



ADVANCING TECHNOLOGY-SUPPORTED PREHABILITATION: evidence, patient perspectives and conditions for implementation

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PUBLIC PHD DEFENCE FOR THE DEGREE OF
DOCTOR IN REHABILITATION SCIENCES AND PHYSIOTHERAPY

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VANDENDRIESSCHE AUDITORIUM, VUB Health Campus, Building A

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ABSTRACT OF THE RESEARCH

Successful elective orthopaedic surgery begins well before the operating room. People with musculoskeletal conditions awaiting surgery often face pain, reduced physical function, muscle weakness and psychological distress, all of which may influence recovery. Prehabilitation aims to improve modifiable factors before surgery, and digital technologies may help deliver these programmes at home through guidance, monitoring and feedback.

This PhD project investigated how technology-supported prehabilitation can contribute to care before elective orthopaedic surgery. It examined whether these programmes improve patient outcomes, how the added value of technology can be distinguished from the rehabilitation programme itself, how patients experience technology-supported prehabilitation, and what may facilitate or hinder its future implementation.

The available evidence suggests that technology-supported prehabilitation may improve several outcomes before and shortly after surgery, although the certainty of this evidence remains limited. To better understand what technology itself adds, the thesis also designs a programme in which the rehabilitation content is kept the same while only the mode of delivery (digitally-supported or not) differs.

Patients who used the technology-supported programme generally considered it useful and compatible with preparing for surgery at home. At the same time, technical reliability, equipment burden, initial familiarisation and the way automated feedback is delivered emerged as important aspects to improve before wider implementation.

The thesis also shows that prehabilitation cannot be evaluated separately from the perioperative pathway around it. Perioperative care is often insufficiently described, making it difficult to understand the context in which outcomes are achieved and whether interventions can be transferred to other settings.

Overall, this thesis proposes that technology-supported prehabilitation should be considered and evaluated as a complex model of intervention embedded within a wider care pathway. Its value depends on the therapeutic content delivered, what functions the technology enables, how patients experience it, and how well it fits within the surrounding healthcare system.

CURRICULUM VITAE

Stefania Guida graduated as a physiotherapist from the Università degli Studi dell'Insubria (Varese, Italy) in 2019. In 2021, she obtained her Master's degree in Rehabilitation Sciences from Università Vita-Salute San Raffaele (Milan, Italy). Combining clinical practice with a deep interest in research, in 2022 she began her research career as a Junior Researcher at IRCCS Ospedale Galeazzi-Sant'Ambrogio, and her PhD with the Vrije Universiteit Brussel. Since then, her research has focused on prehabilitation, digital technologies and optimization strategies for perioperative pathways in the orthopaedic field. Beyond this primary research focus, she trained and developed expertise in research methodology and became involved, as methodological support, in the development of secondary research projects, both within IRCCS Ospedale Galeazzi-Sant'Ambrogio and through other national and international collaborations. Beyond research, she runs a multidisciplinary outpatient clinic in Italy, where she combines clinical leadership with the translation of evidence-based physiotherapy into practice.

