Telecare, obtrusiveness, acceptance and use: an empirical exploration

Abstract

Introduction: Telecare is increasingly part of the UK's health and social care arrangements, and therefore occupational therapists' practice. Understanding factors which influence telecare's acceptance and usage is important to ensure optimal outcomes, both for service users and health and social care systems.

Method: This paper uses data collected by a qualitative, multi-method, longitudinal research study (n=60) to explore whether an American model of 'obtrusiveness' (Hensel et al., 2006) is applicable to the UK context by examining what factors influence older adults' acceptance and use of telecare.

Findings: The obtrusiveness model is broadly applicable to the UK context, but there are also two further issues which affected the acceptance and use of telecare: the degree of control a service user feels they have and the information and support they receive in using their devices.

Conclusion: The obtrusiveness model, plus the two additions (control and information), highlight important issues which could assist professionals working with telecare, including occupational therapists, in ensuring telecare is both accepted and well-used.

Keywords: telecare, obtrusiveness, qualitative

Introduction

This paper examines the acceptance and use of telecare[i] by older adults (65+). Telecare, telehealth and assistive technology are on the UK policy agenda, with their roots in the 1960s sheltered accommodation schemes' pull-cord systems (Fisk, 2003). These devices are also increasingly part of occupational therapists' professional repertoires and are likely in future to become even more integral, as highlighted by the British College of Occupational Therapists (2007) and the Department of Health (Riley et al., 2008). Despite this push for telecare at the national policy level, provision amongst local authorities is fragmented and uneven and therefore the types of equipment, assessment, installation, monitoring and response services differ greatly between localities, as does the role of occupational therapists within these systems (Smith, 2002; Hawley, 2002; Verdonck et al., 2011). Nonetheless understanding of the factors affecting acceptance and optimal usage is beneficial for occupational therapists working in this field as resources will always be wasted unless telecare is *used* after installation. This paper applies the framework of 'obtrusiveness' created by Hensel et al. (2006) to qualitative, longitudinal data collected via a multi-method approach with 60 older adults to address issues which can influence telecare's acceptance, rejection or suboptimal use.

Literature review

Previous research has highlighted issues which affect the acceptance and use of telecare, including: stigma (Hamblin, 2014; Pritchard and Brittain, 2014); false alerts (Brownsell and Hawley, 2004; Hamblin, 2014); devices' appearance (Doughty et al., 2000); privacy (Brownsell and Hawley, 2004); and personal circumstances, including prior experience of social care (Londei et al., 2009, McCreadie and Tinker, 2005; Yeandle, 2014a; Hanson et al., 2008; Pape et al., 2002). The reality may be an extremely complex interplay of factors and as such, Hensel et al. (2006) created a conceptual framework of obtrusiveness in relation to telehealth and assistive technologies following a review of the literature. 'Obtrusiveness' is something which is "*undesirably prominent or obtrusive either physically or psychologically – or both*" (ibid: 430). For example, physical obtrusiveness may include the discomfort of wearing a telecare device whilst psychological obtrusiveness can be manifested in users' feelings of anxiety or frustration. The authors highlight that obtrusiveness is context- and person-specific, and include not only users but also those who care for them in their model, with 22 sub-categories grouped into eight dimensions (Table 1).

Table 1: Hensel et al.'s (2006) obtrusiveness model

Dimension	**Subcategories**
Physical	1. Functional dependence 2. Discomfort 3. Excessive noise 4. Obstruction 5. Aesthetic incongruence
Usability	6. Lack of user friendliness/ accessibility 7. Additional demands on time and effort
Privacy	8. Invasion of personal information 9. Violation of the personal space of the home
Function	10. Malfunction/ sub-optimal performance 11. Inaccurate measurement 12. Restricted distance/ time away from home 13. Perceived lack of usefulness
Human Interaction	14. Threat to replace in-person visits 15. Lack of human response in emergencies 16. Negative effects on relationships
Self-concept	17. Symbol of loss of independence 18. Cause of embarrassment
Routine	19. Interference with daily activities 20. Acquisition of new rituals
Sustainability	21. Affordability concerns 22. Concern about future needs

Source: adapted from Hensel et al. (2006: 429) and Courtney et al. (2007: 243).

