Development of a Responsive Emotive Sensing System (DRESS) “Smart Dresser” to Enable Dressing by Persons with Alzheimer’s Disease

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DRESS research supported by:

2011-13  USA ETAC grant award #11-200316

2014-2016  Grant Award # R21 NR 013471 from the:

U.S. National Institutes of Health, Nursing Institute

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MGH-Institute of Health Professions, Boston, MA

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Significance

- 61% of caregivers help with dressing, the most common activity of daily living (ADL) and the
  - Most pressing daily concern in early to mid-stage AD
- Established dressing guidelines suggest simplified routines and prompting
- Repetitive prompting:
  - Annoying, fatiguing, provoking
- Could automated prompting help?
Aims and Method

1. To explore the issues that arise when a person with Alzheimer’s disease cannot dress themselves independently

2. To obtain caregivers’ critique of our proposed automated prompting system and improvement recommendations

– Conducted 3 Caregiver Focus groups in Boston with 25 participants experienced in helping with dressing and analyzed using qualitative grounded theory methods
1. Preserving Dignity - Normalizing

- “Mother would say – You know I am not an invalid. I can get dressed myself, I don’t need any help”

- “Yet she did. So I would say, let me help you with the buttons/zipper etc, because I have trouble doing that by myself”

  » Daughter
Family Caregivers’ perspectives on dementia related dressing difficulties at home: The Preservation of Self model

Preservation of the self: Caregiver
Conclusions on Dressing

• Dementia related dressing difficulties need to receive more attention
• Family members desire dressing aids and clothing that are both easy to use and maintain dignity
2. Proposed DRESS Components

- Emotion sensing
- Camera view
- Wrist/ankle skin galvanic sensor band

**DRESS SYSTEM**

- Wireless System
- IR Privacy Camera
- Audio I/O
- Drawer Sensors
- Motivational Displays
- System Server

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Response to Technology

- Participants verified DRESS would be best for late early to early mid-stage Alzheimer’s Disease
- Technology design fit well for room, not “intrusive”
- 90% of DRESS prototype features were affirmed

Recommendations:
- Change to dresser top “TV screen” - IPad
- Send alert if wandering out of the room occurs
- Include an option to use their voice for system prompts
- Add a chair next to, and a mirror on the side of, the dresser
DRESS Alpha Version 1

- iPad
- iPods
- Motion sensors
- Caregiver’s device
- Wrist sensor
- Fiducials

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Seat Sensor Pad Prototype
Caregiver brings PWAD to dresser

Caregiver selects Dressing or Undressing sequence

PWAD engages, Caregiver leaves

When the PWAD nears the dresser, the system gives instructions to dress

System alerts caregiver

Caregiver screen

Wander

Leaves room

System asks the PWAD to come back to the dresser to get dressed

When the PWAD nears the dresser, the system gives instructions to dress

System alerts caregiver
Take out your Shirt
It looks something like this

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Fiducials Prototype
Caregiver Status Notification

Dressing Sequence progressing

Win is not in the room
Please check

Dressing Sequence Completed!!

OK
Hispanic/Latino Study in Arizona: Ethnic/Regional Differences (n=20)

Importance of “Western Wear” to males:
Western boots, hats, pants, belts/buckles, scarf / rope ties

*My husband sees them in the closet and wants to wear them like before and he can’t dress like that... I have difficulty putting them on and he can’t button or pull up his pants... he blames me... that I have him dressed in women’s clothing (elastic waist pants, a pull on top and sneakers)*
Conclusions

• The Model was applicable to these Hispanic/Latino participants

• Although the similarities in dementia related dressing challenges outweighed the differences, the differences do support the need for cultural sensitivity to ethnic preferences for types of caregiving assistance and regional dressing styles
Other Ethnic / Regional Clothing Preferences?