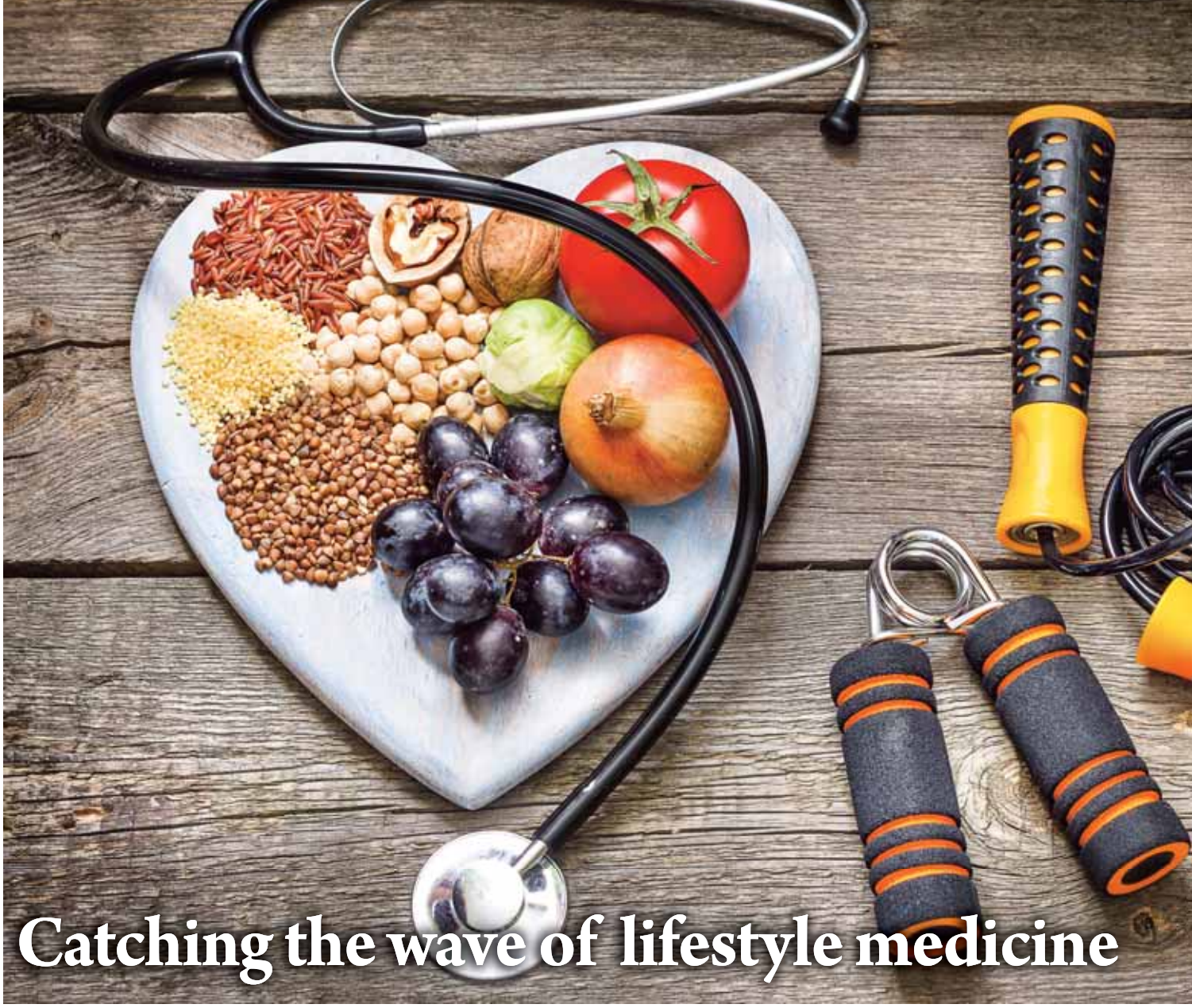

Catching the wave of lifestyle medicine

Maria Carolina Rojido
Freelance Medical Writer, Ségoufielle, France

Correspondence to:

Maria Carolina Rojido
1078 Chemin Bordeneuve
Ségoufielle, France, 32600
+33 6 48 72 06 18
carolinarojido@gmail.com

Abstract

Non-communicable diseases (degenerative chronic diseases) are wreaking havoc on human health, causing 70% of deaths worldwide, but lifestyle medicine is ready to tackle them by helping people change the habits behind them. A new medical specialty, lifestyle medicine can help relieve strained healthcare systems globally and is backed by a solid body of evidence. Moreover, there are massive research, educational, and medical communication needs for all audiences, from laypersons to experts. Interested medical writers may have abundant opportunities to work on this rising medical specialty in the near future.