Hensel at al.'s paper states further empirical work is needed to establish which factors have the greatest effect on the adoption and usage of telehealth devices. As such, this paper explores the applicability of this framework using empirical data gathered on telecare in the two selected English research sites, as well as the varying impact of the dimensions of obtrusiveness on uptake and usage. The model has been applied to smart homes via secondary data analysis to an American context (Courtney et al., 2007) and therefore this paper applies it to the English context for the first time to the author's knowledge. The research questions addressed in this paper are therefore: 1) whether Hensel et al.'s (2006) obtrusiveness framework is applicable empirically to the English context; and 2) what is impact of the dimensions of obtrusiveness on the acceptance and use of telecare?

Method

The data analysed using Hensel et al.'s (2006) framework were collected during a study designed to examine the daily experiences of telecare. The methodology used – 'Everyday Life Analysis' (ELA) (Yeandle et al., 2014b) – included ethnographic observations and qualitative interviews supplemented by creative methods including photography and diaries. The study's inclusion criteria were that the participants: had memory problems and/or susceptibility to falls; were living in the community; were aged over 65; and were either 'new' users (with devices about to be installed for first time with a change of circumstance such as bereavement or hospital discharge prompting self-referral or referral by a health or social care professional to the local telecare services) or established (with devices installed approximately 12 months previously) telecare users. Recruitment was arranged in partnership with two telecare services (one in a northern city and one in a southern county), the Thames Valley Dementia and Neurodegenerative Diseases Research Network and Oxford Health NHS Foundation Trust who approached existing telecare users and those who had been recently referred to the telecare service awaiting assessment. The researchers all received ongoing and extensive training from the Bradford Dementia Group to ensure their engagement with participants with cognitive impairment was appropriate and sensitive.

Participants were visited 4-6 times over 6-9 months in their own homes, with variation owing to the physical frailty or other demands the participants' time. This longitudinal aspect was key, allowing for the observation of changes in participants' attitudes towards telecare over time, influenced not only by their use of the devices and their interactions with the services supporting them, but also by broader changes in their lives. It also meant the insight gained was less intense and intrusive for participants. The sessions were also conducted by the same researcher each time to build trust and rapport. During these visits, the research team of four post-doctoral research fellows made ethnographic observations related to the context within which telecare was situated using an observation template, including how the devices were used (such their location in the home, any problems encountered, the effect on those providing care and support). They also conducted semi-structured qualitative interviews which were audio-recorded and transcribed, with topic guides focused not only on telecare and any changes that had occurred between sessions, but also issues relevant to the older person. The research design enabled any family members, friends, neighbours, carers or care workers providing support to be included (with the older person's consent). Where appropriate participants were offered a tailored 'ELA box' which typically included a notebook with guidance on its use as a diary, a disposable camera, and paper and stamped-addressed envelopes for writing to researchers. The participants' approaches to the diaries varied, with some recording at length daily activities, concerns and feelings whilst others made bullet point-style notes. The photographs taken tended to focus on three main areas: the people in their lives; their home and the localities they visited; and things which helped them, including telecare devices and other equipment. For this paper, data was coded using computer-aided techniques in accordance with a framework based on Hensel et al.'s (2006) model, with open coding to also allow for the inclusion of additional factors affecting uptake and usage of telecare.

Findings:

The final sample included 60 people[ii] aged over 65 who were either susceptible to falls or had cognitive impairment (35 in the former, nine in the latter and 16 were in both categories). The characteristics of the sample are listed in Table 2 in which a 'telecare package' is defined as at least two items of equipment, which may or may not include a pendant (or wrist-worn) personal alarm (more information on the sample and method can be found in Yeandle, 2014b). The study's qualitative nature means a representative sample of the wider population of telecare users was not the aim; indeed issues with the data collected by the local authorities meant that creating an accurate picture of this wider population was not possible. Though some may argue this affects the generalisability of the findings, the in-depth methodology provided a valid picture of the use of telecare by older people in these two authorities.

