

Type of therapy	Definition
Exercise therapy	We operationally defined exercise as planned, structured, and repetitive bodily movement performed to improve or maintain one or more components of physical fitness ^[1] . The exercise therapies included in this study covered multiple exercise modalities, such as aerobic exercise, resistance exercise, and combined exercise, among others.
Cognitive behavior therapy (CBT)	CBT is an evidence-based psychological intervention aimed at evaluating, challenging, and modifying a patient's dysfunctional beliefs ^[2] . The therapist mostly emphasizes homework assignments and outside-of-session activities with topics to cope with stressful situations.
Nutritional intervention	Nutritional interventions include micronutrients, amino acids, multivitamin formulations, microbiota-targeted therapies, and whole-diet patterns that may alleviate long COVID fatigue by targeting inflammation and gut dysbiosis ^[3] .
Non-invasive neuromodulation	Non-invasive neuromodulation encompasses techniques that modulate neural activity through either central or peripheral pathways, including non-invasive brain stimulation (e.g., transcranial magnetic stimulation [TMS] and transcranial electrical stimulation [tES]) and peripheral nerve stimulation modalities (e.g., non-invasive vagus nerve stimulation [nVNS], supraorbital transcutaneous stimulation [STS], remote electrical neuromodulation [REN], and external trigeminal nerve stimulation [e-TNS]) ^[4] .
Control group	The control group received placebo, usual care, waitlist, or no intervention

References

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- [2] THOMA N, PILECKI B, MCKAY D. Contemporary Cognitive Behavior Therapy: A Review of Theory, History, and Evidence [J]. Psychodynamic psychiatry, 2015, 43(3): 423-461.
- [3] BIGMAN G, RUSU M E, SHELAWALA N, et al. A Comprehensive Scoping Review on Diet and Nutrition in Relation to Long COVID-19 Symptoms and Recovery [J]. Nutrients, 2025, 17(11).
- [4] KE D, CHEN M, DAN X, et al. Effectiveness of neuromodulation techniques for migraine prophylaxis: a systematic review and network meta-analysis of randomized controlled trials [J]. BMC Complementary Medicine and Therapies, 2026, 26(1): 74.