Fertile ground for a new trend

Modern medicine and the reductionist approach

Medicine is complex and is continuously evolving. Through history it has gone through several paradigms that have dominated the way healers thought about diseases and how to cure them. At present, modern medicine follows a mostly reductionist paradigm. This 'divide and conquer' approach, where processes are reduced into simpler units to understand them, has allowed for amazing advances in diagnosing, treating, and preventing diseases. It is possible to explore biological processes underlying a disease at the molecular level, but sometimes the complex interactions between these processes result in effects different from those that might be expected. In other words, the whole is greater than the sum of its parts.[1]

Non-communicable diseases (NCDs) are good examples of this. Together, they cause 86% of all deaths in Europe[2] and 70% globally.[3] They include cardiovascular disease, chronic neurologic disorders (e.g., dementia), chronic respiratory diseases, diabetes, cancer, musculoskeletal diseases, and autoimmune disorders. Their prevalence and incidence are growing, and most are not curable or reversible by traditional means. These NCDs are the result of a combination of genetic, physiologic, environmental, and behavioural factors that are very often shared between them. Their aetiologies, pathophysiologies, and treatments are well known, but they are still the world's biggest killers. Why? It may be because, although we know them well, we do not understand them completely. We use reductionism to understand them since they are so complex, but we underestimate their root causes

and how they interact with each other. Also, although medicine offers fairly effective treatments for many of them, it does not properly address their risk factors: the reasons why people get these diseases in the first place are most often environmental and behavioural factors which affect physiological processes and gene expression, among other things.[4] Studies showing dramatically increased rates of cardiovascular disease and cancers of people migrating from low-risk to high-risk countries have shown that environmental/behavioural factors are the primary determinants of chronic diseases, not genetic ones.[5] And other studies, including twin studies, have shown that only 10 to 30% of chronic diseases are due to genetic factors.[6]

It is far easier for healthcare professionals to prescribe drugs or recommend surgery and for patients to accept these often expensive and risky treatments than to change lifelong habits reinforced by a consumerist society. This is not helped by the fact that we are cared for by physicians who do not fully understand nutrition and are fed by companies that do not care about health. The problem starts in medical school, where education on nutrition, exercise, addictive substance avoidance, and other lifestyle interventions is notoriously deficient. As a consequence, physicians who recommend lifestyle changes as a first line of prevention and disease management may feel unprepared to provide counselling in behavioural changes.[7] To make matters worse, the companies that sell animal products and ultra-processed foods (e.g. packaged baked foods, fizzy drinks, sugary cereals, ready meals, reconstituted meat products) are more interested in their profits than in the healthiness of their offerings.[1]

Human lifestyle changes and diseases

Homo sapiens appeared about 315,000 years ago.[8] In the last 10,000 years, our lifestyle habits have changed considerably. Our diet has seen some of the biggest changes. The advent of dairy products, refined plant derivatives (cereals, sugars, vegetable oils), fatty meats, and salt critically and fundamentally altered the glycaemic load, macronutrient content, fatty acid composition, micronutrient density, acid-base balance, sodium-potassium ratio, and fibre content of our diet.[9] Moreover, recent studies have linked ultra-processed foods with weight gain and cancer.[10,11] This shift, plus other changes like an increasingly sedentary lifestyle, chronically inadequate sleep, high stress, and use of addictive substances (tobacco, alcohol, other drugs), are very recent relative to our evolutionary history and underlie many of our degenerative chronic diseases. Such diseases are rarer in populations that have not much changed their traditional lifestyles. The most notable examples of these are the inhabitants of the 'blue zones': five places in the world that "not only have high concentrations of individuals over 100 years old, but also clusters of people who had grown old without health problems like heart disease, obesity, cancer, or diabetes".[12]

In the last century, there have been gains in the fight against communicable diseases and child and maternal mortality, but they are still major problems in developing countries. At the same time, rates of NCDs increased by almost 30% between 2000 and 2015, causing more than 50% of the disease burden in lower-middle income countries and affecting more younger people than in wealthier countries.[13] This negatively impacts the economies of lower-middle income countries. Meanwhile, NCDs cause 77% of the disease burden in Europe.[2] And although premature mortality from NCDs has decreased, there is a significant gap between life expectancy and healthy life expectancy (the number of years that a person is expected to live without an activity limitation or disability),[14] with men spending a fifth of their life in poor health and women nearly a quarter.[15]

The above changes have all happened at an unprecedented pace that never seems to wane, as NCDs reach pandemic proportions and disproportionally affect disadvantaged populations that do not have proper access to treatment.[13]

The "new" trend of lifestyle medicine

What is it?

