

COMMENTARY

Oral Health of Vegetarians is a Neglected Aspect of Stomatological Research: A Reflection based on PubMed Evidence

Kehinde Kazeem Kanmodi^{1,2}, Lawrence Achilles Nnyanzi¹, Omotayo Amidu Sulaiman^{2,3}, Charles Oluwaseun Adetunji⁴

¹School of Health and Life Sciences, Teesside University, Middlesbrough, UK

²Cephas Health Research Initiative Inc, Ibadan, Nigeria

³Department of Restorative Dentistry, University of Ibadan, Nigeria

⁴Department of Microbiology, Edo University, Auchi, Nigeria

ABSTRACT

The vegetarians form one-fifth of the global population. The vegetarians are a peculiar group of people; existing body of scientific evidence shows that they are a highly vulnerable group of people when it comes to oral diseases. The oral health of vegetarians is a critical aspect of dentistry; however, current evidence—based on PubMed database search—shows a dearth of literature on this thematic area. It appears this aspect is being neglected in the field of stomatological research.

INTRODUCTION

It is a general saying that 'you are what you eat'. This is a very true statement; what you eat goes a very long way in determining who you are, where you come from, what you are passing through, what you are up to, and why you eat [1]. There are many

Correspondence:

Dr. Kehinde Kazeem Kanmodi
School of Health and Life Sciences, Teesside University,
Middlesbrough, UK
k.kanmodi@tees.ac.uk; kanmodikehinde@yahoo.com
+447921836178

factors that determine the pattern and choices people make in feeding themselves and/or their families [1]. For example, some people's choices of food are based on religious ideologies. In some religious societies, what one eats may determine how others perceive him/her i.e. being referred to as a faithful or a non-faithful. Whilst it is forbidden to eat pork in Jewish and Muslim societies, it is not forbidden in some non-Muslim and non-Jewish societies [2,3]. Arguably, the initiation, maintenance and modification of eating habits are complex processes.

Who are Vegetarians?

Based on the content of what is being eaten, people are classified as vegetarians and non-vegetarians. A vegetarian is a person who abstains from eating meat (flesh), seafood, and by-products of animal slaughter [4,5]. On the other hand, a non-vegetarian is a person who eats any or all of what vegetarians abstain from. A vegetarian diet is a very special diet and it includes variety of delicacies (Table 1) [4,5].

Keywords: Vegetarian; oral health; stomatology; research; paucity

This article is available online at: <http://www.mjz.co.zm>, <http://ajol.info/index.php/mjz>, doi: <https://doi.org/10.55320/mjz.49.2.2>

The Medical Journal of Zambia, ISSN 0047-651X, is published by the Zambia Medical Association

© This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

link: https://creativecommons.org/choose/results-one?license_code=by&jurisdiction=&version=4.08&lang=en



The reasons why people choose to be vegetarians are complex, with religious, health-related, economic and sociocultural underpinnings [6]. For instance, some vegetarians are so based on food choice, food affordability, and/or environmental conservatism [6] while some vegetarians, due to their religious inclinations, believe that humans are not superior to other animals so humans should not be killing them (animals) for food.

Table 1. Foods eaten and avoided by vegetarians

Foods eaten	Foods avoided
Fruits (e.g. apple, guava, mango, banana, orange, lemon, lime, pineapple, etc.)	Flesh (e.g. beef, pork, mutton, chicken, etc.)
Vegetables (e.g. spinach, salad, bitter leaf, water leaf, etc.)	Seafood (e.g. fish, crayfish, shrimp, periwinkle, crab, etc.)
Grains	Insects (e.g. locust, bee, grasshopper, etc.)
Pulses	Blood meal
Nuts and seeds	Offal (animal intestine, liver, kidney, spleen, lung, etc.)
Dairy products	Fat from animals (e.g. lard)
Honey	Animal rennet or gelatine

How many People are Vegetarians?

There is a colossal numerical size of vegetarians in the world – 375 million people [7]; and the number keeps increasing across various parts of the world.

What are the Peculiarities of Vegetarians with Respect to Oral Health?

According to the World Health Organization (WHO), health can be defined as *a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity* [8].

Oral health can be grouped under physical health. Being a vegetarian has its own oral health-related peculiarities; as shown in Table 2.

