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Remote Health Care Provision in Care Homes in England: An Exploratory Mixed Methods Study of Yorkshire and the Humber †

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Abstract: An increasing demand for care homes in the UK, has necessitated the evaluation of innovative methods for delivering more effective health care. Videoconferencing may be one way to meet this demand. However, there is a lack of literature on the provision of videoconferencing in England. This mixed-methods study aimed to map current attitudes, knowledge and provision of videoconferencing in the Yorkshire and Humber region of England. Qualitative interviews with care home managers, a scoping review and field notes from a Special Interest Group (SIG) informed the development of a descriptive convenience survey which was sent out to care home managers in the Yorkshire and Humber region of England. The survey had a 14% (n = 124) response rate. Of those who responded, 10% (n = 12) reported using videoconferencing for health care; with over 78% (n = 97) of respondents' care homes being based in urban areas. Approximately 62% (n = 77) of the 124 respondents had heard of videoconferencing for health care provision. Of those who reported not using videoconferencing (n = 112), 39% (n = 48) said they would consider it but would need to know more. The top ranked reason for not introducing videoconferencing was the belief that residents would not be comfortable using videoconferencing to consult with a healthcare professional. The main reason for implementation was the need for speedier access to services. Those already using videoconferencing rated videoconferencing overall as being very good (50%) (n = 6) or good (42%) (n = 5). Those who were not using it in practice appeared sceptical before implementing videoconferencing. The main driver of uptake was the home's current access to and satisfaction with traditionally delivered health care services.

Keywords: care home; nursing home; videoconferencing; remote health care

1. Introduction

This is a conference paper for a special edition journal, related to the Association for the Advancement of Technology in Europe (AAATE) conference (2017), under the theme "Harnessing Technology to Improve Lives" [1].

It is estimated that 400,000 residents are now living in care homes in the UK [1]. Many have based their decision to move on the nature of their needs, for example enduring a disability that can no longer

be supported in their own home [1,2]. Due to the increasingly aging population, it is likely that the need for care homes will increase across England [3]. This will necessitate the development and assessment of innovative methods for delivering efficient health care in care homes [4]. Videoconferencing has been trialled in care homes in a range of countries with the aim of improving resident access to health care for a wide range of purposes, such as; assessment [2–9], management [10–14] and diagnosis [15]. Associated evaluation and research has looked at a range of clinical outcomes such as; hospital admissions [3,16–20], A&E attendances [21] and medication use [13], with the main body of evidence originating from America [2,3,8,9,12–15,19,22–24].

A scoping review previously undertaken identified relevant research to inform survey content. The most popular research design reported in the search yield was case studies, exploring the feasibility of videoconferencing in different care home contexts [25]. All (26) papers identified in the review reported on outcomes post- implementation of videoconferencing and consequently no information was identified regarding the knowledge/attitude of staff and residents pre- implementation. Nine papers reported evidence suggesting that staff satisfaction is high in care homes using videoconferencing [2,7,8,12,14,17,21,22,26]. However, Vidyo (2018) has since commissioned a study to look at the primary reasons for non-adoption of virtual health services in America. Three of the main reasons identified were due to cost, others include: infrastructure, staffing, privacy and concern over successful integration of health care records [27].

Three papers identified in the scoping review explored the use of videoconferencing in the UK [11,18,20], with two looking at videoconferencing in care homes for older adults [18,20] and one looking at the use of it in psychiatric patients [11]. Both Pope et al. (2013) and Hex (2015) found videoconferencing reduced health care costs and emergency department attendances. Hex (2015) observed these effects in care homes that used the 24/7 Airedale hub.

Airedale NHS Trust established a Telehealth Hub in 2011 and since then have implemented videoconferencing in 534 care homes across the Yorkshire and Humber region [28]. Services include; the Gold Line (a line that provides support for palliative care) and the intermediate care hub where staff can be called 24 h a day, seven days a week for advice about residents' health. If deemed necessary calls can be escalated to emergency care staff, a doctor at the hospital or an out-of-hours GP [29].

However, despite this innovation in service delivery in one region of England, there is a deficit of literature on other providers of such services and on care home managers' perceptions of videoconferencing across England [5].

The survey described in this paper aimed to explore the use of videoconferencing to access health care in English care homes, identifying levels of knowledge of, and attitudes towards videoconferencing. The survey was conducted in early 2015, with the findings being used to inform Clinical Commissioning Groups (CCGs) who commission the majority of hospital and community NHS services in England [30] and health care professionals regarding the current state of provision as part of larger evaluation. The findings from the study were reported as guidelines for commissioners and health professionals [31].

2. Materials and Methods

Qualitative interviews were used to develop a cross-sectional survey to enable the interpretation of views from a range of care home managers [32]. Four care home managers took part in the qualitative interviews and 124 participants were included in the analysis for the survey. In total 124 participants took part.

