

Comprehensive Annotated Reference List

HIV and Yoga Studies

1. **Naoroibam, R., et al. (2016).** Effect of Integrated Yoga (IY) on psychological states and CD4 counts of HIV-1 infected patients: A randomized controlled pilot study. *International Journal of Yoga*, 9(1), 57-61.
 - PubMed: <https://pubmed.ncbi.nlm.nih.gov/26865772/>
 - Full text: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4728960/>
 - *This randomized controlled pilot study found that one month of integrated yoga intervention significantly reduced depression and significantly increased CD4 counts in HIV-1 infected adults.*
2. **Nair, P.M.K., et al. (2015).** Effects of naturopathy and yoga intervention on CD4 count of the individuals receiving antiretroviral therapy-report from a human immunodeficiency virus sanatorium, Pune. *Journal of Ayurveda and Integrative Medicine*, 6(3), 158-163.
 - PubMed: <https://pubmed.ncbi.nlm.nih.gov/26170591/>
 - Full text: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479889/>
 - *This study examined naturopathy and yoga as adjuvant therapy for people on antiretroviral treatment, showing improvements in CD4 counts and overall health parameters in a sanatorium setting.*
3. **Nair, P.M.K. (2019).** Naturopathy and Yoga as an Adjuvant for People Living With HIV/AIDS – A Case Series Report. *Explore (NY)*, 15(4), 291-294.
 - ScienceDirect: <https://www.sciencedirect.com/science/article/abs/pii/S1550830718301885>
 - *This case series demonstrates how naturopathy and yoga can be used as complementary therapy alongside conventional HIV treatment, showing positive outcomes in multiple patients.*
4. **Rao, R., Deb, U., Raghuram, N., et al. (2012).** Effects of an integrated yoga program on mood, perceived stress, quality of life and immune measures in HIV patients: a pilot study. *BMC Complementary and Alternative Medicine*, 12(Suppl 1), P235.
 - Full text: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3373530/>

- BioMed Central: <https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/1472-6882-12-S1-P235>
 - *This pilot study showed that an integrated yoga program improved mood, reduced perceived stress, enhanced quality of life, and positively affected immune measures in HIV patients.*
5. **Bhat, P.S., et al. (2019).** Effect of Yoga on Immune Parameters, Cognitive Functions, and Quality of Life among HIV-Positive Children/Adolescents: A Pilot Study. *International Journal of Yoga*, 12(2), 89-101.
- Full text: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6521755/>
 - *This pilot study with HIV-positive children and adolescents found that a 4-month yoga program including sun salutations and pranayama techniques significantly increased CD4 cells by 36.63%, decreased viral load, and improved the CD4/CD8 ratio by 42.05%.*
6. **Mawar, N., et al. (2015).** Sudarshan Kriya yoga improves quality of life in healthy people living with HIV (PLHIV): results from an open label randomized clinical trial. *Indian Journal of Medical Research*, 141(5), 670-679.
- Full text: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4405947/>
 - *This open-label randomized clinical trial demonstrated that Sudarshan Kriya yoga (a specific breathing technique) significantly improved quality of life measures in people living with HIV who were otherwise healthy.*
7. **Scott-Sheldon, L.A.J., et al. (2019).** The benefits of yoga for people living with HIV/AIDS: A systematic review and meta-analysis. *Complementary Therapies in Clinical Practice*, 34, 157-164.
- Full text: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6364312/>
 - ScienceDirect: <https://www.sciencedirect.com/science/article/abs/pii/S1744388118304092>
 - *This meta-analysis of seven studies found that people living with HIV who received yoga interventions reported significant improvements in perceived stress, positive affect, and anxiety.*