Lifestyle changes have been a part of healthcare recommendations for decades, but they have traditionally only been considered helpful measures and are often still considered optional. First mentioned as a medical discipline in 1999,[16] lifestyle medicine is the logical response to our chronic disease pandemic. The Lifestyle Medicine Global Alliance (an organisation that unites national lifestyle medicine professional associations from around the world under a single banner) defines it as "the evidence-based medical specialty that uses lifestyle therapeutic approaches, such as a predominantly whole food plant-based diet, regular physical activity, adequate sleep, stress management, avoidance of risky substance use, and other non-drug modalities, to prevent, treat, and, oftentimes, reverse non-communicable disease, sometimes referred to as degenerative chronic disease."[17] Lifestyle medicine uses a thoroughly holistic approach, where whole plant-based foods work synergistically and, together with exercise, stress reduction, sleep, harmful substance avoidance, and social support, help the whole person (body, mind, and microbiome). Prolonged healthy life expectancy allows individuals to be more productive in their professional and personal

> Non-communicable diseases (NCDs) are good examples of this. Together, they cause 86% of all deaths in Europe and 70% globally.

lives. These changes can also help societies thrive by reducing their overall disease burden and healthcare costs. Last but not least, they are aligned with the changes humanity needs to implement for the sustainability of life on our planet, including our own as a species (Figure 1).[18]

Key elements?

Lifestyle medicine uses lifestyle interventions involving behavioural, environmental, medical and motivational principles to prevent, treat, and sometimes reverse NCDs that share risk factors and underlying mechanisms. It is complementary to traditional medicine, acting as an adjuvant to clinical and surgical interventions.[19] It is low cost and causes few, if any, side effects.

The central element is a whole food plant-based diet that emphasises the consumption of minimally processed and nutrient-dense vegetables, fruits, whole grains, legumes, nuts, and seeds. It minimises or eliminates meat, poultry, fish, eggs, dairy products, and processed foods of animal (sausages and cured meats) or plant origin (refined grains, added refined sugars and oils, artificial ingredients). It differs from veganism in its emphasis on whole foods; despite their deleterious health effects,[10,11] highly processed plant foods are accepted in veganism. It also differs in that it encompasses a spectrum of eating patterns that are predominantly plant-based but that, like vegetarianism, may include some animal products. However, its therapeutic effects appear to be more significant the closer it is to 100% plant-based.[20–23]

Together with other lifestyle interventions, this diet is anti-inflammatory, modifies gene expression, and changes our microbiome, thereby helping reverse the chemical processes behind NCDs.[4]

The growing body of evidence

The modern Western lifestyle is responsible for the global increase in NCD burden. Changing that lifestyle could help prevent, treat, and even reverse most NCDs: eliminating NCD risk factors can prevent 75% of heart disease, stroke, and type 2 diabetes and 40% of cancer.[24]

The body of evidence supporting lifestyle interventions is growing. Research studies related to lifestyle medicine have greatly increased in number in the last 30 years. In Clinicaltrials.gov, studies with the words lifestyle (factors, changes, interventions), plant-based (diet, dietary, or food), sleep, exercise (or physical activity), and stress management under the search field *Other Terms* increased on average 25-fold between 1990–1999 and 2000–2009 and 4-fold between 2000–2009 and 2010–2019 (Table 1). By comparison, oncology studies increased on average 8-fold between 1990-1999 and 2000-2009 and 2-fold between 2000-2009 and 2010-2019 (Figure 2).

In terms of individual studies, the Nurses' Health Study (in which 75,521 women aged 38 to 63 years old were followed for 10 years) concluded that more than 80% of all heart disease and more than 91% of all diabetes in women could be eliminated if they were to adopt a cluster of positive practices (keeping a healthy body weight, regular physical activity, avoiding tobacco products, consuming more whole grains, fruit, and vegetables, and consuming no more than one alcoholic beverage per day).[25] The US Health Professionals Study[26] (in which 42,847 men aged

