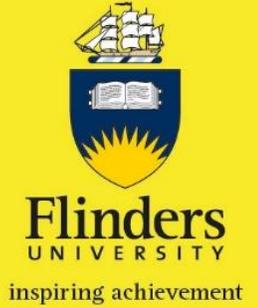


Health Smart Homes: User Perspectives



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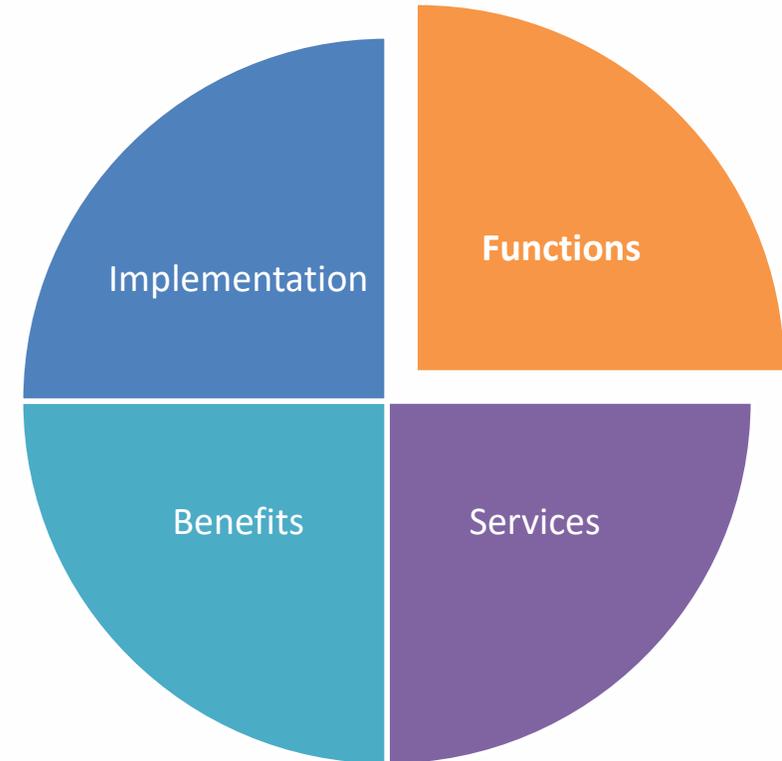
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Research Aim

- To identify the perceptions of users of Health Smart Homes to support ageing by reviewing the literature.
- Four topics identified as relevant to user perception occur widely in this literature:
 - ***Functions***
 - Services
 - Benefits
 - Implementation.



Methodology

- **Literature Search**

Sources: PubMed, Google Scholar, and Scopus.

Time-frame: 2008 – 2019.

- **Keywords & Search Criteria**

"smart home" OR "ubiquitous home" OR "automated home"
OR "ambient assisted living"