Table 2. Oral health-related peculiarities of vegetarians

Vegetarians are at a significantly higher risk of dental erosion as compared to non-vegetarians [9,10]
The numbers of root carious lesions, nonvisible carious lesions, and white spot lesions are significantly higher in vegetarians as compared to non-vegetarians [9]

Research Outputs on Vegetarianism and Oral Health

Using PubMed, a leading world-class database of medical and health-related literature, we conducted a filtered search (on 18 Jul. 2021) of relevant English publications (from preceding years till end of December 2020) using multiple combinations of words relevant to the scope of this study using the PubMed Advanced Search Builder [11] (Table 3). Further, we conducted a bibliographic review of the publications we obtained from our focused search (Table 3).

A total of 85 publications appeared from our PubMed-based search on vegetarianism and oral health, using this search combination: *((vegetarian) OR (vegetarian diet)) OR (vegetarianism) AND (oral health)*. From our bibliographic review of these 85 publications, only 13 were found to be primarily written on the oral health aspects of vegetarians. Also, from there view, we observed that the first PubMed-indexed publication on vegetarianism and oral health was published in 1985. The year 2020 had the highest frequency of such publications (Figure 1). Also, none of these publications was a clinical trial study while only 1 publication was a systematic review with meta-analysis (Table 4).

Table 3. Outcome of PubMed search of relevant terms

Combination of relevant search terms	Total number of hits
Oral health	195,621
((vegetarian) OR (vegetarian diet)) OR (vegetarianism)	5,776
((((vegetarian) OR (vegetarian diet)) OR (vegetarianism)) AND (oral health))	85

Table 4. Relevant publication types and frequency based on PubMed-provided data after data search

Publication Type	Frequency
Book (edited book, monograph, etc.)	0
Book chapter	0
Original article (cross-sectional study)	10
Original article (others)	0
Original article (study type not defined; no abstract seen)	1
Review article (systematic review)	1
Review article (systematic review with meta-analysis)	1
Review article (narrative review)	0
Commentary	0
Letter to editor	0
Others	0

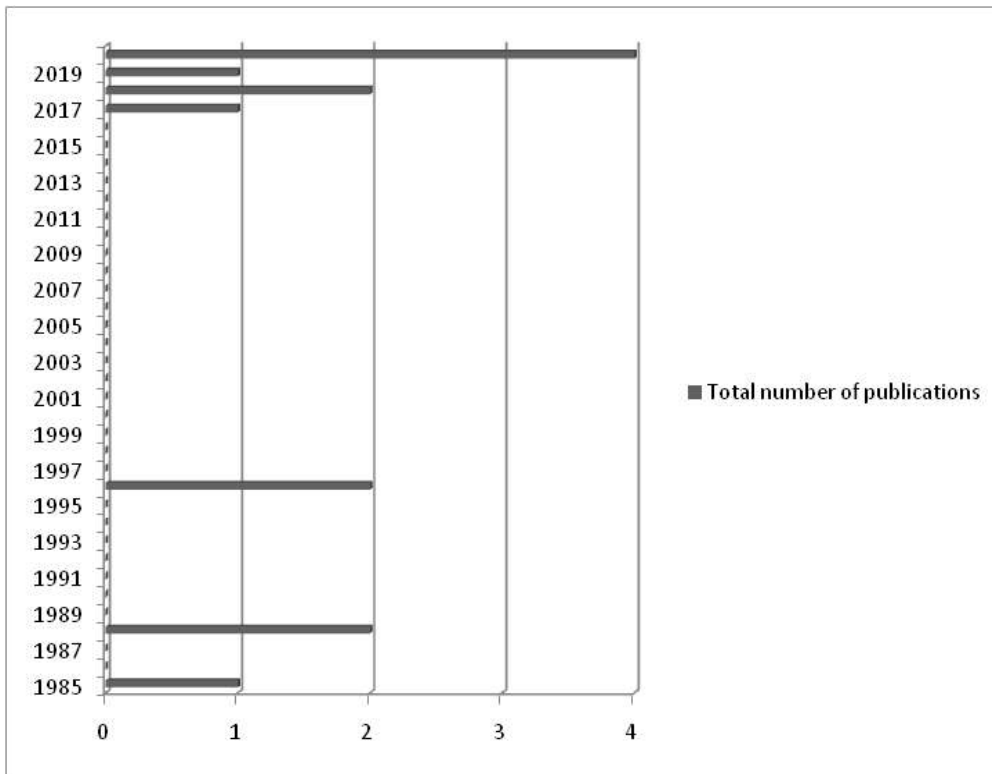


Figure 1. Total number of relevant PubMed-indexed publications per year (1985 –2020)

The Need for More Coordinated Research Exploring the Oral Health Aspects of Vegetarians

Since the mouth is one of the gateways to the human body; hence, oral health constitutes a very vital aspect of human health. There are numerous diseases affecting the human mouth. Some oral diseases are more pronounced in severity amongst some population groups, especially the vegetarians [9,10].

