The role of telecare in supporting the needs of elderly people

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Summary
A literature review was conducted to identify the "trigger factors" associated with a need for increased levels of care and support for elderly people. An expert panel then prioritised the trigger factors into one of five bands of importance. The literature review produced 2037 hits. Of these 1768 were excluded after reading the abstract and 111 after reading the full paper, leaving 158 papers for inclusion in the review. From these papers, 102 unique factors that triggered a need for greater care and support amongst elderly people were identified. The expert panel ranked 36 of the trigger factors into the top three bands of importance. Subsequent analysis suggested that telecare could be used to assist, prevent or minimise the impact of some 66% of these 36 trigger factors and 75% of the top 12 factors. This suggests that telecare has a significant role to play in the support of elderly people and should be a major consideration when re-designing services.

Introduction

The UK government has a target that telecare should be available to all homes that need it by December 2010.[1] There is increasingly persuasive evidence for telecare interventions in certain conditions[2], such as heart failure.[3] However, there is a lack of evidence about the quality of care provided by telecare compared to traditional services.[4] This raises two questions:

1. What are the reasons, or "trigger factors", that result in increased levels of care and support for individual elderly people? For example, what are the key factors that cause people to commence home care, increase their care hours or move to some form of institutional care?
2. What is the role of telecare in preventing or minimising these trigger factors and how does telecare compare with other service delivery options?

The present study was conducted to answer these questions.

Methods

Identification of trigger factors

A literature review was conducted to identify the factors associated with a need for increased levels of care and support for elderly people. For example, falls are a reason for 40% of nursing home admissions.[5] Stoddart *et al.*[6] have investigated the determinants of home care service use by elderly people living in the community. Factors identified under the phrase ‘modifiable health conditions’ were (a) worse foot health, (b) falls, (c) eyesight and (d) incontinence. Papers were excluded if they had no relevance or used broad descriptive terms such as ‘health’ or ‘physical’ rather than describing specific problems.

The review covered all segments of care, including formal or statutory, and informal care from family and friends. The following information sources were searched: Pubmed, Embase, Medline, CINAHL and the Journal of Telemedicine and Telecare. Literature already known to the authors was examined, references of references were pursued (‘snowball’ tracking) and the 'grey' literature was searched via Internet search engines.

To verify the results of the literature review an expert panel was convened to discuss what they believed were the main reasons for elderly people needing increasing levels of care and support. The nine-member panel included participants from agencies such as housing, health, social care and voluntary services as well as user and carer groups.

Prioritising the trigger factors

As part of the literature review, attention was given to identifying literature which prioritises one trigger factor against another. This was supplemented by the expert panel, where all trigger factors from the literature review, as well as those suggested by the expert panel, were randomised and presented individually for the panel to prioritise into one of five bands of importance. Band 1 was the highest priority and Band 5 the lowest. When deciding which band a trigger factor should be placed in, participants were asked to take account of the scale of change in care and support that results as a consequence of the trigger factor, as well as their perception of the number of elderly people affected.

A postal questionnaire was designed in order to obtain a prioritised list for the most important trigger factors (Bands 1 to 3 from above). Recipients of the questionnaire were asked to indicate their level of agreement as to whether each specific trigger factor was a ***major*** reason why elderly people commence, or need increasing levels of, care and support. The level of agreement was specified on a five-point scale from 'strongly agree' to 'strongly disagree'.

The questionnaire was sent to three areas of the UK from which 110 randomly selected respondents were identified from each of the following groups: residential care home managers, district nurses, home carers and community alarm users. This gave a potential sample of 1320 subjects. Ethical approval was obtained from the appropriate committees.

Service delivery mapping

The role of telecare in mitigating the trigger factors in the top three bands of importance was compared with conventional service delivery methods and assistive technology. Formal care services were defined as regular intervention by health, care and support services. Assistive technology was defined as the main support being provided through specific pieces of equipment to enhance the functional ability of the user, e.g. a hand rail, Zimmer frame or communication aid. Assistive technology and telecare do not necessarily function in isolation from formal care services but the main support was through that method.

For each trigger factor the following methodology was employed to identify service delivery examples.

