



## Comment on “Treatment of diabetic foot ulcers in a frail population with severe co-morbidities using at-home photobiomodulation laser therapy: a double-blind, randomized, sham-controlled pilot clinical study”

Gislene de Freitas Franco<sup>1</sup> · Lincoln Almeida Souza<sup>2</sup> · Mariana Bernardes Batista Monteiro<sup>2</sup> · Gabriela Godinho Gutierrez<sup>2</sup> · Adriana Lino dos Santos Franco<sup>1</sup> · Maria Fernanda Setúbal Destro Rodrigues<sup>1</sup> · Rebeca Boltes Cecatto<sup>1,3</sup>

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Dear Editor,

It was a great pleasure to read the recent article published in *Lasers in Medical Science* by Haze et al. [1]. This elegant study raises important points of view about at-home photobiomodulation (PBM) for the recovery of diabetic foot ulcers, one of the most important causes of disability in chronic patients. The study shows great results in-home therapy for frail patients that need complex treatment. It is mainly important because patients with sequelae of disabling

chronic diseases, especially neurological sequelae, wounds and healing ulcers, chronic pain, osteoarthritis, fibromyalgia, and lymphedema need, all of them, long-term intensive rehabilitation. Therefore, looking for outside treatments from hospitals or clinics appears as an important part of the healthcare of impaired people [2]. A personalized training program in a home environment can increase motivation, adherence, decrease costs to the health system, and improve the functionality and quality of life of this population [3].

We would like to congratulate this published study, although all the guidelines for such kinds of care are still lacking in previous studies. In this sense, since March 2022, our research group has been working on a pioneering systematic review protocol that seeks to evaluate the effectiveness of home-use photobiomodulation-based therapies in the rehabilitation of people with chronic disabilities. We are particularly interested in self-applied protocols of photobiomodulation for chronic pain such as fibromyalgia or myofascial pain, chronic ulcers, muscle ruptures, lymphedema, mono and paraplegia, gait or motor impairments, and neuropathies. Our PRISMA [4] protocol is properly registered on the PROSPERO website before the data extraction by number CRD42022326588 and includes a wide search strategy (Supplementary Material) on PUBMED, EMBASE, LILACS, Open Gray, Proquest, International Network of Agencies for Health Technology Assessment (INAHTA), LIVIVO, Agency for Healthcare Research and Quality Technology Assessments (AHRQ), Food and Drug Administration (FDA) and Health Evidence Network (WHO HEN) databases, following a P.I.C.O. strategy. After an initial search, we founded, in May 2022, 4071 studies to evaluate the inclusion criteria. Clinical trials, case reports, guidelines, health policies, and observational studies evaluating

✉ Rebeca Boltes Cecatto  
rebeca.boltes@gmail.com; rebeca.boltes@hc.fm.usp.br

Gislene de Freitas Franco  
gislenefreitasfranco@gmail.com

Lincoln Almeida Souza  
souzalincoln.las@gmail.com

Mariana Bernardes Batista Monteiro  
marianabm1994@gmail.com

Gabriela Godinho Gutierrez  
gg.gutierrez@uni9.edu.br

Adriana Lino dos Santos Franco  
adrilino@uni9.pro.br

Maria Fernanda Setúbal Destro Rodrigues  
fernandarodrigues@uni9.pro.br

- <sup>1</sup> Health Sciences, Universidade Nove de Julho/UNINOVE, 249 Vergueiro Street, SP 01504-001 Liberdade, São Paulo, Brazil
- <sup>2</sup> School of Medicine, of Universidade Nove de Julho UNINOVE, 249 Vergueiro Street, Liberdade, São Paulo, SP 01504-001, Brazil
- <sup>3</sup> Rehabilitation Service of the, Instituto Do Câncer Do Estado de Sao Paulo School of Medicine of the University of Sao Paulo, Sao Paulo 01246-903, Brazil

the use of PBM in patients with physical chronic impairments of any etiology will be included for analysis. Moreover, available data about the quality of life, functionality, or degree of independence will be reported. Quality analysis of the included studies will be carried out, according to the PRISMA guidelines [4], the LLLT/photomedicine Guideline published by Jenkins and Carroll [5], and according to WALT recommendations [6]. A qualitative descriptive analysis of the collected data is planned, but once the number of patients in published studies is in general limited, to come to a more accurate assertion if a minimum of two studies with the same material, same condition, therapy, and results are found, we plan to perform a quantitative synthesis (meta-analysis) of the subgroups of symptoms, functionality, and quality of life outcomes.

As per the Haze et al. [1] study, previous published well-designed reviews have already pointed out that home photobiomodulation is a safe and effective technique for improving numerous clinical conditions [7]. Moreover, the COVID-19 pandemic highlights the urgency of using the home environment for the continuity of health care, which led to the publication of many studies on home-based therapies in the last 2 years. Besides this, photobiomodulation is a simple, low-cost treatment that brings numerous benefits to the patient and could be safely used at home. So, an extensive review can bring new insights and directions about the dosimetry needed for the best results, the most promising indications, and the long- and medium-term effects for this specific population. We expect that this innovative systematic review protocol, rigorously designed by the PRISMA methodology, evaluating the literature in a very broad way with clearly defined population and objectives, will corroborate the promising results of the Haze et al. study [1], bringing contributions to photobiomodulation therapy as well as to rehabilitation medicine and home care of the population with disabilities.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10103-022-03595-z>.

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