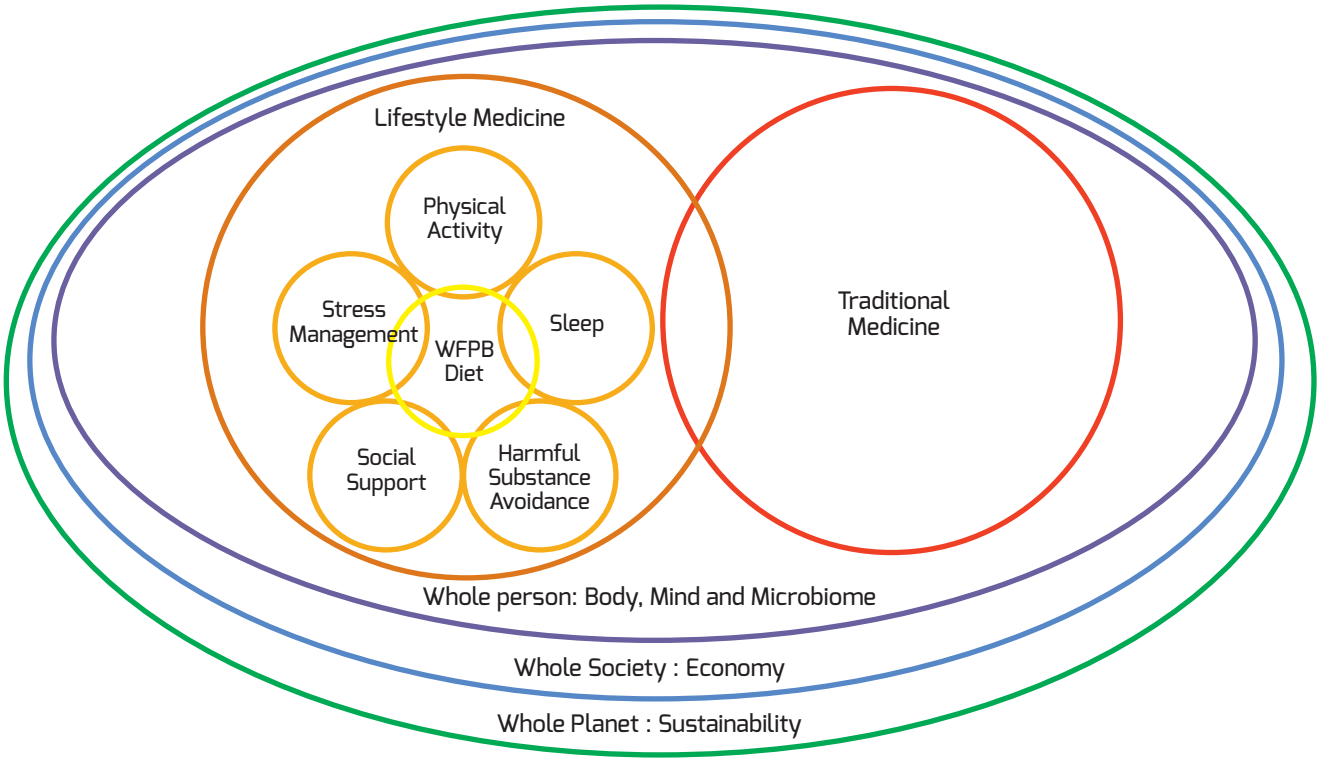

Figure 1. How lifestyle medicine works, according to the author

40 to 75 years old were followed up for 16 years) found similar results in men. Elsewhere, the American Institute for Cancer Research and the International Agency for Research on Cancer concluded that there is sufficient evidence to link 13 human malignancies to excess body fat.[27] Smaller studies have shown that a whole food plant-based diet can help treat and reverse cardiovascular disease and diabetes, and that it can help treat cancers.[20,21,23,28,29,30]

In spite of these findings, the well-known statement "more research is needed" could not be more relevant than when it comes to studies looking at the effects of whole food plant-based nutrition. Most of the research has been done

Table 1. ClinicalTrials.gov search for studies related to lifestyle medicine with start dates from January 1, 1990, to June 25, 2019.

The keywords used under the search field "Other Terms" were:

1.	"lifestyle factors OR lifestyle changes OR lifestyle interventions" (plus the synonyms "interventional" and "procedures")
2.	"plant-based diet OR plant-based dietary OR plant-based food"
3.	"sleep"
4.	"exercise" (plus the synonym "physical activity")
5.	"stress management"

	Search term(s)	**January 1, 1990 – December 31, 1999**	**January 1, 2000 – December 31, 2009**	**Fold increase (2000–2009 vs. 1990-1999)**	**January 1, 2010 – June 25, 2019**	**Fold increase (2010–2019 vs. 2000 – 2009)**
1.	Lifestyle (factors, changes, interventions)	43	829	19	2849	3
2.	Plant-based (diet, dietary, food)	0	16	16	106	7
3.	Sleep	75	2702	36	8598	3
4.	Exercise/physical activity	172	4138	24	16,890	4
5.	Stress management	11	324	29	1172	4
	Sum (1 to 5)	301	8009	27	29,615	4
	Average (1 to 5)			25		4
	Oncology (cancer, tumor, neoplasm)	2725	21,923	8	42,536	2
	All studies registered	6443	88,478	14	194,696	2

For comparison, "oncology" (plus the synonyms "neoplasm", "cancer", "tumor", "malignancy", "neoplasia", "neoplastic syndrome", "oncologic", and "neoplastic disease") was searched for under the search field "Conditions or disease". Each set of keywords was searched three times for the periods January 1, 1990, to December 31, 1999; January 1, 2000, to December 31, 2009; and January 1, 2010, to June 25, 2019. All study types and results were included.