1. a literature review covering formal care delivery, assistive technologies and telecare
2. discussions with health care professionals who prescribed assistive technology and were involved in service delivery
3. the personal knowledge and experience of the authors.

This produced a list of service delivery interventions to address each trigger factor. In carrying out this exercise, no judgements were made about the quality of the interventions, just that services existed. For example, consider a fear of falling, the first trigger factor in Table 1. An example of conventional service delivery to address this trigger factor is a referral to a falls clinic. An example of an assistive technology is an aid such as a hand rail being installed. In the case of telecare, a service delivery intervention to reduce a wearer's fear of falling might include automatic fall detectors linked to a community alarm system. Therefore in this case, all three service delivery methods were identified as addressing this trigger factor, with deployment dependent on individual user circumstances.

Results

Identification of trigger factors

The literature review produced 2037 hits. Of these 1768 were excluded after reading the abstract and 111 after reading the full paper, leaving 158 papers for inclusion in the review. From these papers, 102 unique factors that triggered a need for greater care and support amongst elderly people were identified.

Participants at the expert panel meeting identified a total of 107 trigger factors. These included all 102 trigger factors identified in the literature review. The five additional items were to some degree implicit in other trigger factors identified.

Prioritising the trigger factors

Despite numerous trigger factors being evident in the literature, no papers were identified that compared the relative importance of one factor against another. The expert panel ranked 36 of the trigger factors into the top three bands of importance and these were pragmatically chosen for further prioritisation.

Because of incomplete addresses, 1309 postal questionnaires were posted out of the potential 1320. Of these, 317 were returned giving a response rate of 24%, see Table 2.

Analysis ranked the 36 trigger factors while a linear regression model with location and respondent category (e.g. district nurse, home carer) was used to determine differences between groups. The top 12 trigger factors are reported in Table 3.

Service delivery mapping

Figure 1 represents Table 1 pictorially using the reference numbers in that Table. The results suggest that 29 of the 36 main trigger factors (81%) fall within the domain of formal care services. Assistive technology could be utilised in 58% of cases and telecare in 66%. It can also be seen that telecare has a role in 9 out of 12 of the trigger factors (75%) identified as the 12 most significant.

Discussion

In the present review there could have been a bias towards health publications in the literature search as a consequence of the databases available. However, a high degree of

commonality was evident between the factors identified by the literature review and by the expert panel, which gives confidence in the completeness of the literature review and the level of expertise of the expert panel.

A large element of care is provided by informal carers yet few publications were identified which highlight trigger factors from an informal carer's perspective. There may be inadequate historical data and publications to understand what needs these carers address. It must also be acknowledged that the approaches to meeting an individual's care and support needs change over time and therefore the priority of factors will also change. For example, until comparatively recently carers visited to bathe people, or people were taken to day centres to be bathed, whereas nowadays, many people have showers. Therefore, such a factor may have been overstated in the literature. Equally, other more recently recognised trigger factors may not yet have appeared in the literature.

The expert panel only consisted of management staff who, as they were more removed from hands on support, might have had different views from the staff they managed. The similarity between the findings of the panel and literature review give confidence that this is not a serious problem. The relative high scores for agreement in the postal questionnaire responses provides confirmation of this.

All three forms of service delivery have a significant role to play in supporting elderly people, see Figure 1. Current service delivery puts a greater emphasis on formal care and, despite a growing number of authoritative reports[2] promoting the use of telecare, integrated mainstream services which embrace telecare are not common.

A balanced approach would seem appropriate which is not over-reliant on one particular service delivery method, but addresses each user's needs. Telecare, like any other service option, should be considered as a tool to assist the user. It is not necessarily the answer to all situations and neither should it be used in isolation from other service delivery methods. Nevertheless, our findings suggest that telecare could provide a real opportunity to assist elderly people and mitigate key trigger factors. However, careful service integration, along with user centred assessment and review will be required.

The present study suggests that telecare has a significant role to play in supporting elderly people, alongside traditional care services and assistive technologies. However, further work will be required to understand how best to design services which are to be used widely. Work will also be required to identify at what point telecare should be provided and what equipment will be most effective for specific conditions.

