# Examining the Correlation Between Lifestyle Factors and the Clinical Presentation of Multiple Sclerosis

Angel Prabakar, Nihal Alam, Olivia Guo, Angelina Yue, Nayounghee Tuetkin, Naomie Yehji Kim, Jocelyn Ho, Yunshu Zhang, Jovana Gonzalez, Alekhya Meduri

## Introduction

Multiple Sclerosis (MS) is an incurable neurodegenerative disease in which the immune system attacks the myelin sheath that protects nerve fibers, causing communication complications between the brain and body. This can result in disabilities in affected areas- lowering quality of life. While MS is a multifaceted disease that requires further investigation, a bibliometrics analysis aided in studying the impact of lifestyle habits on MS clinical presentation.

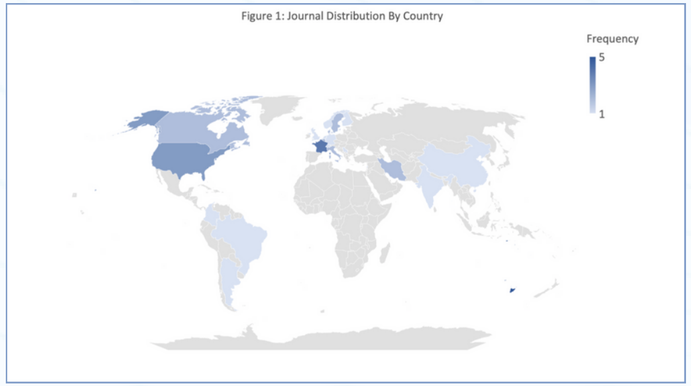
## Objectives

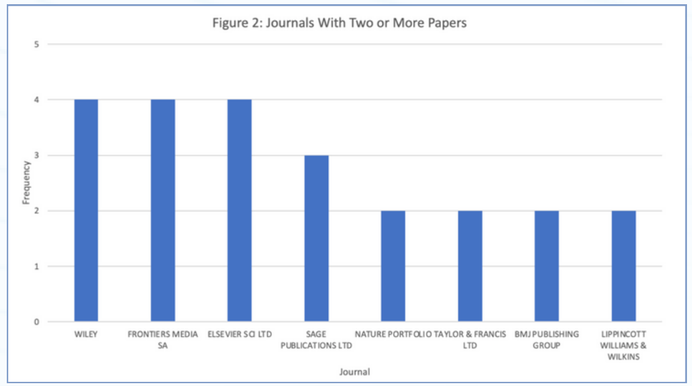
1. Examine the impact of different lifestyle factors on the clinical presentation and severity of MS
2. Review trends of influential factors in existing literature regarding MS onset and personal habits
3. Provide insight into potentially preventative lifestyle changes and suggestions for future research

## Results

Article publication dates range from 2006 to 2022. Four of 37 senior authors appear in over one publication with a maximum frequency of three. Two of 37 institutions published over one article, both of which produced three publications.

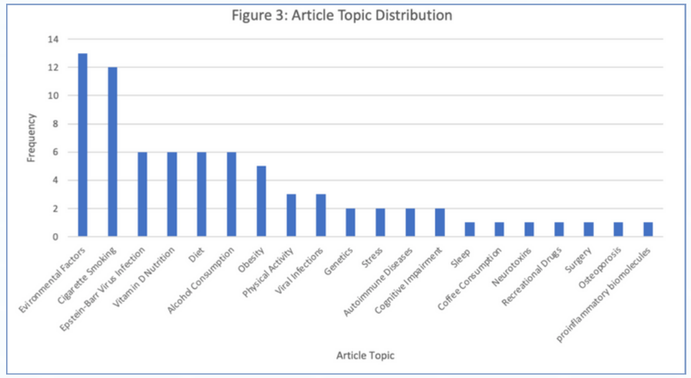
Publication origins span 22 countries as reflected in **Figure 1**.




Publications spanned 27 journals; as reflected in **Figure 2.**

Publications covered 20 correlations between lifestyle and MS, as shown in **Figure 3**.




## Discussion

The complexity of MS involves interplay between genetics and lifestyle factors such as vitamin D deficiency/overconsumption, smoking, obesity, and stress. Studies emphasize these contributions to disease onset, particularly the severe lack of vitamin D. This can be explained with an exploration of molecular mechanisms. According to the Journal of Allergy and Clinical Immunology, Vitamin D has an inverse relationship with the number of Interleukin-17-producing T Helper cells (TH17 cells). A lack of vitamin D causes a higher level of cell stimulation by the immune system. Potential recall bias and updates in MS studies makes defining specific prevention methods challenging. Nevertheless, actions such as maintaining proper vitamin D intake, decreasing tobacco use, and obesity management can support prevention methods. Future research should utilize these links and develop personal healthcare plans.

## Conclusion

MS, an autoimmune disease, is impacted by lifestyle choices. Through bibliometric analysis, key lifestyle factors were noted. The results show environmental factors and cigarette use were the most repeated key terms across the 42 studies, with a frequency of 13 and 12, respectively. Other common factors were unstable vitamin D levels, alcohol consumption, obesity and the Epstein-Barr virus. Preventative care includes daily exercise, maintaining healthy weight, and consumption moderation. The role of vitamin D in MS development was emphasized, aiming to clarify lifestyle choices and its influence on clinical presentation.

## References


- Ivashynka, Andrei, et al. “The Impact of Lifetime Alcohol and Cigarette Smoking Loads on Multiple Sclerosis Severity.” Frontiers, Frontiers, 26 July 2019, www.frontiersin.org/articles/10.3389/fneur.2019.00866/full.
- Medicine, aInstitute of Environmental. “Environmental Factors and Their Interactions with Risk...: Current Opinion in Neurology.” LWW, 2016, journals.lww.com/co-neurology/abstract/2016/06000/environmental_factors_and_their_interactions_with.14.aspx.
- Ponsonby, Anne-Louise, et al. “The physical anthropometry, lifestyle habits and blood pressure of people presenting with a first clinical demyelinating event compared to controls: The ausimmune study.” Multiple Sclerosis Journal, vol. 19, no. 13, 13 May 2013, pp. 1717–1725, https://doi.org/10.1177/1352458513483887.
- Willebrand, Ralf, and Markus Kleinewietfeld. “The Role of Salt for Immune Cell Function and Disease.” Immunology, U.S. National Library of Medicine, July 2018, www.ncbi.nlm.nih.gov/pmc/articles/PMC6002217/#:~:text=We%20now%20know%20that%20salt,1.