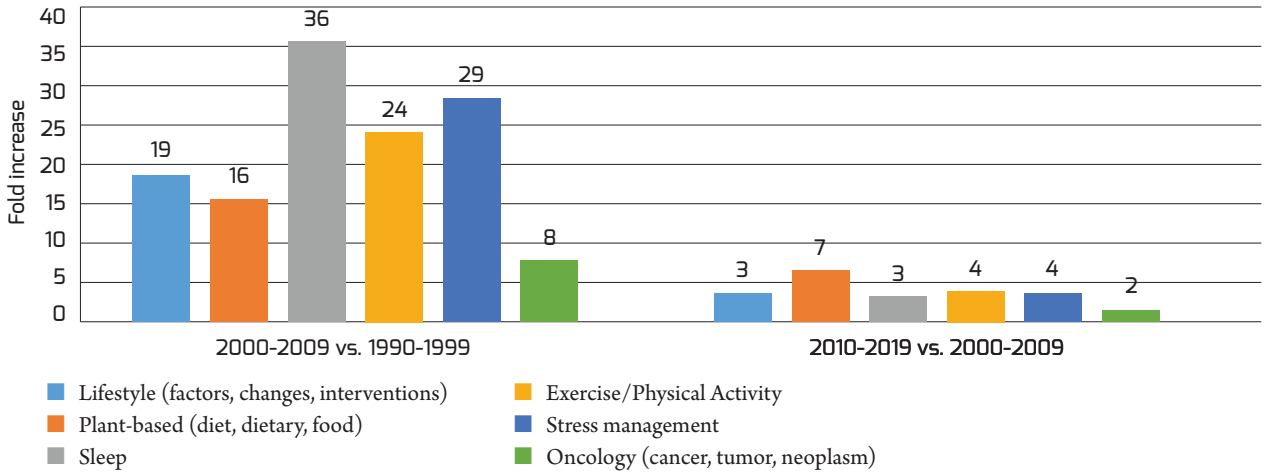

Figure 2. Fold increases in studies listed in ClinicalTrials.gov related to lifestyle medicine from 1990–1999 to 2000–2009 and from 2000–2009 to 2010–2019. Oncology studies are included for reference.

under the reductionist paradigm, looking at the effects of single foods or components. Fortunately, the effects of dietary and other lifestyle interventions are increasingly being studied, even in the context of randomised studies, but much more research is still needed.

Where is it going?

Education and training

Many medical universities are starting to incorporate more education on nutrition and lifestyle medicine, because their current curriculums are deficient in these aspects and medical students are demanding it. Harvard Medical School incorporated a Division of

Table 2. PubMed search for articles related to lifestyle medicine with publication dates from January 1, 1990, to June 25, 2019.

Titles were searched for the following keywords:

1.	"lifestyle interventions OR lifestyle factors OR lifestyle changes"
2.	"plant-based diet OR plant-based dietary OR plant-based food"
3.	"sleep"
4.	"exercise OR physical activity"
5.	"stress management"
6.	"oncology OR cancer OR tumor OR neoplasm OR malignancy".

	Search term(s)	January 1, 1990 – December 31, 1999	January 1, 2000 – December 31, 2009	Fold increase (2000–2009 vs. 1990-1999)	January 1, 2010 – June 25, 2019	Fold increase (2010–2019 vs. 2000–2009)
1.	Lifestyle (factors, changes, interventions)	213	1006	5	2382	2
2.	Plant-based (diet, dietary, food)	3	30	10	134	4
3.	Sleep	10,269	19,453	2	40,062	2
4.	Exercise/physical activity	18,261	31,310	2	64,917	2
5.	Stress management	285	526	2	917	2
	Sum (1 to 5)	29,031	52,325	2	108,412	2
	Average (1 to 5)			4		3
	Oncology (cancer, tumor, neoplasm, malignancy)	147,014	281,357	2	564,168	2

Each of these sets of keywords was searched three times, for the periods January 1, 1990, to December 31, 1999; January 1, 2000, to December 31, 2009; and January 1, 2010, to June 25, 2019, by adding the following to the search string: AND (("1990/01/01"[PDat] : "1999/12/31"[PDat])), AND (("2000/01/01"[PDat] : "2009/12/31"[PDat])), AND (("2010/01/01"[PDat] : "2019/06/25"[PDat])). No other filters were applied.

