

Sufficient Sleep, Time of Vaccination, and Vaccine Efficacy: A Systematic Review of the Current Evidence and a Proposal for COVID-19 Vaccination

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Abstract

Introduction: The emergence of the novel Coronavirus Disease 2019 (COVID-19) sparked an unprecedented effort to develop effective vaccines against the disease. Some factors may boost the vaccine efficacy, including sufficient sleep and morning vaccination. We aimed to conduct a rapid systematic review to summarize data regarding the association between sleep and time of vaccination with immunity after vaccination. **Materials and Methods:** The systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, and three databases (pubmed, Web of Science, and Scopus) were searched up to March 12, 2022. **Results:** Eight studies were included regarding the sleep and immune response after vaccination, of them, five studies were on influenza, two studies on hepatitis A (HAV), and one study on hepatitis B. Accordingly, six out of eight studies found a positive correlation between sleep and immune response after vaccination. Regarding the time of vaccination, seven studies were eligible to be included (two studies on influenza, one study on HAV and influenza, one study on BCG, one study on hexavalent vaccine, and two studies on SARS-cov-2 vaccine). Among them, four out of seven studies (including a study on SARS-cov-2 inactivated vaccine) reported the priorities of morning versus afternoon vaccination regarding antibody production and immune response after vaccination. **Conclusion:** Taken together, cumulative evidence suggests that sufficient sleep and vaccination in the morning could enhance the immune response after vaccination. Hence, modulating the time of vaccination and sufficient sleep could be a simple and applicable strategy for increasing vaccine efficacy. Future studies could be performed with SARS-cov-2 vaccines to investigate the effects of time of vaccination and sufficient sleep on COVID-19 vaccine efficacy.

Keywords: COVID-19, SARS-cov-2, vaccine, morning vaccination, sleep, circadian rhythm