

Transcranial Photobiomodulation Therapy as an Intervention for Opioid Cravings and Depression: A Pilot Cohort Study

Abstract

Introduction: The opioid crisis, a declared national health emergency, has prompted the exploration of innovative treatments to address the pervasive issues of opioid cravings and associated depression.

Aims: This pilot cohort study investigated the efficacy of transcranial Photobiomodulation (tPBM) therapy using the SunPowerLED helmet to alleviate these symptoms in individuals undergoing treatment for opioid addiction at a rehabilitation center in West Virginia.

Methods: Employing a quasi-experimental design, this study enrolled participants into two groups: one receiving tPBM therapy alongside standard care and a control group receiving standard care alone. The helmet features include the following: total wavelength = 810 nm, total irradiance = 0.06 W/cm² (60 m W/cm²), and total fluence = 172.8J/cm².

Results: The results of the Wilcoxon signed-rank tests for within-group analysis and Mann–Whitney U tests for between-group comparisons revealed statistically significant reductions in the intensity ($W = 7.36, p = 0.012$), time ($W = 6.50, p = 0.015$), frequency ($W = 6.50, p = 0.010$), and total scores of opioid cravings ($W = 7.50, p = 0.009$), as well as improvements in depression symptoms ($W = 8.00, p = 0.005$) within the PBM group compared to the non-PBM group.

Discussion: These findings suggest that transcranial PBM therapy could be a promising noninvasive intervention for reducing opioid cravings and depressive symptoms in individuals with opioid use disorder, warranting further investigation through larger randomized controlled trials.