Patient Involvement in the Design of Technologically-enhanced Clothing to Help Manage Musculoskeletal Conditions

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BACKGROUND

- Patients with musculoskeletal (MSK) conditions often have difficulty with dressing due to pain and restricted joint mobility.
- Mainstream garments provide limited choice for patients who subsequently devise alternate methods of dress.
- Emerging technologies such as the “Internet of Things”, wearables and biotechnology create the future potential for clothing to be used as a vehicle in the management of MSK conditions e.g. topical medication delivery and/or biofeedback data collection for their healthcare provider.

OBJECTIVES

- To design wearable everyday garments which cater to the needs of patients with MSK conditions.
- To assess the acceptability of incorporating potential technological enhancements.

METHODS

- 4 adult participants who met the inclusion criteria (diagnosis of a MSK condition and ability to communicate in English) were recruited from the Rheumatology Independent Patient Group at King’s College Hospital NHS Foundation Trust.
- 2 males and 2 females (aged 37-68 years, 3 Rheumatoid Arthritis; 1 Ankylosing Spondylitis, disease duration 6-50 years and of diverse ethnic background) took part in 4 co-design workshops conducted by a student fashion designer (AC).
- Garment prototypes were presented to patients and continually modified between workshops based on group feedback.
- Workshops were audio-taped and transcribed to aid design assessment.

RESULTS

- Patients wanted a mode of dress to enable independence and provide comfort; whilst maintaining dignity and a sense of self-expression:
  “It would be great if clothing could be continually done up by oneself rather than needing someone’s help. I think that I’d feel much more comfortable” - Male 2, 47
  “Just a bit of shape and consideration to the average lifestyle would make a difference, because you feel fumpy enough with these conditions.” - Female 1, 57
- It was important that the garments were easy to wear, versatile, made of a lightweight breathable fabric and looked regular clothing:
  “With all the conditions faced by us, you’d need proper fabric that breathes and can cope with layering. Also, you don’t suddenly turn into an awful, unflattering person at 50 or when you have a disability issue. We deserve clothing that is just like anybody else’s, rather than something that tells you we are facing an issue.” - Female 2, 68
- 5 garments resulted with 3 basic accommodate dress methods: entry from the bottom-up, side and a flip-over mechanism.
- Patients were receptive to the potential future use of the clothing to deliver topical pain relief medication and would be happy for biofeedback data to be shared with their healthcare team, provided this data could be transmitted securely:
  “If it’s localized [information storage] or the patient has a certain level of control, I feel biofeedback can work really well.” - Male 1, 68
  “I wish there was a thing that got activated when I’m wearing my clothes that could medicate me before pain occurs. I think a slow release medication and a tracking system will actually help as a coping mechanism.” - Female 1, 57

CONCLUSIONS

- Garments can be instrumental in an individual’s continued perception of normality, social identity, control and confidence over their life.
- Clothing is a big part of everyday life; its enhancement can play a welcome, unobtrusive role in the management of patients with MSK conditions.
- Technologically-enhanced clothing proposes a more personalised and empowering approach to complement disease management.

REFERENCE


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