Meta-Analyses and Systematic Reviews on Meditation/Yoga and Immunity

8. **Xie, J., et al. (2020).** Immunological and Psychological Efficacy of Meditation/Yoga Intervention Among People Living With HIV (PLWH): A Systematic Review and Meta-analyses of 19 Randomized Controlled Trials. *Brain, Behavior, and Immunity*, 87, 249-260.
- PubMed: <https://pubmed.ncbi.nlm.nih.gov/33119732/>
 - ResearchGate: https://www.researchgate.net/publication/328816458_The_benefits_of_yoga_for_people_living_with_HIVAIDS_A_systematic_review_and_meta-analysis
 - *This comprehensive meta-analysis of 19 RCTs with 1,300 participants found that meditation/yoga interventions significantly improved CD4 T-cell counts and maintained them at follow-up, while also significantly reducing stress, depression, and anxiety symptoms and improving quality of life.*
9. **Creswell, J.D., et al. (2009).** Mindfulness meditation training effects on CD4+ T lymphocytes in HIV-1 infected adults: a small randomized controlled trial. *Brain, Behavior, and Immunity*, 23(2), 184-188.
- PubMed: <https://pubmed.ncbi.nlm.nih.gov/18678242/>
 - Academia.edu: https://www.academia.edu/71024652/Mindfulness_meditation_training_effects_on_CD4_T_lymphocytes_in_HIV_1_infected_adults_A_small_randomized_controlled_trial
 - *This UCLA study found a dose-response relationship between the amount of mindfulness meditation practice (including hatha yoga with poses like Uttanasana, Dandasana, Baddha Konasana, and Savasana) and CD4+ T cell counts—the more people practiced, the better their T cells performed.*
10. **Shields, G.S., et al. (2020).** The effect of mindfulness-based interventions on immunity-related biomarkers: a comprehensive meta-analysis of randomised controlled trials. *Clinical Psychology Review*, 79, 101875.
- ScienceDirect: <https://www.sciencedirect.com/science/article/abs/pii/S0272735822000095>
 - *This comprehensive meta-analysis examined the effects of mindfulness-based interventions on various immune biomarkers across multiple randomized controlled trials, providing evidence for immune system modulation through mindfulness practices.*

11. **Morgan, N., et al. (2014).** The Effects of Mind-Body Therapies on the Immune System: Meta-Analysis. *PLOS One*, 9(7), e100903.

- Full text: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0100903>
- *This meta-analysis examined various mind-body therapies including yoga and their effects on immune system function, finding positive impacts across multiple immune parameters.*

12. **ResearchGate publication (2024).** Impact of Yoga and Meditation on Immune System – A Systematic Review and Meta-Analysis.

- ResearchGate: https://www.researchgate.net/publication/386409125_Impact_of_Yoga_and_Meditation_on_Immune_System_-_A_Systematic_Review_and_Meta-Analysis
- *This recent systematic review and meta-analysis synthesizes current evidence on how yoga and meditation practices affect immune system function, providing updated findings on immunological outcomes.*

Inflammatory Markers and Immune Function

13. **Various Authors (2022).** Yoga, Meditation, Breathing Exercises, and Inflammatory Biomarkers with Possible Implications in COVID-19: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

- Full text: <https://pmc.ncbi.nlm.nih.gov/articles/PMC9568285/>
- *This systematic review and meta-analysis found that yoga can downregulate pro-inflammatory markers, particularly decreasing IL-1beta and showing reductions in IL-6 and TNF-alpha, which has implications for inflammatory conditions including COVID-19.*

Vagus Nerve, Parasympathetic Nervous System, and Yoga

14. **Gerritsen, R.J.S., & Band, G.P.H. (2018).** Breath of Life: The Respiratory Vagal Stimulation Model of Contemplative Activity. *Frontiers in Human Neuroscience*, 12, 397.

- Full text: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6189422/>
- *This paper presents the Respiratory Vagal Stimulation Model, explaining how breathing practices in contemplative activities like yoga directly stimulate the*

vagus nerve and activate the parasympathetic nervous system, with diaphragmatic breathing and extended exhales shown to increase healthy vagal tone.

15. **Streeter, C.C., et al. (Various).** Research on vagal tone and yoga (referenced in Kripalu article).

- Kripalu Center article: <https://kripalu.org/resources/why-yoga-works>
- *Dr. Streeter's research explores the relationship between yoga practice and increased vagal tone, explaining the neurophysiological mechanisms by which yoga affects the autonomic nervous system and promotes relaxation and stress reduction.*

16. **Kalyani, B.G., et al. (2011).** Study on chanting and vagus nerve stimulation (referenced in multiple sources).

- Discussed in: <https://www.doctor-yogi.com/yoga-anatomy-blog/2022/6/16/parasympatheticnervoussystem>
- *This study examined how vocal practices like chanting in yoga stimulate the vagus nerve through vibrations in the throat and chest, contributing to parasympathetic nervous system activation and the calming effects of yoga practice.*

17. **Sujan, M.U., et al. (2015).** Bhramari pranayama increases parasympathetic activity (referenced in multiple sources).

- Discussed in: <https://www.doctor-yogi.com/yoga-anatomy-blog/2022/6/16/parasympatheticnervoussystem>
- *This research demonstrates that Bhramari pranayama (humming bee breath) specifically targets and activates the vagus nerve through its branches that innervate the pharynx, larynx, and diaphragm, with the soothing vibrations enhancing parasympathetic nervous system activity.*

18. **Brown, R.P., & Gerbarg, P.L. (2009).** Psychophysiological effects of various breathing techniques used in Sudarshan Kriya Yoga (referenced in academic article).

- Referenced in: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6189422/>
- *This work examines the psychophysiological effects of different breathing techniques, particularly Sudarshan Kriya Yoga, showing how specific*

pranayama patterns affect the autonomic nervous system, stress hormones, and mental health outcomes.