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Table 1 Reasons why elderly people need more care and support, and the role of three service types

	Trigger factor	Formal care	AT	Telecare	No.	Trigger factor	Formal care	AT	Telecare
1	A fear of falling.	✓	✓	✓	**19**	Inadequate home care provision.	✓	✓	
2	A major health event - such as support following a stroke or hip replacement.	✓	✓	✓	**20**	Managing pressure sores.	✓	✓	✓
3	A perceived decline and concern for own health.	✓		✓	**21**	Medication management – such as compliance problems.	✓	✓	✓
4	A person feeling lonely.			✓	**22**	Mobility problems, getting around the house.	✓	✓	
5	Abuse (physical or mental).	✓		✓	**23**	Moving to be near relatives (on the advice of, or choosing to be nearer to relatives or friends).			
6	Bereavement, of a family member or friend.				**24**	Multiple minor longstanding illnesses.	✓		✓
7	Cognition impairment (such as dementia, confusion or memory loss).	✓	✓	✓	**25**	Needs assistance with personal care, hygiene needs, bathing, washing, dressing.	✓	✓	
8	Consequences of admission to hospital.	✓		✓	**26**	Occurrence of falls.	✓	✓	✓
9	Depression, mental breakdown or deterioration.	✓		✓	**27**	Person feels isolated.			✓
10	Deteriorating physical functioning.	✓	✓	✓	**28**	Poor nutritional/dietary intake.	✓	✓	✓
11	Difficulty cooking for themselves.	✓	✓	✓	**29**	Poorly maintained housing.	✓		
12	Difficulty in managing stairs or steps.		✓		**30**	Presence of chronic disease (such as Parkinson's, heart problems).	✓		✓
13	Difficulty toileting/continence management.	✓	✓	✓	**31**	Recent onset of visual impairment.		✓	
14	Family, friends or neighbours can no longer provide support to maintain the person at home.	✓	✓	✓	**32**	Requiring regular trips to hospital.			✓
15	Family/caregiver stress.	✓	✓	✓	**33**	Self perceived inability to manage alone or care for oneself.	✓	✓	✓
16	Housework problematic.	✓			**34**	Self-management of health conditions (regulating insulin, dealing with the pain of arthritis).	✓	✓	✓
17	Inability to care for self at home.	✓	✓	✓	**35**	Unsuitable accommodation.	✓	✓	
18	Inability to cope with Independent Activities of Daily Living*	✓			**36**	Wound care – such as dressings, care of ulcers.	✓		

*These relate to domestic tasks such as shopping, vacuuming, handling personal affairs.

Table 2 Postal questionnaire responses

	Residential/ nursing homes	**Community care staff**	**Home carers**	**Service users**	**Total**
Barnsley	35	28	30	35	128
Buckinghamshire	33	23	20	18	94
Plymouth	17	23	24	31	95
					317

Table 3 Prioritised trigger factors from the postal questionnaire

Rank	**Trigger factor**	**Average score**	**Difference (*P*<0.05)**
1	A major health event –such as support following a stroke or hip replacement.	4.8	-
2	Cognition impairment (such as dementia or memory loss).	4.8	Home carers and residential home staff rated this factor significantly higher than users.
3	Deteriorating physical functioning.	4.7	-
4	Inability to care for self at home.	4.7	-
5	Mobility problems, i.e. getting around the house.	4.6	Barnsley and Bucks rated this factor significantly higher than Plymouth.
6	Needing assistance with personal care, hygiene, bathing, washing, dressing.	4.6	Home carers rated this factor significantly higher than users/community care staff/residential home staff.
7	Occurrence of falls.	4.6	-
8	Presence of chronic disease (such as Parkinson's disease or heart problems).	4.6	Home carers rated this factor significantly higher than community care staff/residential home staff.
9	Difficulty in toileting/continence management.	4.3	Home carers rated this factor significantly higher than community care staff/residential home staff.
10	Consequences of admission to hospital.	4.3	Users rated this factor significantly lower than community care staff/residential home staff/home carers.
11	Depression, mental breakdown or deterioration.	4.3	-
12	Inability to cope with Independent Activities of Daily Living.	4.3	-

Figure legend

1 Map of services against the needs of elderly people (numbers relate to the specific trigger factor in Table 1, bold indicates a top twelve trigger factor in Table 3)