Table 2: Sample characteristics at recruitment to the study

Characteristic	Northern city (n= 24)	Southern county (n= 36)	Total
Gender	*Female:* 14	*Female:* 25	*Female:* 39
	Male: 10	*Male:* 11	*Male:* 21
Age	*60s:* 3	*60s:* 3	*60s:* 6
	70s: 8	*70s:* 12	*70s:* 20
	80s: 12	*80s:* 11	*80s:* 23
	90s: 1	*90s:* 10	*90s:* 11
Living alone	*Yes:* 16	Yes: 25	*Yes:* 41
	No: 8	No: 11	*No:* 19
Unpaid carer	*Yes:* 23	Yes: 33	*Yes:* 56
	No: 1	*No:* 3	*No:* 4
Paid careworker	*Yes:* 11	*Yes:* 13	*Yes:* 24
	No: 13	*No:* 23	*No:* 36
Telecare	*Pendant alarm only:* 2	*Pendant alarm only:* 30	*Pendant alarm only:* 32
	Telecare package: 21	*Telecare package:* 4	*Telecare package:* 25
	Other: 1	*Other:* 2	*Other:* 3

Note: Devices included in telecare packages (defined as two items or more) linked to monitoring centres: GPS devices; bed, door and chair exit sensors; carbon monoxide, smoke, flood and temperature extreme sensors; reminder systems; medication dispensers.

To return to the first research question which explores the applicability of Hensel et al.'s paper by examining data related to the rejection or misuse of telecare, issues which correspond with their model were identified and are outlined below, as well as two additional concerns which are nonetheless important factors in determining whether participants accepted and used their devices. The second question this paper seeks to explore – the impact of the various dimensions of obtrusiveness in terms of the misuse and abandonment of devices – is also woven through this section. All names used in the following section are pseudonyms.

First, in terms of the model's **physical** dimension, dependence on telecare specifically was not a significant concern for the study's participants, and nor were there issues related to obstruction as the devices tended to be physically small. On occasion, participants did report issues related to excessive noise from reminder equipment or during false alerts which could be unsettling or annoying, and in some cases did lead to the abandonment of devices, demonstrating the impact of this dimension of obtrusiveness. The appearance of devices, particularly pendant alarms, was an issue for many of the participants and they were often tucked beneath clothing, affecting their usability in an emergency. Some felt devices when coupled with other aids for walking marked them as prematurely 'old' or were incongruent with their clothing or general appearance. One participant noted: *"The hospital said, 'We're going to order you a watch for your wrist, a pendant.'…When I got it, they came here and said, 'There's your new watch.' I said, 'What an ugly thing'… I thought, 'I'm not going to have that on, I'll take it off'"* ('Mrs Small', 80s). The pendant alarm cords too were a source of embarrassment, becoming discoloured quickly and causing some chaffing and discomfort, as one participant noted *"I want a gold chain. I don't like the rope! Could they not make like a little bracelet? Yes, it's for an emergency. You can't expect it to be beautiful, but when the gold ones come out I want to be first on the list"* ('Mrs Tyne', 90s).

Lack of user friendliness, in terms of the **usability** dimension, was an issue for devices requiring participants to activate them, as conditions such as arthritis made this difficult and though the manufacturer provided accessible adaptors, their prevalence in the sample was limited. Participants and carers alike were concerned about additional demands on time as they worried about the ability the devices required, especially if unfamiliar with technology generally. For example, one carer recounted an incident with a medication reminder: *"I thought to myself, 'oh, it's probably the battery, so I'll put the new ones'. Then I put the new ones in, error message, 'scream, scream, scream'. So I'll have to phone them. And you see, this is another thing about being a carer- there's always one more phone call to make, yet another arrangement. Oh, it exhausts, it genuinely exhausts me"* (family member of 'Mrs Barnard', 80s). Related to this was the impact on carers' time if devices were used as many participants reported they had not pressed their pendant alarms when they had fallen as they did not want to disturb those who cared for them, as one explained: *"I didn't want to bother her* [daughter] *or my son for that. They both said, 'Why didn't you tell us? We'd have come', I said, ''I know you would have done but if I can manage, I will manage'"* ('Mrs Cash', 70s). Participants frequently used the language of not wanting to 'bother people' as the rationale for not using their devices in an emergency.