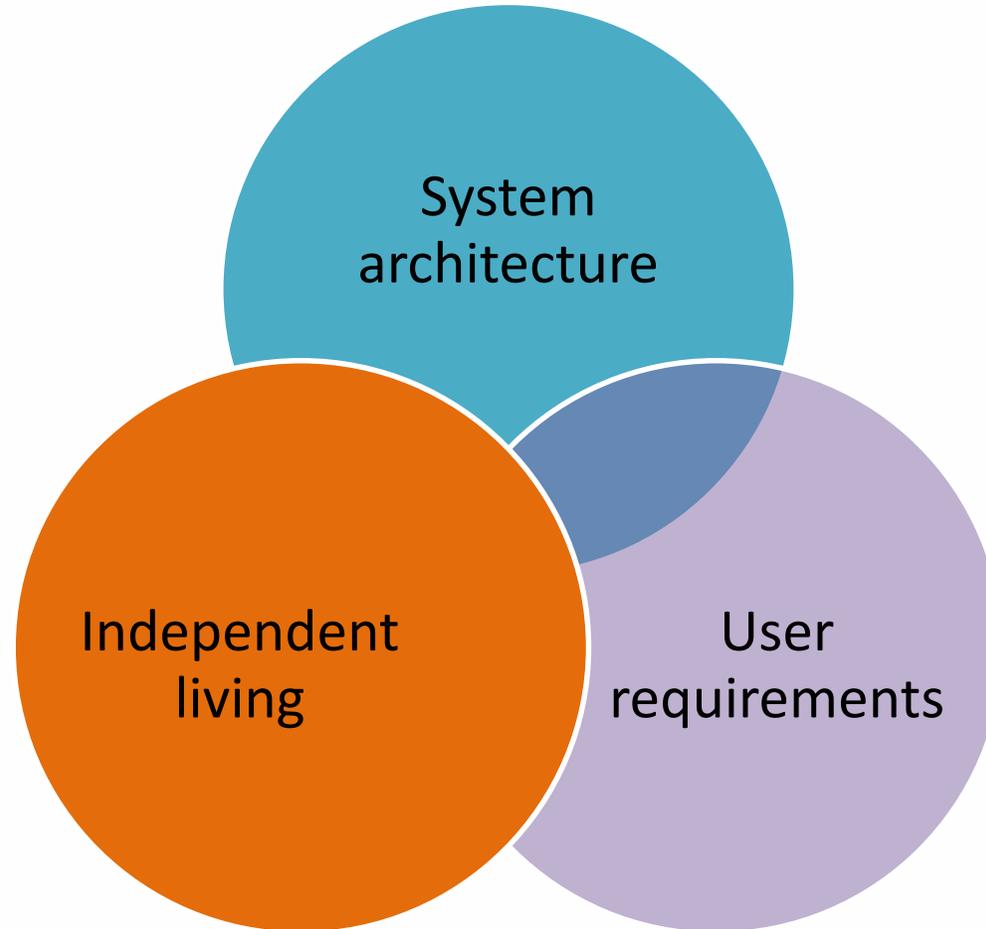
AND

"aged people" OR "gerontechnology" OR "ageing population"

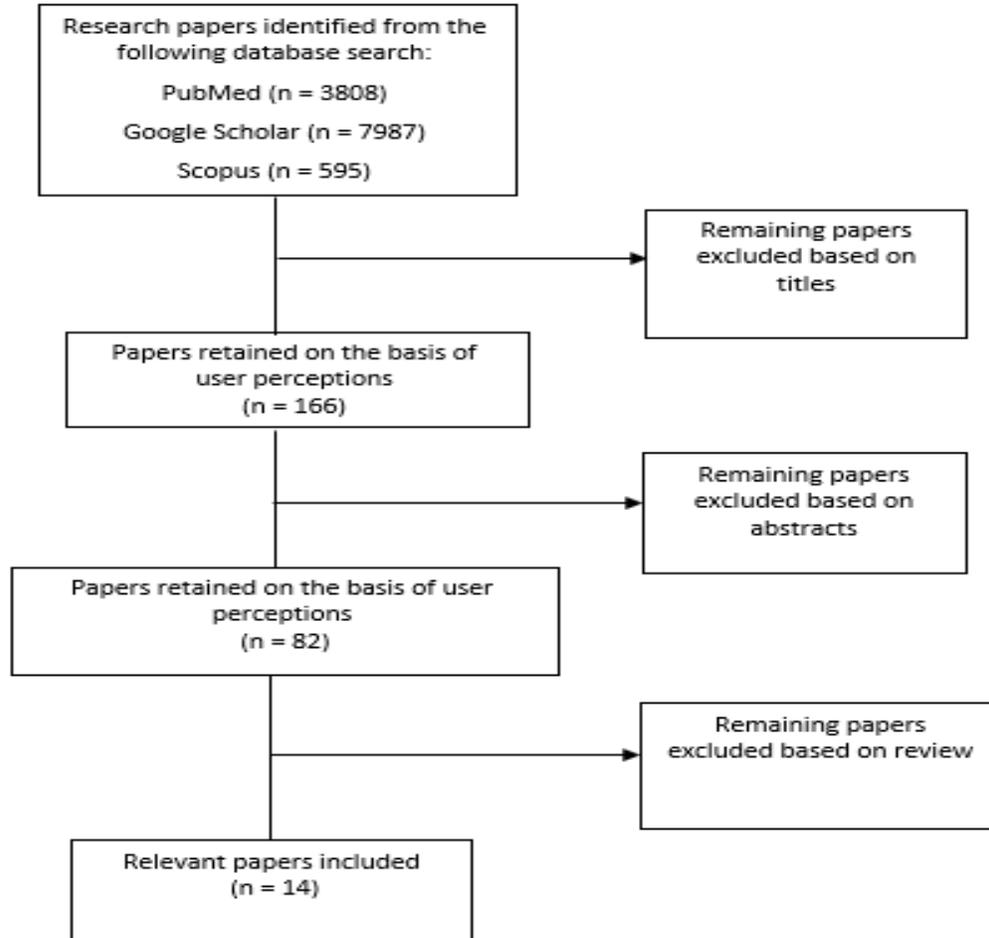
AND

"quality of life" OR "self-management" OR "self-care".