As at 2021, the estimated world population is 7.9 billion people [12]; of which roughly one-fifth are vegetarians [7]. The population of vegetarians form a significant proportion of the world's population; however, only a very little quantity of research outputs is available on the oral health aspects of this peculiar group. In fact, the few available scientific studies exploring the oral health aspects of vegetarians have clearly shown that they are highly avulnerable population group [Table 2].

However, other aspects of health of vegetarians – physical health, mental health, and spiritual health – had been relatively well-studied, unlike oral health. The above findings clearly reveal the need for more coordinated research exploring the oral health aspects of vegetarians.

CONCLUSION

So far, there is a huge dearth of literature on the oral health aspects of vegetarians. With the growing population of vegetarians in the global community, more efforts need to be directed towards their oral healthcare, as they are a vulnerable population group from an oral health point of view.

FUNDING

This study was self-funded.

Conflicts of Interest

Author has none to declare.

REFERENCES

1. Committee on Examination of the Adequacy of Food Resources and SNAP Allotments; Food and Nutrition Board; Committee on National

Statistics; Institute of Medicine; National Research Council; Caswell JA, Yaktine AL, editors. Supplemental Nutrition Assistance Program: Examining the Evidence to Define Benefit Adequacy. Washington (DC): National Academies Press (US); 2013 Apr 23. 4, Individual, Household, and Environmental Factors Affecting Food Choices and Access. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK206912/>

2. Chabad.Org. Devarim – Deuteronomy –Chapter 14. Available from: https://www.chabad.org/library/bible_cdo/aid/9978/jewish/Chapter-14.htm#v=3&showrashi=true. Accessed 28 Sept. 2020.
3. Noble Quran. Surah Al-Baqarah [2.173]. Available from: [_](#) Accessed: September 28, 2020.
4. Vegetarian Society. What is a vegetarian? Available from: <https://vegsoc.org/info-hub/definition/?pid=508>. Accessed 28 Sept. 2020.
5. North American Vegetarian Society. Why avoid hidden animal ingredients? Available from: <https://navs-online.org/articles/why-avoid-hidden-animal-ingredients/>. Accessed 28 Sept. 2020.
6. Harvard Health Publishing. Becoming a vegetarian. Available from: <https://www.health.harvard.edu/staying-healthy/becoming-a-vegetarian#:~:text=People%20become%20vegetarians%20for%20many,ecessive%20use%20of%20environmental%20resources>. Published 15 Apr. 2020. Accessed 28 Oct. 2021.
7. Expo. 375 million vegetarians worldwide. All the reasons for a green lifestyle. Available from: <http://www.expo2015.org/magazine/en/lifestyle/375-million-vegetarians-worldwide.html>. Published 27 Oct. 2014. Accessed 2 Nov. 2020.

8. Constitution of the World Health Organization. Available from: https://www.who.int/governance/eb/who_constitution_en.pdf. Accessed 29 Jul. 2021.
9. Smits KPJ, Listl S, Jevdjevic M. Vegetarian diet and its possible influence on dental health: A systematic literature review. *Community Dent Oral Epidemiol.* 2020 Feb;48(1):7-13. doi: 10.1111/cdoe.12498. Epub 2019 Oct 1. PMID: 31571246; PMCID: PMC6972589.
10. Linkosalo E, Markkanen H. Dental erosions in relation to lactovegetarian diet. *Scand J Dent Res.* 1985 Oct;93(5):436-41. doi: 10.1111/j.1600-0722.1985.tb01336.x. PMID: 3864217.
11. National Library of Medicine. PubMed Advanced Search Builder. Available from: <https://pubmed.ncbi.nlm.nih.gov/advanced/>. Accessed 18 Jul. 2020.
12. Worldometer. Current world population. Available from: <https://www.worldometers.info/world-population/#ref-1> Accessed 03 Aug. 2021.