Popular Science and Educational Resources

19. Live Science (2022). Does yoga really stimulate the vagus nerve? Here's what the science says.

- Article: <https://www.livescience.com/does-yoga-stimulate-the-vagus-nerve>
- *This science journalism article reviews the evidence for yoga's effects on vagus nerve stimulation, explaining that while the mechanisms are still being researched, yoga practices—especially those involving controlled breathing and stress reduction—likely inhibit the release of stress hormones like norepinephrine, which makes immune cells less vulnerable.*

20. YogaU Online (2025). Yoga and the Vagus Nerve.

- Article: <https://yogauonline.com/yoga-practice-teaching-tips/yoga-research/yoga-and-the-vagus-nerve/>
- *This educational resource explains the connection between yoga practices and vagus nerve function, discussing how specific poses and breathing techniques can enhance vagal tone and promote parasympathetic dominance for better health and stress management.*

21. YogaU Online (2025). 6 Vagus Nerve Exercises to Boost Well-being.

- Article: <https://yogauonline.com/yoga-practice-teaching-tips/yoga-practice-tips/6-ways-to-stimulate-your-vagus-nerve-with-yoga-and-breathing/>
- *This practical guide provides six specific yoga exercises designed to stimulate the vagus nerve, including breathing techniques and poses that activate the parasympathetic nervous system to reduce stress and enhance overall wellbeing.*

22. Dr. Arielle Schwartz (2024). Vagus Nerve Yoga for Balance.

- Article: <https://drarielleschwartz.com/vagus-nerve-yoga-dr-arielle-schwartz/>
- *Dr. Schwartz, a clinical psychologist specializing in trauma and somatic psychology, explains how specific yoga practices can be used therapeutically to balance the autonomic nervous system through vagus nerve stimulation, particularly helpful for trauma recovery and stress resilience.*

23. **Ekhart Yoga (2021)**. How to stimulate your vagus nerve to reduce stress and anxiety.

- Article: <https://www.ekhartyoga.com/articles/wellbeing/how-to-stimulate-your-vagus-nerve-to-reduce-stress-and-anxiety>
- *This article provides accessible explanations and practical yoga techniques for vagus nerve stimulation, focusing on poses and practices that help reduce stress and anxiety through parasympathetic nervous system activation.*

24. **Cranial Osteopath (2025)**. Stress And The Vagus Nerve: Yoga To Rest And De-Stress.

- Article: <https://cranial-osteopath.com/vagus-nerve-yoga/>
- *This resource from an osteopathic perspective explains how yoga poses—particularly inversions like half shoulderstand that stimulate the thymus and thyroid, and restorative poses like Supta Baddha Konasana and supported bridge pose—activate the parasympathetic nervous system by affecting vagus nerve connector cells in the brainstem and sacral spinal cord.*

25. **International Journal of Current Science Research and Review (2021)**. Effect of Yoga Pranayama (Breathing Techniques) on the Vagus Nerve in Countering Major Depression and Related Ailments; A Literature Review.

- Article: <https://ijcsrr.org/effect-of-yoga-pranayama-breathing-techniques-on-the-vagus-nerve-in-countering-major-depression-and-related-ailments-a-literature-review/>
- *This literature review examines evidence for how specific pranayama techniques including Kapalabhati, Anuloma Viloma (alternate nostril breathing), and Bhramari affect the vagus nerve and can help counter depression and related mental health conditions through enhanced parasympathetic nervous system function.*

26. **Kundalini Research Institute (2023)**. Yoga for HIV: Still a Relevant Adjunct Therapy.

- Article: <https://kundaliniresearchinstitute.org/en/blog/yoga-for-hiv-still-a-relevant-adjunct-therapy/>
- *This article discusses the continuing relevance of yoga as an adjunct therapy for people living with HIV, reviewing research on how yoga practices support immune function and quality of life, and noting the historical use of yoga in HIV/AIDS programs at institutions like Harvard's Beth Israel Deaconess*

Medical Center, which had been using yoga for 14 years to achieve the "relaxation response" and counteract stress's effects on the immune system.

Summary Notes

References 1-7 cover HIV-specific yoga interventions and their effects on CD4 counts, viral load, psychological wellbeing, and quality of life, including studies with children, adolescents, and adults.

References 8-13 are meta-analyses and systematic reviews examining broader immune system effects, including inflammatory markers and immunological outcomes across multiple studies.

References 14-18 cover the scientific mechanisms of vagus nerve stimulation and parasympathetic activation through yoga and breathing practices, providing the neurophysiological basis for how these practices work.

References 19-26 are educational resources and literature reviews that explain practical applications of vagus nerve stimulation through yoga, making the science accessible for practitioners and providing specific techniques and poses.