The content for the survey (See Supplementary) was developed following five key stages defined by Steven (2012) [33]. The first was identifying participants to inform the development of the survey. Due to time constraints, the researcher invited care home managers at a Special Interest Group (SIG) to participate. This event was one in a series of special interest groups held by Sheffield University, UK and was organised to raise awareness of technology's potential for the care sector and to foster discussion. Attendees included care home managers, healthcare workers, technology providers,

researchers, staff from the local authority, NHS Trusts and service commissioners. Two of the care home managers were from nursing homes (one home that used videoconferencing and one that did not) and two managers from residential homes (one home that used videoconferencing and one that did not). The second step was to decide on the method and design of interviews for survey development. In order to explore participant's experiences and allow for cross-case comparability semi-structured interviews were used [34]. The interview guide that was developed, considered the information needed in order to map current provision, attitudes and knowledge of videoconferencing in the region. The findings were analysed thematically. Where concerns had been raised regarding the benefits of technology or videoconferencing, these were used to inform response categories (for example, reasons for why homes may not want to implement videoconferencing), as well as to identify other possible factors that may influence uptake and effectiveness. The findings from the scoping review [25], notes from the SIG and the interviews (See Supplementary) were used to inform/refine the response categories for the survey. This ensured that the most pertinent factors were represented in the survey, with the categories being exhaustive [35]. The interviewed participants then piloted the questionnaire either in the postal or online format. The observations of those who completed the pilot survey informed the development of the instrument to make it more concise and questions were re-worded where participants stated these were unclear [35].

The survey was composed of a range of ranking, likert scale, multiple choice and open ended questions to enable the collection of a broad range of data. Open ended questions were included to allow the respondent to provide additional feedback [32]. The instructions highlighted that the survey would take between 10–15 min to complete. The researcher posted the survey and covering letter to 859 care homes registered with the UK Care Quality Commission (CQC) as caring for people solely over the age of 65, with the intention that the manager would complete it. The cover letter included a link to the online version of the survey and information on the prize draw they would be entered into upon completing and returning the survey. The researcher believed this would help improve the response rate. The researcher received ethical approval from the School of Health and Related Research (ScHARR) ethics committee for this study.

3. Results

3.1. Qualitative Interviews

Information on the basic background of the care home such as; services available to the home, structure and funding formed the initial stages of the interview. Key technologies identified in the homes included: videoconferencing, telephone calls, sending images or video, sending physiological data, telecare and health informatics.

When considering the use of videoconferencing in the care home, challenges to implementing the system included the concern that residents would not be comfortable being seen in this way, concerns over the cost of staff training, the effect on quality of care and challenges in using the technical equipment; one manager disclosed that they were still waiting on access to Wi-Fi. Another interviewee cited reasons outside their control as the reason for not installing the system; reporting a lack of engagement in the topic from CCGs.

Perceived benefits of installing videoconferencing included:

- Reduced cost and reduced admissions.
- The potential to reduce staff workload, improved staff confidence in managing care and improved quality of care.

3.2. Cross-Sectional Survey

3.2.1. Participants

In total 131 responses were received, however six of these were excluded as respondents replied anonymously; omitting their consent for the data to be reported. Additionally, another respondent had responded twice, so here the initial response was included and the second excluded. Of the 859 distributed, 124 (14%) responses were included in the analysis. Of the eligible responses, eleven replied online (9%) and 113 (91%) replied by sending a paper copy back in the post. Three (2%) responses were included from participants who piloted the survey. One care home manager who took part in the initial interviews withdrew at this stage. Of the 124 completed surveys, 46 (37%) of respondents replied stating their youngest resident was under the age of 65.

Table 1 shows the breakdown of responses by Local Authority. North Yorkshire (25.81%) had the highest response rate. Other responses include: East Riding of Yorkshire (10.48%), Leeds (10.48%) and Bradford (10.48%).

Table 1. Response rate by region.

Local Authority	Responses N = (%)	Total Sample (%)
Barnsley	5/38 (13.16)	4.03%
Bradford	13/83 (15.66)	10.48%
Calderdale	4/36 (11.11)	3.23%
Doncaster	2/82 (2.43)	1.61%
East Riding of Yorkshire	13/47 (27.66)	10.48%
Kingston-Upon-Hull	2/42 (4.76)	1.61%
Kirklees	8/58 (13.79)	6.45%
Leeds	13/83 (15.62)	10.48%
North East Lincolnshire	2/33 (1.06)	1.61%
North Lincolnshire	5/34 (14.70)	4.03%
Nottinghamshire	1/20 (5)	0.81%
Rotherham	4/30 (13.33)	3.23%
Sheffield	10/70 (14.29)	8.06%
Wakefield	5/45 (11.11)	4.03%
York	5/27 (18.51)	4.03%
North Yorkshire	32/131 (32.06)	25.81%
Total	124/859 (14.43)	100.00%

In terms of rural/urban classification (an official statistic used by the UK government to distinguish between rural and urban areas) [36], over 77% of homes that reported using videoconferencing were from urban areas, with the remaining being from rural.

