Assistive technology and telecare to maintain independent living at home for people with dementia: the ATTILA RCT

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Scientific summary

The ATTILA RCT

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Scientific summary

Background

There are approximately 850,000 people with dementia in the UK, most of whom will require accommodation in nursing or residential care homes when their illness has progressed to the point at which they can no longer live safely and independently in their own homes. The financial cost of caring for people with dementia is considerable, as are the social and psychological costs to unpaid caregivers, who are usually family. Caregiver breakdown is a common reason for the unplanned admission of older people to permanent nursing or residential care. Assistive technology and telecare offer a relatively new means of delivering care and support to people with social care needs by helping to manage the risks facing people with dementia who wish to remain living independently at home. Despite growing implementation of assistive technology and telecare, the evidence to support their use is limited, with many studies having poor methodology or contradictory results. This trial was designed to answer questions about the efficacy and cost-effectiveness of assistive technology and telecare, with particular relevance for those who commission and provide care for people with dementia.

Objectives

The Assistive Technology and Telecare to maintain Independent Living At home for people with dementia (ATTILA) trial aimed to test the following hypotheses that:

- the application of assistive technology and telecare will significantly extend the time that people with dementia can continue to live independently and safely in their own homes
- assistive technology and telecare interventions are cost-effective in the management of risk and in maintaining independence among people with dementia living in their own homes
- the provision of assistive technology and telecare interventions to people with dementia living at home will significantly reduce the number of incidents involving serious risks to safety and independent living, particularly those involving acute admissions to hospital
- assistive technology and telecare interventions will reduce burden and stress in family and other unpaid caregivers and increase quality of life for people with dementia.

Method

The ATTILA trial was a pragmatic randomised controlled trial comparing the outcomes of people with dementia who received assistive technology and telecare with the outcomes of people who received equivalent traditional community services but not assistive technology and telecare.

Participants were adults with suspected or diagnosed dementia living in the community who had been recommended assistive technology and telecare to help manage challenges at home caused by their dementia-related cognitive decline. Inclusion criteria were any dementia diagnosis or evidence of memory difficulties or possible dementia, a professionally assessed need for assistive technology and telecare from a health or social care professional, living in the community and living in a dwelling suitable for the installation of assistive technology and telecare. Exclusion criteria were already receiving an assistive technology and telecare intervention (excluding a non-linked smoke detector or carbon monoxide detector, a key safe or a pendant alarm) or having been previously provided assistive technology and telecare but not using it; being unlikely to comply with follow-up, for example owing to an unstable medical or psychiatric condition; participating in another clinical trial involving an

intervention for dementia; having an urgent need for a care package owing to immediate and severe risks to self or others; the absence of an appropriate unpaid caregiver; and living in accommodation unsuitable for the provision of assistive technology and telecare.

All aspects of the intervention (assistive technology and telecare assessment, funding, choice of devices, or ordering and installation of devices) were determined by staff from participating local authorities or telecare providers. Each participant underwent an assessment with the assistive technology and telecare provider to determine the level of need and what services were required. The intervention involved the installation of simple, battery-operated, standalone technologies and/or telecare (a range of devices and sensors that communicate and relay messages to an external call centre where an appropriate response is arranged). The installation and selection of the technology to be deployed was the responsibility of the local authorities involved. Those in the control arm were limited to a pendant alarm, non-monitored smoke and carbon monoxide detectors and a key safe, as recommended by the health or social care professional assessing their needs. Both arms could use additional support services, such as paid care, meals on wheels and attendance at day centres.

Participants were followed up for a minimum of 2 years or until they either moved into residential care or died. Over these 2 years, participants had five follow-up assessments, if they were still living in the community. After this time, they were invited to have a telephone assessment every 6 months until the end of the trial, for a maximum of 3 years or until the point of care home admission or death.

There were two co-primary outcomes to establish whether or not assistive technology and interventions (1) can extend the time that people with dementia can continue to live independently and safely in the community and (2) are cost-effective in the management of risk and in maintaining independence in people with dementia living in their own homes. Secondary outcomes were as follows:

- to establish whether or not these technologies can –
    - significantly reduce the number of incidents involving serious risks to safety and independent living, including acute admissions to hospital
    - reduce stress in family and other unpaid caregivers
    - increase quality of life for those with dementia and their caregivers
- to collect qualitative and quantitative data from people living with dementia and their formal and unpaid caregivers about their experiences of using these technologies.

All participants were included in an intention-to-treat analysis.

Results

Out of 495 participants, 248 were randomised to receive the full assistive technology and telecare package and 247 were randomised to the limited control package. We sought to describe the assistive technology and telecare intervention using the Template for Intervention Description and Replication (TIDieR) framework. We found a poor fit between the assistive technology and telecare needs and the assessment recommendations ($\tau = 0.242$; $p < 0.000$) and a moderate fit between the assistive technology and telecare recommendations and the installations ($\tau = -0.470$; $p < 0.000$). Furthermore, 62% of devices were installed for assistive technology and telecare needs that had not been identified in the assessment process, and 53% of devices recommended as a result of assessment were not installed by week 24. Median survival outside a care home was 127 weeks in the assistive technology and telecare group and 128 weeks in the control group (hazard ratio for institutionalisation over 3 years 0.76, 95% confidence interval 0.58 to 1.01; $p = 0.054$). After adjusting for an imbalance in baseline activities of daily living scores between trial arms, the hazard ratio was 0.84 (95% confidence

interval 0.63 to 1.12; $p = 0.20$). At 104 weeks, there were no significant differences between groups in health and social care resource use costs (intervention group – control group difference: mean –£909, 95% confidence interval –£5336 to £3345) or societal costs (intervention group – control group difference: mean –£3545, 95% confidence interval –£13,914 to £6581). At 104 weeks, based on quality-adjusted life-years derived from the participant-rated EuroQol-5 Dimensions questionnaire, the intervention group had 0.105 (95% confidence interval –0.204 to –0.007) fewer quality-adjusted life-years than the control group. The number of quality-adjusted life-years derived from the proxy-rated EuroQol-5 Dimensions questionnaire did not differ between groups.

Carer outcomes did not differ between groups over 24 weeks. Ethnographic research examining the way in which participants with dementia and carers were living with the technology found that technological mediation through assistive technology and telecare could replace, displace and disrupt co-located, face-to-face interactions.

Conclusions

A full package of assistive technology and telecare did not result in a significant increase to the length of time a person with dementia could remain living in the community, nor did it achieve decreases in caregiver burden, depression or anxiety. Use of the full assistive technology and telecare package did not increase participants' health and social care or societal costs. Quality-adjusted life-years based on participants' EuroQol-5 Dimensions questionnaire responses were reduced in the intervention, compared with the control group; the groups did not differ in the number of quality-adjusted life-years based on the proxy-rated EuroQol-5 Dimensions questionnaire. Work is needed to understand the impacts of assistive technology and telecare service configurations across public, voluntary and private sectors. Designers and service provider organisations should work with caregivers and people with dementia and their advocates to co-produce suitable technological interventions.

Future work

Future work could examine whether or not improved assessment that is more personalised to each individual is beneficial.

Trial registration

This trial is registered as ISRCTN86537017.

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This report

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