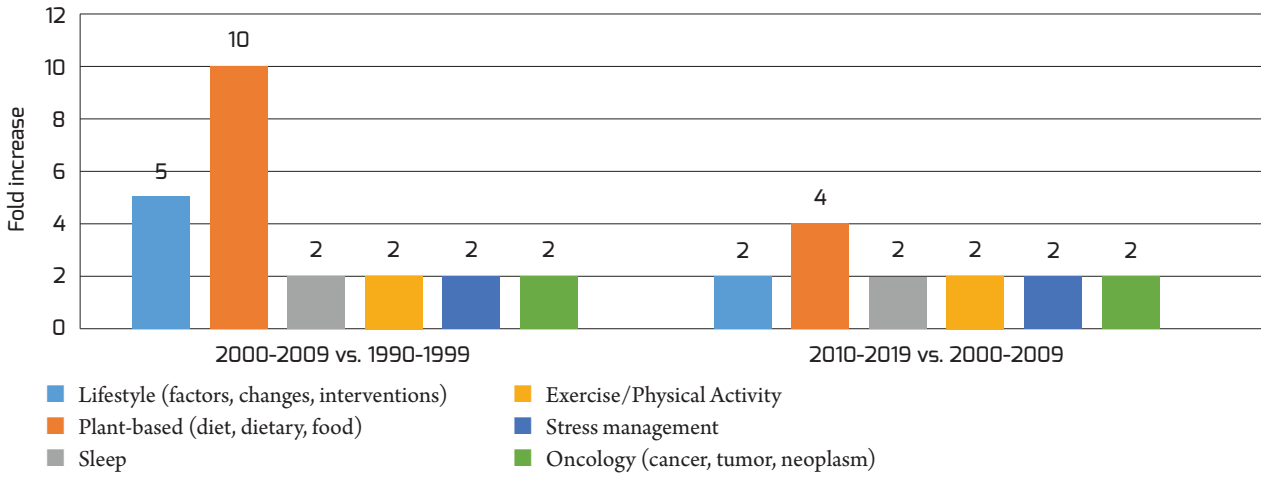

Figure 3. Fold increases in articles published in PubMed related to lifestyle medicine from 1990–1999 to 2000–2009 and from 2000–2009 to 2010–2019. Oncology studies are included for reference.

Nutrition in 1996,[31] and a residence programme is currently being piloted in four American universities.[32] In Europe, Cambridge University is creating a new curriculum on public health with a focus on nutrition, physical activity, and sleep,[33] and the UK University of Surrey offers a Masters in Nutritional Medicine.

Many medical organisations offer national and international board certification programmes. Several lifestyle medical associations are supporting licensed physicians wanting to train themselves on lifestyle medicine. The first was the American College of Lifestyle Medicine, which founded the Lifestyle Medicine Global Alliance in 2015 "in response to the need for lifestyle solutions in low- and middle-income countries and for coordination between lifestyle medical professional organisations around the world". It includes organisations based in the United States, Australasia, the United Kingdom, Lithuania, Albania, Portugal, Iran, and Korea.[17] Other lifestyle medicine associations and organisations include the European Lifestyle Medicine Organization, the Institute of Lifestyle Medicine, and the Plantrician Project.

Funding and policy changes

Calls for grants related to lifestyle medicine are abundant. The NIH's National Center for Complementary and Integrative Health is requesting grant applications, as is the European Commission's Steering Group on Health Promotion, Disease Prevention, and Management of NCDs.[34] The American College of Lifestyle Medicine and many other foundations (such as the Ardmore Institute of Health, the Weil Foundation, and the Osher Center for Integrative Medicine) and organisations (such as ProVeg, an international food awareness organisation that aims to improve human health, animal welfare, the environment, food justice, and public opinion on plant-based food) offer grants as well.

Policy changes are starting to take place, as hospitals and schools add more plant-based options and businesses (e.g. Nestlé, Danone, Unilever, Cargill) try to improve the quality and sustainability of their offerings.[35] Earlier this year, the Canadian government changed its dietary recommendations by eliminating the dairy section to simply encouraging people to consume 50% vegetables and fruit, 25% whole grains, and 25% protein foods (meats, dairy, beans, nuts, or seeds). That is, it is now recommending a plant-based diet.[36]

Following the lead of Kaiser Permanente, a large managed care organisation in the US that advises its physicians to recommend an active lifestyle and plant-based diet to their patients, lifestyle counselling is starting to be reimbursed in the US.[37]

The evidence translates into…

Similar to the ClinicalTrials.gov study trends mentioned above, numbers of PubMed articles with the words lifestyle (factors, changes, and interventions), plant-based (diet, dietary, or food), sleep, exercise (or physical activity), and stress management in their titles have increased greatly. A simple search of the number of articles for the periods 1990–1999, 2000–2009, and from 2010 to June 25, 2019, shows the trend. Studies related to lifestyle topics increased on average fourfold between 1990–1999 and 2000–2009 and threefold between 2000–2009 and 2010–2019 (Table 2). By comparison, oncology studies increased on average twofold between 1990–1999 and 2000–2009 and between 2000–2009 and 2010–2019 (Figure 3).

The increased number of publications has translated into new and clearer guidelines and recommendations in terms of what measures should be put in effect (or not):

- The 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults recommends the plant-based DASH (Dietary Approaches to Stop Hypertension) diet as one of the basic steps to fight hypertension.[38]
- The World Cancer Research Fund recommendations regarding lifestyle changes for preventing and surviving cancer include basic concepts underpinning whole food plant-based diets.[39,40]
- The 2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults includes plant-based diets in its recommended strategies to achieve caloric deficits.[41]
- Preventing Cancer, Cardiovascular Disease and Diabetes: A Common Agenda for the American Cancer Society, the American Diabetes Association, and the American Heart Association emphasises the benefits of whole-grain foods, legumes, vegetables, and fruits and recommends limitations on red meat, full-fat dairy products, and items high in added sugars.[42]

Moreover, lifestyle medicine is increasingly being addressed by major medical journals. *The Lancet* established the 'Food in the Anthropocene' commission, a scientific consensus of what constitutes a healthy and sustainable diet and the actions needed to support the accelerated transformation of our food system for the sake of our health and our planet,[18] and launched *The Lancet Planetary Health* open access journal in April 2017. *BMJ Nutrition, Prevention and Health,* which launched in July 2018, publishes on the impact of nutrition and lifestyle factors on individual and population health. Other noteworthy journals dedicated to the subject are the *American Journal of Lifestyle Medicine* and the *International Journal of Disease Reversal and Prevention*. Congresses and conferences on lifestyle medicine and whole food plant-based nutrition are also increasing in number and attendance.

