SAFE LIVING: A REVIEW OF ANTI-FALL DESIGNS

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PRESENTATION OUTLINE

- Background of the research
- Research framework
- Research findings
- Discussion and conclusion
Physical aspects of walking design influence the way they are used by older people

Passive Infra-Red (PIR) detectors to monitor activity and potential intruders

Information and communication technology

Built-in anti-fall technology at home

Add-on measure or related equipment

The design of systems for the management of fall monitoring networks
CHARACTERISTICS OF ANTI-FALL DESIGNS

Secure
Product protection should not be easily hackable or damage. The security itself should be securely designed to protect the privacy and safety.

Awareness
The product or device can insist or monitor people who have mobility problems (and cognitive impairment) to be safer to live at home independently.

Findable
In the case of falls, the person can be tracked and found. Tracker, alarm system and other tracker allow them to be found and to receive instant summoning help.

Endurance
A product can provide the assistance of people who have gait and balance difficulties.

Likelihood
To move around the house safely, surface, such as floor, stairs, storage, side walk and pavement need to avoid jumble, tripping and slippery hazards and increase the accessibility.

In-height
The product can ensure high-gloss floors, chair, cabinet, bed and bath are at the appropriate high.

Vision
It is necessary to maintain proper vision of older people by assist with their eyesight or improve the lighting

Illness
Factors can be associated with increased illness incidence of falls, e.g. postural hypotension that can be reduced by monitoring.

Neutral
Anti-fall design features should not adversely affect the user’s daily living normality. The feature should not make a product more difficult to manage, or have other adverse consequences.

Go
Being able to move about (e.g. lifting, moving, handling and transferring), people need adequate environment. Otherwise aid can support people to move about independently.
AWARENESS SOLUTION

a) Central monitor system (existing)
b) Door monitor system (existing)
c) Wondering products (existing)
d) Monitors/sensor pads alarm (existing)
e) Watch style transmitter (existing)
f) Home monitoring system for family caregivers (existing/proposed)
   a) Workplace-based online for working family caregivers
   b) Home assurance monitoring system

g) Gait monitoring system (proposed)
   a) Balance assessment
   b) Foot-signature telemetry
a) Personal Emergency Response System (PERS) (existing)
   a) Medical emergency personal buttons & pendants
   b) Mobile PERS technology
b) Fall alarms (existing)
c) Fall detecting (proposed)
ENDURANCE SOLUTION

a) Walker (existing)

b) Wheelchair (existing/proposed)
   a) Medical wheelchair
   b) Invacare Compass SPT Limited Wheelchair
   c) Climbing chair
   d) Niche wheelchairs
   e) Superfourin wheelchair
   f) Navigating wheelchair
   g) Mind-controlled wheelchairs

c) Exercise bands (existing)

d) Robot de Enjoy Mobility (RODEM) (existing though not widely used)

e) Hybrid Assistive Limb (HAL) (existing though not widely used)
LIKELIHOOD SOLUTION

a) Floor Cushions and bedroom mats (existing)

b) Bath mats (existing)

c) The impact absorbent flooring (existing though not widely used)
IN-HIGHT SOLUTION

a) Adjustable furniture and units

b) Smart home environment
VISION SOLUTION

a) Eye check-up and optimal glasses (existing)

b) Lightening (existing)
a) Imperceptible vibrations enhance control (proposed)

b) Wireless body-monitoring system (proposed)
GO SOLUTION

a) Couch cane (existing)
b) Bed rails (existing)
c) Grab bars (existing)
d) Hip protector (existing)
e) RIBA robot nurse bear (existing but not widely used)
f) Robotic bed (existing but not widely used)
## Digital Design Solutions

### Awareness solutions
- **a)** Central monitor system (existing)
- **b)** Door monitor system (existing)
- **c)** Wondering products (existing)
- **d)** Monitors/sensor pads alarm (existing)
- **e)** Watch style transmitter (existing)
- **f)** Home monitoring system for working family caregivers (existing/proposed) x2
- **g)** Gait monitoring system (proposed) x2

### Findable solutions
- **a)** Personal Emergency Response System (PERS)
- **b)** Fall alarms (existing)
- **c)** Fall detecting (proposed)

### Endurance solutions
- **a)** Wheelchair (existing/proposed) x6
- **b)** Exercise bands (existing)
- **c)** Robot de Enjoy Mobility (RODEM) (existing though not widely used)
- **d)** Hybrid Assistive Limb (HAL) (existing though not widely used)

### Likelihood solutions
- **a)** Floor Cushions and bedroom mats (existing)
- **b)** Bath Mats (existing)
- **c)** The impact absorbent flooring (existing though not widely used)

### In-height solutions
- **a)** Adjustable furniture and kitchen units
- **b)** Smart houses

### Vision solutions
- **a)** Eye check-up and optimal glasses (existing)
- **b)** Lightening (existing)

### Illness solutions
- **a)** Imperceptible vibrations enhance balance control (proposed)
- **b)** Wireless body-monitoring systems (proposed)

### Go solutions
- **a)** Couch Cane (existing)
- **b)** Bed rails (existing)
- **c)** Grab bars (existing)
- **d)** Hip protector (existing)
- **e)** RIBA Robot Nurse Bear (existing but not widely used)
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