Privacy did not emerge as a significant issue for the participants, perhaps a reflection that many had only 'reactive' first generation pendant alarms which they may not have felt had the capacity to 'spy' or collect personal information. In terms of changes to the home environment, though the installation of telecare did not involve a significant disruption to her home environment, it was ‘bound up’ with broader, unwelcome, changes. For some, as previous sleeping and toileting arrangements were made inaccessible by stairs, ‘front rooms’ which were once for socialising became ‘multipurpose’ spaces when beds, commodes and other aids were installed. In addition, familiar objects were removed to make way for items such as hoists and hospital beds, upsetting some participants as did the shift in the function of these rooms from social spaces to more private spaces. One participant noted about the changes made to her home, including the addition of telecare: *“When I came in from hospital, she said, ‘We've had to move things so you won't fall’, and I said, ‘It isn't my house now.’ I've been here forty-four years and it looks entirely different”* (‘Mrs Small’, 80s). For others, when accompanied with these wider changes, telecare would be accepted as compared to what participants felt was ‘the next step’ (residential care or moving home), the devices were seen as the ‘least worst option’.

Participants also reported issues related to the **functionality** of the devices. In relation to malfunction or sub-optimal performance, a few in the study made negative comments about response arrangements when alerts were triggered, as they felt the responders took too long to reach them when they had activated their devices in emergencies; as a result in two cases participants chose alternative providers. Inaccurate measurement with some devices could be off-putting (with bed sensors and, in particular, fall detectors cited as either too sensitive or not sensitive enough to record a ‘soft fall’) and lead to their removal. A further issue related to functionality was the perception of usefulness and there were participants who felt that the telecare was not really ‘for them’ but was there to provide reassurance to those who cared for them. As such, some only wore their pendant alarms when they were expecting their carers as visitors, and not when they were alone (and arguably when the risk was greatest). Restriction in distance or time away from home was applicable to GPS devices which needed to be recharged and pendant alarms in cases where participants’ large gardens would put them out of range of the receiver, limiting the activities they felt comfortable doing outside.

The **human interaction** dimension, such as the threat to in-person visits was not cited by participants as a concern, though one did note *“bring all the technology want in, but it doesn’t replace people”* (‘Mrs Woolley’, 80s). Regarding human response to emergencies, those who had used their telecare device generally were positive, with the exception of a few who felt the response teams did not arrive quickly enough. Equally important was the response participants received when they accidently activated their device, as one noted: *“the great comfort is knowing that when you hit that, and they speak to you, they’re so nice…if they said, ‘What do you want?’ That would be put me off, yes. But they say, ‘Now, are you sure you’re okay’”* (‘Mrs Barnard’, 80s). There was criticism related to coordination between different parts of the system: for example, one participant found they could not use their alarm to speak to their support worker and in a few cases, there was a lack of coordination between the response centre and the installation team when adjustments were requested by participants. There was for some a positive effect on relationships as telecare’s installation was seen as a way of reducing the strain on caring networks by providing with reassurance. Linked to the discussion of additional demands on time (usability dimension), this occasionally led to a paradox: though telecare was often installed to provide safety and security for the older person and 'peace of mind' for those caring for them, some participants were reluctant to activate the telecare as they felt this would make them a 'burden' to those on their response list. Participants often made the distinction between 'bad' falls which required the use of telecare and 'slips', 'trips' and 'stumbles' which would not; the latter were at least initially kept from family members, creating tensions in caring networks. In addition, false alerts were of particular concern and led participants to remove their telecare, in particular at night, when showering or in a few cases, more permanently. Carers were often accepting of false alerts as the security the telecare provided outweighed such shortcomings. For a minority however, telecare could have a negative effect their relationships with those who cared for them as they felt 'nagged' to wear their devices, with one participant noting: *"I do as I'm told regards to this thing. It's like being at school again- what you should do and shouldn't do"* ('Mrs Bates', 80s).

