

Brief weekly magnetic muscle therapy improves mobility and lean body mass in older adults

May 23 2023



Since starting the weekly BIXEPS sessions, 73-year-old housewife Mrs Yvette Cheak (seated) experienced less swelling at her ankle knee, and she became more energetic. On some days, she is able to walk at home without a walking stick. Credit: National University of Singapore

A decline in functional mobility, loss of muscle strength and an increase

in body fats are often associated with aging. This trend could potentially be reversed by way of an innovative magnetic muscle therapy pioneered by researchers from the National University of Singapore (NUS).

In a recent community study conducted in Singapore involving 101 participants aged between 38 to 91 years old, weekly exposure to very low levels of proprietary pulsed electromagnetic field (PEMF), using the BIXEPS device invented by NUS researchers in 2019, is associated with significant improvements in mobility and body composition after 12 weeks, particularly in [older persons](#). Participants also reported reduced perception of pain after three months of magnetic muscle therapy.

The community trial was carried out jointly by researchers from the NUS Institute for Health Innovation & Technology (iHealthtech), NUS start-up QuantumTX, and Healthy Longevity Translational Research Program under the NUS Yong Loo Lin School of Medicine.

Leader of the research team Associate Professor Alfredo Franco-Obregón, who is a Principal Investigator with NUS iHealthtech and co-founder of QuantumTX, said, "We are very encouraged by the positive results of this community trial. PEMF-associated improvements were experienced by 85% of participants, irrespective of age, with the greatest benefits reported in older and more frail participants. Our findings suggest that PEMF therapy can produce comparable results to exercise in older persons and therefore holds potential therapeutic value for the older adult population."

The research team reported the results of the community trial in scientific journal *Aging* on 19 March 2023.

Benefits of magnetic muscle therapy

The BIXEPS device targets the muscles in a user's leg with a specific

magnetic signature and creates metabolic activity in the cells similar to when a person exercises. Earlier studies by Assoc Prof Franco-Obregón and his team had shown that participants who received the magnetic muscle therapy of one leg after [knee surgery](#) exhibited improvements in whole body metabolism, predominantly reflected as changes in blood lipid profiles. That is, the effect spread beyond just the treated leg and produced system wide improvements.

Positive results from community trial

The community study was conducted over 34 months, from 1 January 2020 to the 31 October 2022. Among the 101 volunteers who participated in the study, 62% were females and 38% were males. Of the participants, 87% had pre-existing mobility dysfunction and 13% were healthy individuals.

Participants were given the proprietary BIXEPS therapy for 10 minutes once a week on alternate legs each week, for a period of 12 weeks. Each participant completed a series of standard performance-based functional tests and indicated their existing acute and chronic pains at the start (week 1) and end (week 12) of the program.

Data on each participant's body composition—such as weight, skeletal muscle mass, body fat mass, and visceral fat area—were collected before each weekly session.

After eight weeks of treatment, 72% of participants reported improved maintenance of skeletal muscles in conjunction with reductions of total and visceral fats, together with 85% of participants showing improvements in functional mobility after 12 weeks, most significantly in the elderly. These positive results provide evidence that this PEMF-based technology may represent a valuable therapy to boost conventional geriatric interventions intended to reduce the prevalence of frailty and

metabolic disorders in the older adult population.

Very importantly, visceral fat is the inflammatory fat and is associated with a large range of metabolic disorders, including diabetes. Previous studies have shown that people in Southeast Asia hold on to visceral fat more stubbornly than other parts of the world despite exercise. The result is that people in Southeast Asia develop diabetes at a lower Body Mass Index (BMI) than other demographics. This has posed a real problem for the health industry in South East Asia. "We may finally have a solution to this local healthcare dilemma in the form of magnetic field therapy," noted Assoc Prof Franco-Obregón.

Mrs. Yvette Cheak, a 73-year-old housewife, who participated in the study in September 2021, used to have a weak right leg and a buckling knee in the same leg. "Since using BIXEPS, there was less swelling at the ankle and knee, and I became more energetic. My knee is also less painful and doesn't buckle as much. On some days, I am able to walk at home without a walking stick."

"Prior to the BIXEPS program, I had a lot of weakness in my legs. It was painful in my hip and feet when I took even a few steps. I could not climb the stairs the normal way, and had to rely on the handrails to balance myself," recalled 79-year-old retiree Mr. George Teo. "At the end of 12 sessions, I felt that my leg movement had returned to normal, and I could go up and down the stairs without using the handrails."

Next steps

Building on the positive findings of the community study, the team has engaged with research teams in the U.S. and Hong Kong to conduct randomly controlled clinical trials to further validate the benefits for frailty across different aging-populations. Since 2022, the team has also started a senior-focused study with 200 seniors across four community

care centers in Singapore to evaluate how the technology can improve function and alleviate chronic pains. This study is expected to complete in 2023.

Real-world pilot data from existing community programs have also shown promise of better controlled HbA1c—the prevalent marker for diabetes progression—after starting on weekly BIXEPS sessions. The research team is currently working with the Singapore General Hospital to conduct a clinical trial to further investigate the possible therapeutic possibility for PEMF-based therapies to manage diabetes progression.

More information: Sharanya Venugobal et al, Brief, weekly magnetic muscle therapy improves mobility and lean body mass in older adults: a Southeast Asia community case study, *Aging* (2023). [DOI: 10.18632/aging.204597](https://doi.org/10.18632/aging.204597)

Provided by National University of Singapore

Citation: Brief weekly magnetic muscle therapy improves mobility and lean body mass in older adults (2023, May 23) retrieved 17 April 2024 from <https://medicalxpress.com/news/2023-05-weekly-magnetic-muscle-therapy-mobility.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.