da Saúde, Hospital do Coração. Alimentação Cardioprotetora. Brasília, DF; 2018.
- TGFI. Indústria de Proteínas Alternativas. Brasil; 2020.
- Cochrane Library. Part 2: Core Methods. In: Higgins J, Thomas J, editors. *Cochrane Handb Syst Rev Interv* [Internet]. 6.1. Cochrane Training; 2020. Available from: <https://training.cochrane.org/handbook/current/chapter-01>
- Souza MT, Dias M, Carvalho R. Revisão integrativa: o que é e como fazer. *einstein*. 2010;8:102-6. <https://doi.org/10.1590/s1679-45082010rw1134>
- Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. *Syst Rev*; 2016;5(1):210. <https://doi.org/10.1186/s13643-016-0384-4>

13. Spencer EH, Elon LK, Frank E. Personal and Professional Correlates of US Medical Students' Vegetarianism. *J Am Diet Assoc.* 2007;107(1):72-8. <https://doi.org/10.1016/j.jada.2006.10.034>
14. Sanne I, Bjørke-Monsen AL. Lack of nutritional knowledge among Norwegian medical students concerning vegetarian diets. *J Public Health.* 2020;30:495-501. <https://doi.org/10.1007/s10389-020-01327-7>
15. Bettinelli ME, Bezze E, Morasca L, Plevani L, Sorrentino G, Morniroli D, et al. Knowledge of health professionals regarding vegetarian diets from pregnancy to adolescence: An observational study. *Nutrients.* 2019;11(5):3-11. <https://doi.org/10.3390/nu11051149>
16. Hawkins IW, Mangels AR, Goldman R, Wood RJ. Dietetics Program Directors in the United States Support Teaching Vegetarian and Vegan Nutrition and Half Connect Vegetarian and Vegan Diets to Environmental Impact. *Front Nutr.* 2019;6:123. <https://doi.org/10.3389/fnut.2019.00123>
17. Krause AJ, Williams KA. Understanding and Adopting Plant-Based Nutrition: A Survey of Medical Providers. *Am J Lifestyle Med.* 2019;13(3):312-18. <https://doi.org/10.1177/1559827617703592>
18. Harkin N, Johnston E, Mathews T, Guo Y, Schwartzbard A, Berger J, Gianos E. Physicians' Dietary Knowledge, Attitudes, and Counseling Practices: The Experience of a Single Health Care Center at Changing the Landscape for Dietary Education. *Am J Lifestyle Med.* 2019;13(3):292-300. <https://doi.org/10.1177/1559827618809934>
19. Hamiel U, Landau N, Eshel Fuhrer A, Shalem T, Goldman M. The Knowledge and Attitudes of Pediatricians in Israel Towards Vegetarianism. *J Pediatr Gastroenterol Nutr.* 2020;71(1):119-24. <https://doi.org/10.1097/MPG.0000000000002721>
20. Asher KE, Doucet S, Luke A. Registered dietitians' perceptions and use of the plant-based recommendations in the 2019 Canada's Food Guide. *J Hum Nutr Diet.* 2021;34(4):715-23. <https://doi.org/10.1111/jhn.12845>
21. Clark BE, Pope L, Belarmino EH. Personal bias in nutrition advice: A survey of health professionals' recommendations regarding dairy and plant-based dairy alternatives. *PEC Innov.* 2022;1:100005. <https://doi.org/10.1016/j.pecinn.2021.100005>
22. Meulenbroeks D, Versmissen I, Prins N, Jonkers D, Gubbels J, Scheepers H. Care by midwives, obstetricians, and dietitians for pregnant women following a strict plant-based diet: A cross-sectional study. *Nutrients.* 2021;13(7):2394. <https://doi.org/10.3390/nu13072394>
23. McHugh P, Smith M, Wright N, Bush S, Pullon S. If You Don't Eat Meat... You'll Die. A Mixed-Method Survey of Health-Professionals' Beliefs. *Nutrients.* 2019;11(12):3028. <https://doi.org/10.3390/nu11123028>
24. Corrin T, Papadopoulou A. Understanding the attitudes and perceptions of vegetarian and plant-based diets to shape future health promotion programs. *Appetite.* 2017;109:40-47. <https://doi.org/10.1016/j.appet.2016.11.018>
25. Mogre V, Stevens FCJ, Aryee PA, Amalpa A, Scherpbier AJJA. Why nutrition education is inadequate in the medical curriculum: A qualitative study of students' perspectives on barriers and strategies. *BMC Med Educ.* 2018;18(1):26. <https://doi.org/10.1186/s12909-018-1130-5>
26. Vesanto M, Craig W, Levin S. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. *J Acad Nutr Diet.* 2016;116(12):1970-80. <https://doi.org/10.1016/j.jand.2016.09.025>
27. Miki AJ, Livingston KA, Karlson MC, Folta SC, McKeown NM. Using Evidence Mapping to Examine Motivations for Following Plant-Based Diets. *Curr Dev Nutr.* Oxford University Press; 2020;4(3):nzaa013. <https://doi.org/10.1093/cdn/nzaa013>
28. Hopwood CJ, Bleidorn W, Schwaba T, Chen S. Health, environmental, and animal rights motives for vegetarian eating. *PLoS One.* 2020;15(4):20-4. <https://doi.org/10.1371/journal.pone.0230609>
29. Silveira JA da, Meneses SS, Quintana PT, Santos V de S. Association between overweight and consumption of ultra-processed food and sugar-sweetened beverages among vegetarians. *Rev Nutr.* 2017;30(4):431-41. <https://doi.org/10.1590/1678-98652017000400003>
30. Gehring J, Touvier M, Baudry J, Julia C, Buscail C, Srour B, Hercberg S, Péneau S, Kesse-Guyot E, Allès B. The consumption of ultra-processed foods by fish-eaters, vegetarians, and vegans is associated with the duration and commencing age of diet. *Proc Nutr Soc.* 2020;79(OCE2). <https://doi.org/10.1017/S0029665120004152>
31. Graça J, Godinho CA, Truninger M. Reducing meat consumption and following plant-based diets: Current evidence and future directions to inform integrated transitions. *Trends Food Sci Tech.* 2019;91:380-90. <https://doi.org/10.1016/j.tifs.2019.07.046>
32. Moher D, Liberati A, Tetzlaff J, Altman D, The PRISMA group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med.* 2009;6(7):e1000097. <https://doi.org/10.1371/journal.pmed.1000097>

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