Wearable textile based system for pelvic floor training - state of the art and concepts for novel prototypes

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Abstract

Pelvic floor muscle training plays an important role in the prevention of pelvic floor disorders and may improve quality of life while reducing healthcare burden. Many women are unable to control their pelvic floor muscles correctly without professional guidance, which limits the effectiveness of preventive strategies. This problem is further compounded by the limited and uneven availability of specialized physiotherapy care, particularly in the Sachsen–Czech border region.
This work begins with an overview of the state of the art and previous developments of pelvic floor diagnostic systems. The core of the work is concepts and first prototypes of a novel, non-invasive diagnostic and training textile-based system, designed to assess pelvic floor muscle function and provide feedback on its correct performance. Its long-term goal is a transition from prototype to a fully wearable solution, such as sensor-integrated underwear suitable for clinical and home use.

We focus on transforming the system into a textile-based solution, such as smart underwear, designed for comfortable, washable, and reusable daily use. The ideal garment must be adjustable across different body types, available in multiple sizes, connected to a wearable platform with a mobile application, enabling real-time feedback, guided training, and remote monitoring, thereby supporting both home-based pelvic floor training and clinical use.

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