Relevance to medical writers

Even if lifestyle medicine were to become a global phenomenon, people would still get sick and need drugs or surgery for acute and chronic life-threatening conditions. However, the effectiveness of traditional medicines can be greatly increased if lifestyle changes are encouraged as a real part of prevention and treatment. Healthcare systems are collapsing under the weight of NCDs and developing countries' economies are failing in part due to the double burden of diseases (communicable and non-communicable) and lack of resources they suffer.

Even if lifestyle medicine were to become a global phenomenon, people would still get sick and need drugs or surgery for acute and chronic life-threatening conditions.

The body of evidence behind lifestyle medicine is now so large that it comes down to honouring the Hippocratic oath and its most essential "First do no harm" concept. Many medical writers are healthcare professionals of some kind, and healthcare professionals have an ethical duty to inform their patients about the

lifestyle and dietary changes that can help them avoid suffering, disability, and early death. Some might say that medical writers are not qualified to give such advice. But we know smoking makes people sick, so all types of physicians have a duty to tell smokers to stop. If food can literally be the poison or the medicine people take every time they eat or drink, why not say so? Recommendations should not be watered down under the assumption that people will not change their habits. Other lifestyle changes are clearly very important, and depending on socioeconomic circumstances they may be harder or easier to implement. But one thing we are sure of: everybody eats and drinks many times a day, and most of us have at least some say over what we consume. We can be sure we'll all die someday, but what if we can stay healthy longer and die much later?

Medical writers should be aware of lifestyle medicine, as sooner or later they may be asked to work on documents related to it. The demand for regulatory documents will rise. But it is medical communications that will likely see the most activity, because of the huge need to fill knowledge gaps at all levels. Perhaps some medical writers will seek opportunities to write on this subject because they are interested in it for the benefit of their health or that of the environment. Some of those grants, studies, articles, books, websites, or conferences may come knocking on our doors sooner than expected. So, be ready!

Acknowledgements

The author would like to thank Stephen Gilliver for his invaluable expertise and dedication, Laura Collada Ali for her encouragement and wisdom, and Helen Spottiswoode and Julia James for their assistance.

Conflicts of interest

The author declares no conflicts of interest.

References

1. Campbell TC. The China study: the most comprehensive study of nutrition ever conducted and the startling implications for diet, weight loss and long-term health. Campbell TM, editor. Kent Town, S. Aust: Wakefield Press; 2007.
2. World Health Organization. European Office for NCDs. 2019 [cited 2019 May 30]. Available from: http://www.euro.who.int/en/health-topics/noncommunicable-diseases.
3. World Health Organization. Non-communicable diseases. 2018 [cited 2019 May 30]. Available from: https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases.
4. Bodai BI, Nakata TE, Wong WT, et al. Lifestyle medicine: A brief review of its dramatic impact on health and survival. Perm J. 2018;22:17-025.
5. Willett WC KJ, Nugent R, et al. In: Jamison DT BJ, Measham AR, et al., editors. Disease control priorities in developing countries. 2nd ed. Washington (DC): The International Bank for Reconstruction and Development/The World Bank; 2006.
6. Rappaport SM, Smith MT. Epidemiology. Environment and disease risks. Science. 2010;330(6003):460–1.
7. Polak R, Pojednic RM, Phillips EM. Lifestyle medicine education. Am J Lifestyle Med. 2015;9(5):361–7.
8. Tuttle RH. Human evolution: Encyclopaedia Britannica; 2019 [cited 2019 July 4]. Available from: https://www.britannica.com/science/human-evolution.
9. Cordain L, Eaton SB, Sebastian A, et al. Origins and evolution of the Western diet: health implications for the 21st century. Am J Clin Nutr. 2005;81(2):341–54.
10. Fiolet T, Srour B, Sellem L, et al. Consumption of ultra-processed foods and cancer risk: results from NutriNet-Sante prospective cohort. BMJ. 2018;360:k322.
11. Hall KD, Ayuketah A, Brychta R, et al. Ultra-processed diets cause excess calorie intake and weight gain: An inpatient randomized controlled trial of ad libitum food intake. Cell Metab. 2019;30(1):67–77.e3.
12. National Geographic. 5 "blue zones" where the world's healthiest people live. 2017 [cited 2019 May 30]. Available from: https://www.nationalgeographic.com/books/features/5-blue-zones-where-the-worlds-healthiest-people-live/.
13. The next pandemic? Non-communicable diseases in developing countries. The Economist Intelligence Unit Limited. 2017.
14. Eurostat. Number of healthy years of life: countries compared. 2019 [cited 2019 July 4]. Available from: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190204–1.
15. EPHA E, NCDA. Joint paper: Towards an EU strategic framework for the prevention of non-communicable diseases (NCDs). Brussels, Belgium: European Public Health Alliance, 2019.
16. Rippe JM, editor. Lifestyle medicine. 1st ed. New York: Blackwell; 1999.
17. Lifestyle Medicine Global Alliance. About. 2019 [cited 2019 May 31]. Available from: https://lifestylemedicineglobal.org/about/.
18. Willett W, Rockstrom J, Loken B, et al.

Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019;393:447–92.
19. Sagner M, Katz D, Egger G, et al. Lifestyle medicine potential for reversing a world of chronic disease epidemics: from cell to community. Int J Clin Pract. 2014;68(11):1289–92.
20. Ornish D, Scherwitz LW, Billings JH, et al. Intensive lifestyle changes for reversal of coronary heart disease. JAMA. 1998;280(23):2001–7.
21. Ornish D, Weidner G, Fair WR, et al. Intensive lifestyle changes may affect the progression of prostate cancer. J Urol. 2005;174(3):1065–9.
22. Allen KE, Gumber D, Ostfeld RJ. Heart failure and a plant-based diet. A case-report and literature review. Front Nutr. 2019;6:82.
23. Barnard ND, Cohen J, Jenkins DJ, et al. A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: a randomized, controlled, 74-wk clinical trial. Am J Clin Nutr. 2009;89(5):1588–96.
24. World Health Organization. Non-communicable diseases, Fact file. 2013. [cited 2019 May 30]. Available from: http://www.who.int/features/factfiles/noncommunicable_diseases/en/.
25. Liu S, Stampfer MJ, Hu FB, et al. Whole-grain consumption and risk of coronary heart disease: results from the Nurses' Health Study. Am J Clin Nutr. 1999;70(3):412–9.
26. Chiuve SE, McCullough ML, Sacks FM, Rimm EB. Healthy lifestyle factors in the primary prevention of coronary heart disease among men: benefits among users and nonusers of lipid-lowering and antihypertensive medications. Circulation. 2006;114(2):160–7.
27. Egger GJ, Binns AF, Rossner SR. The emergence of "lifestyle medicine" as a structured approach for management of chronic disease. Med J Aust. 2009;190(3):143–5.
28. Esselstyn CB, Jr, Gendy G, Doyle J, Golubic M, Roizen MF. A way to reverse CAD? J Fam Pract. 2014;63(7):356–64b.
29. Li WW, Li VW, Hutnik M, Chiou AS. Tumor angiogenesis as a target for dietary cancer prevention. J Oncol. 2012;2012:879623.
30. Liu RH. Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. Am J Clin Nutr. 2003;78(3):517–20.
31. Harvard Medical School. Division of Nutrition. 2018 [cited 2019 June 6]. Available from: http://nutrition.med.harvard.edu/.
32. American College of Lifestyle Medicine. Education. 2019 [cited 2019 May 31]. Available from: https://www.lifestylemedicine.org/ACLM/Education/ACLM/Education/Education.aspx?hkey=bec27dc0–9da5–4e38-b7da-8b7b090cfd7e.
33. Sayburn A. Lifestyle medicine: a new medical specialty? BMJ (Clinical research ed). 2018;363:k4442.
34. European Commission. Funding and tender opportunities. 2017 [cited 2019 May 31]. Available from: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/pj-01–2017.
35. Gustafson DI, Edge MS, Griffin TS, Kendall AM, Kass SD. Growing progress in the evolving science, business, and policy of sustainable nutrition. Curr Dev Nutr. 2019;3(6):nzz059.
36. BBC. Is milk healthy? Canada's new food guide says not necessarily. 2019 [cited 2019 June 30]. Available from: https://www.bbc.com/news/world-us-canada-46964549.
37. Jensen LL, Drozek DS, Grega ML, Gobble J. Lifestyle medicine: Successful reimbursement methods and practice models. Am J Lifestyle Med. 2019;13(3):246–52.
38. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension. 2018;71(6):e13-e115.
39. World Cancer Research Fund. Cancer prevention recommendations. 2019 [cited 2019 May 31]. Available from: https://www.wcrf.org/dietandcancer/cancer-prevention-recommendations.
40. World Cancer Research Fund. Recommendations during and after cancer. 2019 [cited 2019 May 31]. Available from: https://www.wcrf.org/dietandcancer/recommendations/during-after-cancer.
41. Jensen MD, Ryan DH, Apovian CM, et al. 2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults. Circulation. 2014;129(25 Suppl 2):S102–38.
42. Eyre H, Kahn R, Robertson RM. Preventing cancer, cardiovascular disease, and diabetes: a common agenda for the American Cancer Society, the American Diabetes Association, and the American Heart Association. CA: Cancer J Clin. 2004;54(4):190–207.

Author information

Carolina Rojido is a physician with certification for plant-based nutrition and a master's degree in health administration. She has 7 years of experience as a medical writer and one of her areas of expertise is nutrition and environmental sustainability.