A key issue for many participants which affected their use of telecare was the way it interacted with their **self-concept**. As explored in terms of the privacy dimension, some saw it as a trade-off, as though accepting telecare was a sign that they were vulnerable, it also reduced risk and therefore the likelihood they would have to take more drastic steps, such as moving home. A participant explained: *"It gives my daughter peace of mind because she lives quite a way off and with the panic button and such like, someone would always be there if I needed them… She had wanted to change her dining room into a bedroom and I said, 'You're not changing your house for me. I'll go to my own home.'"*. ('Mrs Tyne', 90s). This also is linked with issues related to telecare as signifying a loss of independence, as though many research participants felt the telecare was unsightly and therefore potentially stigmatising, it was also a 'good idea' when seen as part of a 'bigger picture'- if it could help them achieve their ultimate goal of remaining independent, active and easing their caring networks' concerns, they overlooked its appearance. Some noted that their telecare preserved their independence: "*as you get older and you have to depend on maybe other people or different things, you feel it's part of your independence being taken away, but then when we got it and we realised it freed us up from worry, so that bit of independence had actually been given back to me"* ('Mrs Swallow', 60s). An additional threat to the identity of participants as active and independent was social embarrassment, linked to feelings around being seen as 'old' by others, which some combated by 'reframing' 'old-age identifiers' such as telecare to reduce the stigma associated with them, with some opting to reframe their pendant alarm as 'lucky charms', reminding them to 'go steady'.

Generally, the participants' telecare devices did not change or restrict their daily activities or **routines,** aside from remembering to wear their pendant alarms, fall detectors or GPS devices. Conversely, many reported activities were enhanced as areas of their homes which had become inaccessible or 'out of bounds' following injury or illness such as gardens and staircases felt 'less risky' with telecare. In the wider community, GPS devices provided sufficient reassurance for the carers of participants with memory problems to enable them to continue to go out alone. However, for a few participants, bed sensors created new routines and risks, as they felt they had to 'rush' to get back to bed before an alert was triggered.

Issues of cost and the **sustainability** of telecare did arise. The research took place in two different local authorities with different commissioning arrangements. At the start of the study, one provided a free service, yet as the fieldwork was ending, participants received a letter informing them that fees would be introduced the following year. Some participants were unsure whether they would continue to use the service. In the other local authority, the telecare service was means-tested, which too caused concern for some as the financial assessment outcome was revealed around five weeks after telecare installation, creating a great deal of uncertainty. It was also clear that some care professionals involved in the assessment and installation of the telecare did not understand the charging policy and misadvised some participants. Future needs had an inverse effect on obtrusiveness for some participants: rather than rejecting telecare because it may not meet future requirements, some had it installed to meet needs they were anticipating.

Though most of the obtrusiveness model applied to the data to varying degrees, two key additional issues emerged. **Control** was important first in terms of the decision to install telecare, or instigate other changes to the home, as where participants felt ‘powerless’, they were less likely to accept their devices or view them positively. As one participant noted telecare was part of a wider set of changes: “*I’m now beginning to understand as age is catching up with me that I am being forced – notice my word here – I am being forced in little ways to become dependent on somebody else. I’m being checked up on… it’s an interesting aspect but not one that I necessarily like. I’ve been too independent for too many years… it’s nice to know that they are there in the background but, how can I put this, I don’t want to become dependent”* (‘Mr Eaves’, 70s). Second, control was important in terms of using the devices as one participant noted: *“As long as I can control it, you know. You know, there are some decisions I have to make for myself, I feel, and what I can cope with, what's best”* (‘Mrs House’, 80s). This issue of being able to control the outcome of using pendant alarms in particular – being able to decide whether an ambulance, a carer or an agency responder was sent – was important to participants. Though in theory whenever an alert was triggered by all home-based devices in the sample, the participants should have had the option to cancel the call verbally or give instructions to the response centre, many were sceptical, noting this would be more difficult if they were incapacitated away response box, which in turn made some reluctant to use their alarms.

