Home use medical devices and older people.

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In the UK between 1985 and 2010 the number of people over 65 increased by 17% to 1.7 million.

It is predicted that by 2034, 23% of the population will be aged 65 or over 3.5 million of which will be aged 85 or over.

A similar trend in increased life expectancy is being seen in Western Europe, Japan and the United States of America.
• One result of an ageing society and its increased life expectancy is the rise in chronic diseases

• This has led to the focus and delivery of health care migrating from the hospital setting into people’s homes (Lathan, Bogner, Hamilton and Blanarovich, 1999)

• This relocation of health care has resulted in the increased use of medical devices in the home (WHO, 2008)
Background

- The home environment is particularly important to the elderly with growing old being associated with an increased and intensified attachment and emotional involvement in familiar places (O’Bryant, 1982)

- It has been suggested that clinical interventions might have a transformative effect on the inherent characteristics of the home and create ambiguities between ‘home’ and ‘institution’ which may erase or reverse any positive notions that older people might have for the home (Martin et al, 2005)
Users of medical devices in health care settings are likely to be experienced, trained, healthy professionals.

Users of home medical devices, in contrast, are likely to be a heterogeneous group of non-professionals or patients using the device on themselves.

Hospitals and clinics are standardised and regulated environments.

Homes, in direct contrast, are unpredictable, uncontrolled and changeable.

(Bitterman, 2011)
• Previous studies have investigated the integration/user-friendliness of particular types of medical devices in the home:

  Home ventilators and long-term oxygen therapy  
  (Ingadottir and Jonsdottir, 2006)

  Antibiotic intravenous therapy, parenteral nutrition, oxygen therapy and peritoneal dialysis  
  (Lehoux, 2004)

  long-term oxygen therapy and peritoneal/haemodialysis  
  (Fex et al, 2009)

• None have looked at this from an ‘older peoples’ perspective
A sample of 12 participants and 5 of their partners was recruited from the East Midlands.

Inclusion criteria were that participants had to be 65 years or older and that they had to currently use medical devices in the home.

Medical device defined as covering “all products, except medicines, used in health care for the diagnosis, prevention, monitoring or treatment of illness or disability” (MHRA, 2011).
<table>
<thead>
<tr>
<th>Device Type</th>
<th>Number of Participants *</th>
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<tbody>
<tr>
<td>Blood pressure monitor</td>
<td>5</td>
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<tr>
<td>Nebulizer</td>
<td>3</td>
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<tr>
<td>TENS machine (^a)</td>
<td>2</td>
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<tr>
<td>Blood glucose monitor</td>
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<tr>
<td>Stair lift</td>
<td>2</td>
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<tr>
<td>Telehealth/care monitors</td>
<td>2</td>
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<tr>
<td>Assistive/mobility devices</td>
<td>2</td>
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<tr>
<td>Leg circulation booster</td>
<td>1</td>
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<tr>
<td>Oxygen concentrator</td>
<td>1</td>
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<tr>
<td>Oxygen tank and conserver</td>
<td>1</td>
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<tr>
<td>CAPD (^b)</td>
<td>1</td>
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<tr>
<td>APD (^c)</td>
<td>1</td>
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<tr>
<td>Saturated oxygen monitor</td>
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</table>

* Some participants were users of more than one device

\(^a\) Transcutaneous Electrical Nerve Stimulation

\(^b\) Continuous Ambulatory Peritoneal Dialysis

\(^c\) Automatic Peritoneal Dialysis
Method - Procedure and Data Collection

- Semi-structured interviews were guided by an interview schedule consisting of 11 open-ended questions.
- Interviews lasted approximately 60 minutes.
- The interviews were recorded digitally which were subsequently transcribed verbatim.
- Interviews were conducted either at the participant’s home or at a public place according to the wishes of the participants.
• Braun and Clarke’s (2006) systematic approach to thematic analysis was used to identify, analyse and report the themes within the interview data.

• A data-driven, inductive approach to coding the data which allows for a rich overall description which is strongly linked to the data itself.
<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
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<td>User sacrifice</td>
<td>Financial costs</td>
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<td></td>
<td>Time costs</td>
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<td></td>
<td>Limited choice</td>
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<td>The accommodating home</td>
<td>Physical presence</td>
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<td>Altering the home</td>
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<td>The device within the home</td>
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<td>The influence on others</td>
<td>The impact on others</td>
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<td>The social device</td>
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<td>Self-esteem</td>
<td>Social comparison</td>
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<td>Personal control</td>
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<td>Mastery</td>
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<td>powerlessness</td>
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<td>Emotional consequences</td>
<td>Feelings of detachment</td>
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<td>Positive affect</td>
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<td>Negative affect</td>
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Results- User Sacrifice

- **Financial costs**: “your acupuncture’s stopping, we can’t see you anymore and we’d like you to try the TENS machine…Take it home and try it and if it works for you then its £39, you know?”
- **Limited choice**
- **Time costs**: “and just the sheer effort of putting the whole lot together, it took quite a while out of the day . . . it seemed to take one great chunk out of the day you didn't want it to.”
Discussion

Choice

Being given a choice has been associated with:

• alertness and well-being (Langer and Rodin, 1976)

• positive effects on patient outcomes (Ogden, Daniells and Barnett, 2009).

