

### The Impact of Tryptophan Supplementation on Sleep Quality: A Systematic Review, Meta-Analysis and Meta-Regression

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**Objectives:** Sleep disturbances have been associated with higher risk of developing a range of health conditions such as impaired cognition, type 2 diabetes mellitus and cardiovascular disease. L-tryptophan (Trp) has been documented to aid sleep, but a systematic compilation of its effect on sleep quality is still limited. This study aimed to assess the effect of Trp supplementation on sleep quality via meta-analysis and meta-regression. The effects of Trp dose (<1 g and  $\geq$  1 g) was also assessed.

**Methods:** A database search was done in PubMed, Medline (Ovid), CINAHL and COCHRANE and a total of 18 articles were collected. Sleep outcomes that were observed include total sleep time (TST), sleep latency (SL), wake after sleep onset (WASO) and sleep efficiency (SE). Extracted data from four articles were also analyzed using

random-effect meta-analysis and meta-regression. Standardized mean difference (SMD) was used in meta-analysis. To investigate the dose-dependent efficacy of Trp, the post-intervention sleep outcomes from 18 articles were extracted and categorized into two Trp dose groups: <1g and  $\geq$ 1g. This was then followed by an independent t-test comparison.

**Results:** Results from the study suggested that Trp supplementation can shorten WASO [SMD = 1.08 min, 95%CI (-1.89, -0.28); -81.03 min/g, *P*-value = 0.017]. In addition, the group with  $\geq$  1g Trp supplementation displayed a shorter WASO than the group with Trp < 1g supplementation (Trp < 1g vs. Trp  $\geq$  1g: 56.55 mins vs. 29.91 mins; *P*-value: 0.001). However, Trp supplementation did not affect other sleep components.

**Conclusions:** Trp supplementation, especially at  $\geq$  1g, can aid in improving sleep.

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