Methodology

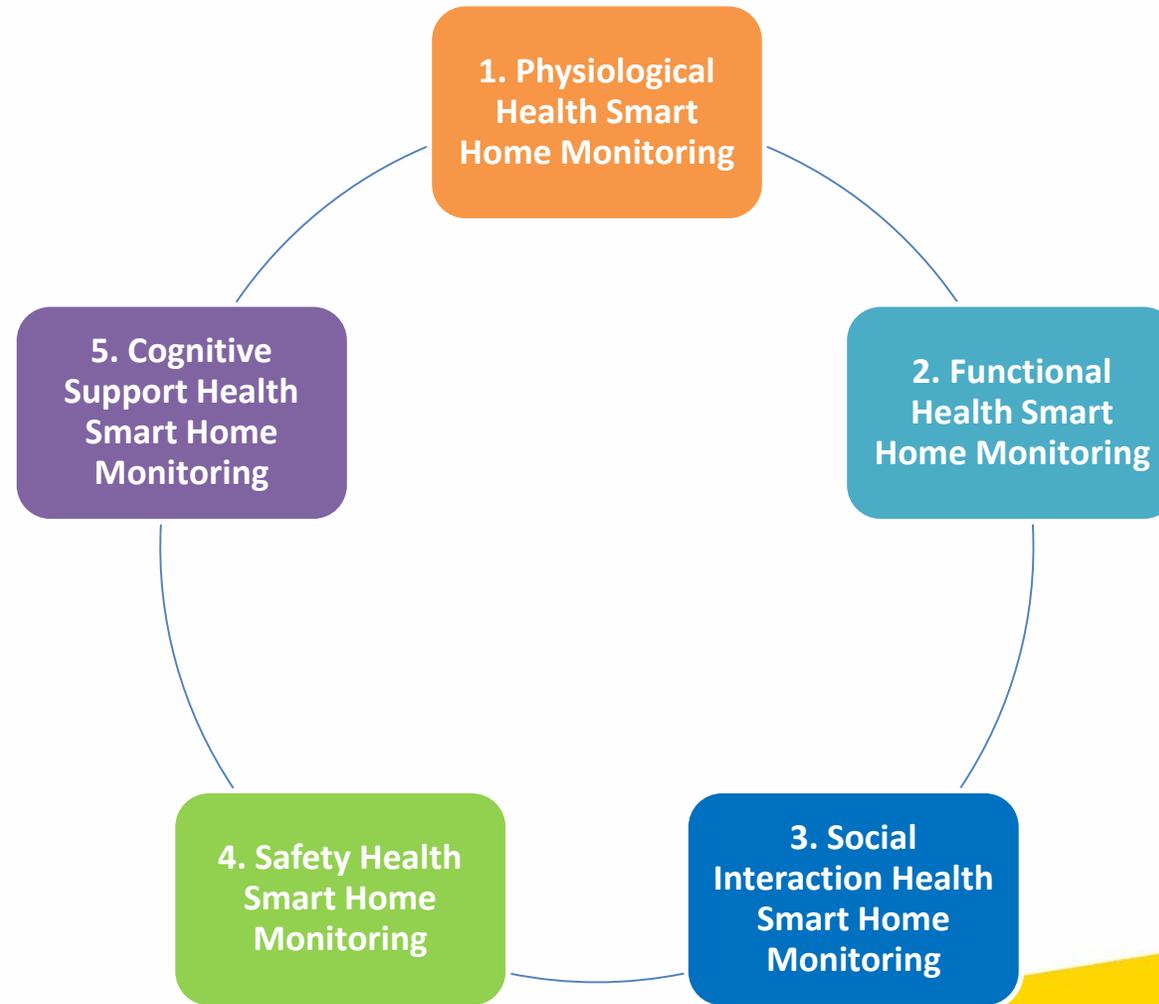


Literature Search Methodology



Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none">Published in English and available in full text from peer reviewed journals.	<ul style="list-style-type: none">Books, PhD or Master theses, lecture notes and duplicate articles.
<ul style="list-style-type: none">Included participants aged > 65 years.	<ul style="list-style-type: none">Papers focusing on telehealth and m-health.

