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Intimate Care: Exploring eTextiles for Teaching Female Pelvic Fitness

Abstract
Intimate care is integral to the lifecourse, and it includes care tasks that are linked to personal hygiene, bodily functions and products. In this paper, we explore the potential of eTextiles as catalysts for conversations around intimate care. We designed a kit that integrates eTextiles as the core material to teach and learn about intimate parts of the self and to support body literacy. We deployed this design kit in an educational context, with a group of six female participants aged 15-16. We suggest avenues for future research within health and wellbeing, in combination with smart, wearable materials.

Introduction
HCI has explored many of the ways in which we can care for our bodies through notions of personal care (such as fitness, nutrition, and rest). In this paper, we propose that HCI research must further extend the lens of personal care to examine the body as a site of
intimate care. Intimate care has been defined as “those care tasks associated with personal hygiene, bodily functions and bodily products, which demand direct or indirect contact with or exposure of the sexual parts of the body as defined culturally by the individual [11]”. Examples of intimate care might include feeding or toileting support and daily rituals such as grooming, washing, and eating are all ways we care for ourselves. Intimate care also includes preventative health practices such as continence care and oral care.

We position our approach in the construction of a design kit that enables conversations around intimate care. It does so by emphasizing learning of the body through making, exploring the material landscape of electronic textiles (eTextiles), embedding electronics and tangible interaction into fabric. This is to demonstrate different states of the body (morphology) and stimulate proactive behavior to safeguard future health (pelvic floor muscle exercises). We present design work for intimate care with six female participants, aged 15-16, exploring technologies to support pelvic floor health. We designed and deployed a design kit that supports body literacy through electronic textiles. By relating technology to everyday life in an educational context - in the form of wearable, on-body technologies, we apply smart and soft materials in support of health and wellbeing in relation to intimate parts of the self. Our aim is to suggest avenues for future research within health and wellbeing, in combination with computational textiles.

**Related Work**

HCI has long been studying and developing technologies for health and wellbeing [8]. Health-related mobile applications continue to proliferate, and self-tracking technologies are being used to monitor personal health and craft self-understandings [2]. These technologies advocate self-knowledge of personal and intimate care, document daily rituals and incite behaviours such as good nutrition or pelvic floor muscle exercising. The technology is wearable, portable, and mobile. It provides numerous data and stimulates change in habits and routines. In contrast, our work focuses on methods to explore embodiment and make tangible the internal landscape and hidden parts of the body. While sexuality and intimacy have received increased attention in HCI literature over the past few years [4], there has been a relative absence of HCI research exploring how interactive systems and digital interactions might support health and wellbeing in relation to intimate parts of the self. Research and design in these areas is generally considered to be laden with emotion as well as potentially risky for the individuals involved [7]. Consequently, intimate care, as a practice and a research agenda, is often invisible.

Similar to [9], research that innovates methods and promotes body literacy among children and within a school environment, we explore wearable eTextiles (electronic textiles) as a new approach to teaching and learning about anatomy and physiology. The prototype in [9] aims to make tangible unseen parts of the body and employs computational textiles to deliver such an interactive experience of “body organs”. At the same time, it explores engagement and learning with technology to stimulate knowledge of organs that “are invisible and untouchable”. We expand this work by making tangible unseen but also intimate parts of the body, those that are primarily problematized by touch and visibility. Computational textiles have been introduced as a medium to introduce technology in
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**Exploring Female Pelvic Fitness**

We delivered a design workshop with a group of six female participants, aged 15-16, in a secondary school. The workshop included two activities, a body mapping and a DIY wearable eTextiles activity. It included introducing and exploring the role of the pelvic floor muscle in continence prevention, core stability, and overall health. Maintaining good function in the pelvic floor throughout life is desirable, and our aim is to explore a new approach to teaching about these hidden parts of the body within an educational environment, and at an early age. We do so through a mixture of making activities and working with wearable technologies (see Side Bar).

**Body Mapping**

To engage the participants in the topic of pelvic floor and to encourage them to use biological language relating to their sexual organs, our first activity was a body mapping exercise. Body maps, a qualitative method generally employed by medical anthropologists, can be used to exercise knowledge and access people’s perceptions of their bodies. Participants worked in pairs to create and discuss a body map. The body map was framed for intimate care with a pair of knickers, and participants were asked to illustrate their reproductive organs on the material (Figure 1). During the body mapping session, biological terms for the sex organs were added on a whiteboard. As the session progressed, the researcher discussed the vocabulary with the participants, using a cross-section illustration of the reproductive organs and pelvic floor. It concluded with an introduction to the pelvic organs. The activity lasted approximately 20 minutes.

**DIY (Do-It-Yourself) Wearable eTextile**

Having learned about the pelvic organs – that encompass the sex organs, bladder, and rectum – we distributed the second half of the design kit. The second half of the design kit consists of materials to explore the anatomy of the pelvic floor: a fabric print of the different muscles that constitute the pelvic floor; a pair of knickers; a handout that shows how to assemble the fabric print; a handout that details what is the pelvic floor and how to find it. As shown in figure 2, the fabric print includes the pelvic floor muscles, laid out flat and ready to cut-out. Once cut-out, the print is ready to be assembled, and it renders visible the shape of the female pelvic floor. Once constructed, the pelvic floor comprises a functioning eTextile: it is attached to the knickers via a soft circuit, and to a wearable electronics component (see Figure 3). When connected, it supports timing and visualizing a basic pelvic muscle exercise via a sequential timer.

**Conclusion and Future Work**

In this work, we designed and deployed an eTextile design kit that supports body literacy with six female participants, aged 15-16. Through crafting and composing material representations of their own body landscapes, participants were prompted to reflect on and engage with the possibilities and necessity of
intimate care. The assembly of the pelvic floor print into a wearable item created some hesitation among the participants. Translating a flat pattern into a body-worn technology needs to account for the body mass and volume, which participants did not expect. We used a female torso to demonstrate the working wearable electronics, and some of the participants also tried on their own wearable eTextile. eTextiles afforded participants the ability to shape the educational ‘content’ to their own bodies. The design kit afforded opportunities to make visible the invisible, and through its materiality drew attention to the disembodied (i.e. illustrations and 3D models), and later embodied (i.e. wearable eTextiles), representations of the hidden parts of the body, in this case the pelvic floor muscles.

Such embodied representation offers new possibilities for HCI to consider both education and intervention in personal and intimate care. One avenue for future research could explore the possibilities for embodied representations in health and wellbeing interventions, e.g. to visualise the process and benefits of doing pelvic floor exercise in ways which conform to the individuals, varied groups of women (e.g. ante-natal), and, with adaptation, to other populations (e.g. older adults) for personal, intimate and sexual health education.

References