• enhanced object attractiveness (Huang, Lei, and Junqi, 2009)
Results - The Accommodating Home

- **Physical presence**: “[The oxygen concentrator]... It’s extremely heavy... [and] it’s in the middle bedroom because it’s so noisy”

- **Device within the home**

- **Altering the home**: “Yes, this hall... was rows of shelves from floor to ceiling with bags or boxes of dialysing fluid”

  “The front bedroom of course has totally changed now... It’s basically my respiratory room really.”
**Altering the home**

- Home was variously described as a castle, a place to feel safe and secure and a place of comfort.

- Altering the home was a difficult transition and met with a degree of resistance for some who had lived in the same house for many years.
Results - The Influence on Others

- **The impact on others:** “I don’t know why he gets uppity about it [taking my blood pressure] but it seems to make him feel a bit annoyed that I keep doing it.”

  “I would have slept in a separate bedroom on occasion to get an undisturbed night. . . . And we had to change sides because of the way the bedroom is laid out…That was strange!”

- **The social device:** “My grandchildren love it because they have a go on it when they come out and do their blood pressure. They have a little book that I keep their blood pressure in when it’s done.”
Discussion

• Negativity may be due to the partner having to share the same environment as the device without directly benefiting from it

• Little literature on the effect of medical devices on the relationship between grandparent and grandchild.

• Example of normalization strategies used to decrease disruption and maintain family processes? (Deatrick, Knafl, & Murphy-Moore, 1999)
• **Feelings of detachment:** “Yes, I mean it’s just an instrument as far as I’m concerned. I don’t have any attachment to it.”

• **Negative affect:** “I don’t want to be ill; I don’t want to have problems. So having to do that [monitor blood pressure] just reminds me that I’ve got them. And that annoys me”

• **Positive affect:** “[The blood pressure monitor] has made me live each day as it comes, and make the most of it.”

“It gives me a sense of security that I’ve got it beside me to use”
In general, participants expressed positive feelings about their devices.

Often not able to think of ways to improve the device.

Older people are more likely to express greater levels of satisfaction with regards to health care than younger people (Calnan, 2003)
Results- Self Esteem

- **Powerlessness**: “There is no alternative so you take what comes at you. . . . it doesn’t make you very happy but that's your fate”

- **Personal control**: “Well, I use my [glucose] monitor seven or eight times a day probably. . . . That’s so I can just, I always know what state my blood sugar’s in”

- **Mastery**: “You’ve got to know how to use the equipment. Luckily I’ve been shown properly and I’ve always used it in the correct manner and it’s always worked.”

- **Social comparison**: “and it’s amazing the number of people I’ve met who know absolutely nothing about [diabetes] and they’re sitting there and we got talking about it and they know virtually nothing about what’s what, the situation they’re in”
Discussion

- Using medical devices had both positive and negative consequences on self-esteem
- Part of the adjustment process to a threatening event (e.g. chronic illness) is control or ‘mastery’ over the event (Eccles, Murray, and Simpson, 2011)
- Medical devices facilitated downward self-enhancing comparisons (Kernis et al, 2005).
The psychosocial issues raised in this study highlight the impact home use medical devices have and the challenges faced by older people and their partners as they adopt and adapt both their lives and environment in order to accommodate these devices.
• The use of opportunity sampling might have limited the diversity of participants and devices.

• Gratitude bias.

• Interviewing the user and partner together might have resulted in a less open and frank discussion.

• A difficulty in focusing the talk on the device itself as opposed to the medical condition which demonstrates the inextricable links between the condition and device, and vice versa.
Conclusion

- This study has described some of challenges faced by this particular group of older people in relation to medical device use.
- The idea that for many of the devices in this study that they are regarded as ‘home use’ and have been designed to slot into people’s lives is not generally supported by these older people.
- Only addressing the clinical and safety requirements of users in relation to the design of these medical devices does not guarantee user satisfaction.
- An improved understanding of these issues by designers and health care professionals could help to better facilitate and support the integration of medical devices into the homes of older people.
Future studies

• Longitudinal qualitative study (Interpretative Phenomenological Analysis) to describe the experience of older people: before, during and after home medical device acquisition (oxygen concentrator).

• Questionnaire study to investigate the relative importance of different device characteristics (e.g. aesthetics, cost, clinical trials…) as reported by different stakeholders (e.g. procurement, doctors, nurses, users…).
References


References


Thank You