How can human factors be used in the design of dementia care environments?

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How can Human Factors & Ergonomics be used in the Design of Dementia-Care Environments?

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Introduction

- **Design of dementia care environments** is an important topic due to an increasing population of people with dementia (PWDem).
- In 2010, there were 35.6 million people living with dementia1. This is expected to double every 20 years2 and by 2050 there may be 115.4 million people across the globe suffering from dementia1.
- **Human Factors & Ergonomics (HFE)** explores a problem by looking at the people within a system, their interactions with each other and the system, and then re-designing the tasks, interfaces and system with the stakeholders, including PWDem and their carers (including family and friends).
- HFE design is likely to be a particularly useful approach due to its emphasis on inclusive design, rather than requiring people to learn new skills or adapt their behaviour.
- There is a growing body of literature on design in dementia care environments (Fig. 1), however the extent to which current design features and design guidelines map on to HFE principles is unclear. This will be explored as the unique contribution to knowledge.

Method

- Systematic literature review on design features of dementia care environments including a critical appraisal of methodology and mapping to HFE principles.
- Searches of databases including Google Scholar, Science Direct, Web of Science and PubMed using a wide range of search terms relating to dementia and design.
- Critical appraisal of included articles using the Pluye ‘Mixed Methods Appraisal Tool’ (MMAT)3.
- Confirmation of proposed research areas by focussing on the intended outcome of design features.
- Included articles grouped by main topic of focus – BPSD (biological and psychological symptoms of dementia), food and fluid intake, sociability, activities and communication, quality of life and wayfinding.

Results

- 79 papers included after exclusion of ineligible papers.
- Critical appraisal with MMAT4 resulted in exclusion of further 4 papers.
- Main themes that emerged in relation to design and dementia were outdoor spaces, physical characteristics of the indoor environment, privacy and sociability, safety, stakeholders and wayfinding. HFE principles were also considered in terms of how frequently they were (or were not) used in the design process.

Main findings:

- Outdoor spaces - largely thought to be beneficial to the quality of life of PWDem. Lack of consensus on effects of outdoor spaces on agitation and aggressive behaviours.
- Physical characteristics of indoor environment – non-institutional environments are preferable (Fig. 2).
- Privacy and sociability – a balance between the two is important. Several references in literature on activities to ADLs (Activities of Daily Living) and IADLs (Instrumental Activities of Daily Living), suggesting that these are an important area of focus.
- Safety – accessibility is important and safety features should be as inconspicuous as possible.
- Stakeholders – different groups have different priorities. The thoughts and opinions of carers and relatives of PWDem may not necessarily reflect the best interests of PWDem.
- Wayfinding – signage and other wayfinding cues are important. The physical layout of an environment (e.g. corridors and location of rooms) is important as it can either facilitate or inhibit wayfinding.
- HFE principles – indirectly considered in some papers, for example those which suggested that designs which account for the limitations of PWDem are likely to be of benefit to users. However, it was rarely clear whether or not HFE principles had been implemented therefore this warrants further research.

Future work

- Online survey to explore design professionals’ understanding of Activities of Daily Living (ADL). This will help to highlight areas in which knowledge could be shared more effectively and in a more meaningful way between clinicians and design professionals, facilitating the use of HFE principles in dementia design.
- Development of dementia design personas to communicate design requirements. Currently there are no validated personas to describe people with dementia.
- Evaluate and validate (member checking) the dementia design personas collaboratively with PWDem, their families and friends, designers, HFE specialists and dementia experts.
- Test the empirically derived and validated dementia design personas as a design communication tools for dementia care environments.

References


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