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**POSTER ABSTRACT****Designing a Personal Wearable Device Technology for Mitigation of Limb Coldness: Participatory Workshops to Explore Design Issues**

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Limb coldness is a syndrome associated with a range of medical conditions in which poor blood circulation or body temperature control is a problem. People with limb coldness experience pain, discomfort, and negative impacts on their quality of life. In this paper we explore the potential of technology to support people with limb coldness, considering the case of people with Post-Polio syndrome in particular. Following a review of the literature on limb coldness, we present the results of two user-centered design workshops with eighteen polio survivors. The workshops explored the impact of limb coldness on quality of life; the strategies used by participants to manage limb coldness, and investigated issues surrounding the design of personal wearable technologies to support people with cold limbs.

The workshops consisted of two phases; the first phase was an open discussion between participants concerning the impact on their quality of life of limb coldness, their coping strategies and the pros and cons of these strategies. In the second phase participants were invited to explore the issues surrounding the design of technology, and introduced a variety of props (clothing materials, straps, socks, gloves, different sizes and forms of device enclosure) to facilitate discussion. Additionally, a number of controllable heating pads (Soma heat)[1] designed to support prototyping of heat-based interactions were provided, along with examples of temperature sensors. Data was collected directly by audio, video recording and notes from participants and moderators. The data from the workshops were transcribed with the aid of software and checked against the audio files. Notes were recorded separately and stored in Atlas Cloud for later analysis. Thematic analysis was then carried out on the data collected.

The workshop outcomes shed light on the impact of cold limb syndrome on participants' quality of life, including pain, inability to do things, and lifestyle consequences. Participants used a range of technological and behavioural strategies such as electric blanket; avoiding sources of cold (e.g. air drafts) or performing exercise (e.g. swimming, keep standing, stimulate muscles) to cope with limb coldness. All of the strategies have advantages and disadvantages, and none are without disadvantages, users adopt strategies according to their changing needs and are not always successful. While participants were positive about the possibilities for technological supports, a range of requirements regarding designs was identified. Participants' design requirements were mainly related to look and feel (e.g. material, position on the body, compatibility with clothing), design and control (e.g. Features related to long life batteries, remotely controllable) and physical properties (e.g. light material) of the wearable device. We discuss potential implications for the

design of technology in this space, as well as an agenda for future studies in the field of wearables and sensors related to cold limb syndrome.