The second important factor not included in the obtrusiveness framework but influencing the use of telecare in the sample was **information and ongoing support**. When asked how their telecare devices worked, or what would happen when they were activated, participants often reported confusion. Many who had never activated their telecare device(s) were unclear about what would happen if they did; they were unsure as to who would answer the call, whether an ambulance would attend and how the responder would access their property. This was in part due to difficult circumstances when telecare was installed – often following bereavement, illness, or as part of hospital discharge arrangements – but also related to information provided at installation, which was in some cases incorrect (e.g. whether pendant alarms could be worn in the shower) or incomplete. Users’ knowledge of how to use the devices had an impact on the uptake and usage of telecare: if participants were unsure, they tended to avoid using the devices. A further issue related to information was participants' expectations regarding the response. Devices and response arrangements could work entirely as planned but if the participant had a different understanding of what would happen, this was very disconcerting, particularly when an emergency responder attended instead of a family member. These first experiences were crucial, often determining whether the participants would ever use their devices again.

Discussion and implications:

Telecare devices are increasingly important to occupational therapy practice due to their prominence in health and social care arrangements and without a clear understanding of factors affecting usage, telecare is likely to fail to live up to the promise presented by policymakers. When analysing this project's data, it is important to emphasise that there were many positive experiences and attitudes towards telecare amongst the sample, from those who had successfully used their devices in an emergency to those who had yet to do so but nonetheless 'felt safer'. Yet at the same time, there were many in the sample – including some who argued they felt safer with their devices – who were not using their telecare as intended: for example, not wearing their pendant alarms or not activating them when they fell. On the surface, therefore, telecare had been installed without issue and risks within the home reduced, but in reality some participants were unable or unwilling to use their devices in an emergency. With this in mind, this paper applied a model of obtrusiveness developed in America (Hensel et al., 2006) to the English context to establish whether it could provide lessons for practitioners involved in the delivery of telecare, including occupational therapists to both address issues related to risk for service users and wasted resources. The model was largely applicable, though this paper also highlighted two further issues related to the installation and introduction of telecare which had a bearing on the acceptance and use of devices by a sample of older adults: the degree they felt in control of their social care arrangements and the information and support they received in using their devices. These issues should be important considerations for any professionals working with telecare to maximise its acceptance and effective use.

In terms of the limitations of this paper, the qualitative nature of the study means that a representative sample of telecare users was not the aim and the generalisability of the findings may be critiqued, as discussed in the Methods section. The sample included only people who had telecare installed in their homes and as such does not include those who had completely abandoned all devices who arguably are those who may have found issues related to obtrusiveness hardest to overcome. However, within the sample there were those who despite having telecare in their homes were not actively using their devices and indeed a few had some items uninstalled during their involvement in the study, providing important insight into the factors influencing these decisions. Future work should include those who have abandoned or refused *all* devices to address whether the same model of obtrusiveness applies. In addition, a practical guide for professionals involved in telecare delivery influenced by this model of obtrusiveness and this paper's empirical findings also merits further work.

Conclusion

This paper explored the factors which influence telecare's acceptance and optimal use by older adults. Telecare is a key part of health and social care arrangements, and consideration of issues related both to the obtrusiveness model outlined and explored empirically above will help professionals ensure devices are accepted and used effectively. In addition, two further issues which affect the uptake and use of telecare – the degree of control a person feels they have over their health and social care arrangements, and the information and support they receive in using telecare – emerged from the data. These aspects were integral to the experience of telecare by the participants, and determined whether or not they would accept and use the devices as intended.

Key findings

- Obtrusiveness (Hensel et al., 2006) affects the adoption and usage of telecare.
- Feeling of control over social care arrangements, including telecare, and information and support are also important.

What the study has added

Occupational therapists should consider the obtrusiveness of telecare when offering them as part of wider support arrangements as this impacts uptake and subsequent usage. Control and information are also key.

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[i] Defined as *"equipment and detectors that provide continuous, automatic and remote monitoring of care needs emergencies and lifestyle changes, using information and communication technology (ICT) to trigger human responses, or shut down equipment to prevent hazards."* (Scottish Government, 2008)

[ii] Initially 70 people were recruited and of these, 10 (nine in the northern city and one in the southern county) withdrew prematurely because of a deterioration in health affecting the research participant or his / her spouse and in two cases a research participant died before completing the study.