



Abstract

# Walnut Consumption Improves Sleep Quality: A Randomized-Controlled Trial <sup>†</sup>

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**Abstract:** Diet and sleep are two factors intrinsic to health which influence each other. For instance, diet may influence sleep via melatonin and its biosynthesis from tryptophan. Experimental data exist indicating that the provision of specific foods rich in tryptophan or melatonin can improve sleep quality. Walnuts are nutrient-dense foods that have a unique nutritional profile, including tryptophan and melatonin. However, clinical trials are needed to confirm the causal impact of walnuts on sleep and elucidate the underlying mechanisms. Therefore, our aim was to determine whether the daily consumption of walnuts could have a positive impact on sleep quality. Methodology: In this randomized cross-over trial (NCT04799821), 80 young adults ( $24.1 \pm 3.9$  years; 85.5% women) either ingested 40 g of walnuts daily (intervention) or refrained from eating walnuts or any other nuts (control) for 8 weeks, with a washout period of 2 weeks. The outcome variables included sleep quality, measured with actigraphy (duration, latency, wake after sleep onset (WASO), awakenings, and efficiency), daytime sleepiness (Epworth Sleepiness Scale), and the melatonin metabolite, 6-sulfatoxymelatonin (6-SMT), which was determined in urine samples collected (a) from 20:00 to 23:00 and (b) from 23:00 to 7:00. Results: The 8-week intervention with walnuts was significantly associated with an improvement in sleep quality ( $p = 0.033$ ). Notably, the intervention was significantly associated with lower sleep latency ( $p = 0.003$ ), higher sleep efficiency ( $p = 0.022$ ), and less daytime sleepiness ( $p = 0.004$ ). Furthermore, at the end of the intervention, the concentration of 6-sulfatoxymelatonin in urine samples from 20:00 to 23:00 was significantly higher ( $p = 0.024$ ), whilst no differences were shown between the baseline and control conditions. Discussion: These data suggest that a daily serving of 40 g of walnuts provides an increase in melatonin which can be beneficial in improving sleep quality and in reducing daytime sleepiness in healthy young adults. However, more studies are needed to explain the mechanisms underlying this association.

**Keywords:** sleep quality; walnuts; 6-sulfatoxymelatonin



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