Functions



Results

1. Physiological Health Smart Home Monitoring

- Four papers described use of physiological measures such as vital signs to monitor health status of elderly people.
- **User Perceptions:**
 - Self-management
 - Behavioural patterns
 - Quality of life.

Results

2. Functional Health Smart Home Monitoring

- Two papers described use of functional measures to determine the Activities of Daily Living (ADL's) such as routine work, nutrition, sleep patterns.
- **User Perceptions:**
 - Quality of life
 - Usability
 - Functionality.

Results

3. Social Interaction Health Smart Home Monitoring

- Two papers described elements such as cognition and speech to support human communication needs.
- **User Perceptions:**
 - Interpersonal relationships
 - Well-being
 - Usability.

Results

4. Safety Health Smart Home Monitoring

- Two papers described the use of posture recognition and mobility analysis to provide a fall detection system.
- **User Perceptions:**
 - Quality of life
 - User-friendly
 - Compatibility.

Results

5. Cognitive Support Health Smart Home Monitoring

- Four papers described the use of mobility and behavioural patterns to contribute to a supportive environment.
- **User Perceptions:**
 - Quality of life
 - Accessibility
 - Efficiency.

Study results for user perceptions in Health Smart Homes

Paper	Operational Model Functionality	User Requirement	System Architecture	Outcomes
[11]	Self-management system for physical exercise and performance evaluation	Usability, functionality, scalability	Proposed health system infrastructure	Patient engagement, self-management, care delivery
[13]	Cognitive assistance for participants social-activities and daily activities	Usability, quality of life	Inbuilt Smart Home	Interpersonal relationships, community life, physical, cognitive behaviours
[14]	Monitoring the activity, diet and exercise compliance of diabetes patients	Accessibility, quality of life	Inbuilt Smart Home	Self-management education, low cost health-assistance, behavioural monitoring
[19]	Monitor senior adults' daily behaviours and the living environment	Feasibility, quality of life	Inbuilt Smart Home	Interoperability, behavioural monitoring
[20]	Monitor the physical and cognitive function	Acceptance, perception	Inbuilt Smart Home	Self-management, behavioural monitoring
[16]	Motivational gaming system to increase the physical activity of elders with complex chronic conditions	Scalability, integrity, user-friendly	Inbuilt Smart Home	Self-management
[21]	Monitor the physical activity	Functionality	Home automation	Behavioural patterns
[24]	Monitor inhaling, exhaling and heartbeats	Adaptability	Inbuilt Smart Home	Self-management
[15]	Cognitive assistance for rehabilitation patients with traumatic brain injury (TBI)	Functionality, patient safety	Proposed TAMPA Smart Home	Medication management, behavioural patterns
[22]	To assist mobility impaired patients	Efficacy, user compatibility	Inbuilt Smart Home	Quality of life, self-efficacy and safety
[18]	Monitoring an elderly person in a fall detection system	Compatibility, ease to use	Integrated Smart Home	Quality of life
[12]	To regulate indoor air quality through control of external environment.	Low-cost solution	Proposed Smart Home	Quality of life
[17]	Multimodal sound corpus acquisition labelling used for sound and speech recognition.	Compatibility, ease to use	Sweet Home project	Wellbeing, reliance
[23]	Monitor various memory disorders, sensory problems	Accessibility, efficiency	Home automation	Quality of life

Key Findings

- Health Smart Homes can ***empower elderly people, caregivers and healthcare professionals*** for improving longevity of life.
- Health Smart Homes can ***motivate the participants to stay healthy*** at home.
- A targeted conceptual framework for such usability studies in future research would help ***to improve the acuity with which impacts on quality of life of consumers*** could be assessed.

Conclusion

- ***User involvement*** is needed in all stages of Health Smart Home system design, implementation, and testing to achieve end user satisfaction.
- There is generally an emphasis in Health Smart Homes research on the ***technical aspects*** rather than in meeting user needs.
- Lack of knowledge on user profiles, clinical effectiveness and integration within existing Health Smart Home systems will influence our future research on organizing a proposed ***“unified framework”***.



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