3.2.2. Characteristics of the Care Homes

Respondents predominantly managed privately owned care homes (76%), followed by voluntary/not for profit care homes (14%) and Local Authority owned homes (7%). A further 3% did not report on the ownership of the care home. Responses came from residential homes primarily (61%), followed by both nursing and residential (23%) and 13% came from solely nursing homes; again 3% did not report on the type of home at which they were employed.

When reporting on the average contracted hours per week (hpw) of allocated staff, care (778 hpw) and domestic staff (308 hpw) had the greatest number of contracted hours per week, then nursing staff (148 hpw) and senior management (101 hpw).

The mean number of residents reported as living in the care homes of respondents' was 34 and the range was between 3–123, (two homes reported the number of residents as 0 and four did not respond. This data was not included).

3.2.3. Characteristics of Residents

The mean age of the youngest resident was 64 and the range was 18–84. Forty-eight homes reported their youngest resident as being under the age of 65. The mean age for the oldest was 97.66 and the range was 64–109.

All respondents reported White British as being the dominant ethnicity of their residents.

Frailty and incontinence were the most prevalent reported conditions of residents, with 113 (91%) of the sample selecting these. Other popular responses included: diabetes (85%) and physical disability (84%). The least prevalent health problem reported was pressure ulcers. Another 10% of respondents reported other health problems, such as: mental health and rehabilitation. See Table 2 for more information.

Table 2. Most prevalent conditions reported in residents of care homes of respondents.

Condition	No. of Cases	%
Elderly frail	113	91
Elderly Mentally Impaired (EMI)	96	77
Physically disabled or immobile	104	84
Cardiovascular	103	83
Diabetes	106	85
Pressure ulcers	57	46
Incontinence	113	91
Palliative care	78	63
Other	12	10

3.2.4. Current Access to Health Care for Residents

The most frequently used health care service was onsite nursing with 39% of respondents reporting the use of in house nursing every day. Additionally, 25% of respondents reported using district nurses every day. Only 3% of respondents reported using unscheduled GP visits, GP clinics and GP out of hours' services every day and 2% of respondents reported using emergency services such as, 999 every day. Less than 1% reported that the home they worked in used ICT (Information Communication Technology) for health care and outpatient appointments every day.

Regarding ICT to access health care; 85% of respondents reported having access to Wi-Fi, 81% broadband and 97% having access to a phone line. See Table 3 for more information.

Table 3. The technology respondents stated that they have access to.

	Wi-Fi	Broadband	Telephone
	N = 124 (%)	*N* = 124 (%)	*N* = 124 (%)
Yes	106 (85.46)	100 (80.64)	120 (96.77)
No	13 (10.48)	13 (10.48)	0 (0)
Don't know	1(0.80)	3 (2.41)	0 (0)
Missing	4 (3.22)	8 (6.45)	4 (3.23)

Table 3 shows that the majority of homes reportedly had access to basic technology (85%) but that there were still homes without access to Wi-Fi (10%) and broadband (10%).

Out of the 124 respondents, 51% reported implementing an initiative to reduce hospital admissions; this did not have to be ICT based. Six responses were missing and 44% of respondents reported not implementing any initiatives the reduce admissions.

ICT initiatives cited included the Airedale Telehub services and the NHS helpline (111) who provide an out-of-hours advice and triage service [37]. One respondent reported the use of Emergency Care Practitioner (ECP) devices in the care home but did not elaborate on type and use.

Ten respondents described links with GP services, for example, locally enhanced services (providing additional provision than what is required by the general medical services contract, for example the care homes having weekly visits from the GP, having a GP clinic on site; the care home being linked to a GP practice, residents having weekly reviews with GP surgeries and through liaising with GPs to provide joint care plans [38]). Some respondents reported liaising with other services, such as:

- Rapid Assessment Time Limited (RATL) services provide unscheduled care practitioner services, such as; social care services and therapy services that run all day everyday [39]
- Frail and Elderly Assessment Support Team (FEAST) investigate and treat patients that do not need to be admitted to hospital [40]
- District nurses
- Monitors that involve all agencies if they have a problem - that is, falls, care home liaison team and so forth.
- Involvement of the care homes clinical nurse specialist team
- Working more with an Advanced Nurse Practitioner
- 111 out-of-hours assess/falls team/community psychiatric nursing team, rapid response team
- Weekly visits by the nurse, mental health teams and an ECP service

Others stated that they were trying to increase the skill base of the care home staff through training to replicate the hospital ward environment, and/or that they had additional services in the home, such as:

- Step-down beds in the rehab unit which provide a bridge between the hospital and care home when the resident is not yet ready to care for themselves again [41]
- A falls clinic
- A physiotherapist; falls prevention/physiotherapist;
- An enhanced care home scheme
- Intermediate care beds
- In-house hospice
- Increased use of clinical interventions on site
- Advanced care planning
- Hospital beds in situ
- Rehab beds.

Others mentioned procedures to prevent admissions, such as early intervention and initiatives to treat within the home.

3.2.5. Knowledge of Videoconferencing

Over half (62%) of respondents had heard of videoconferencing as a method of health care delivery. Figure 1 gives the breakdown of purposes of videoconferencing respondents reported being aware of.

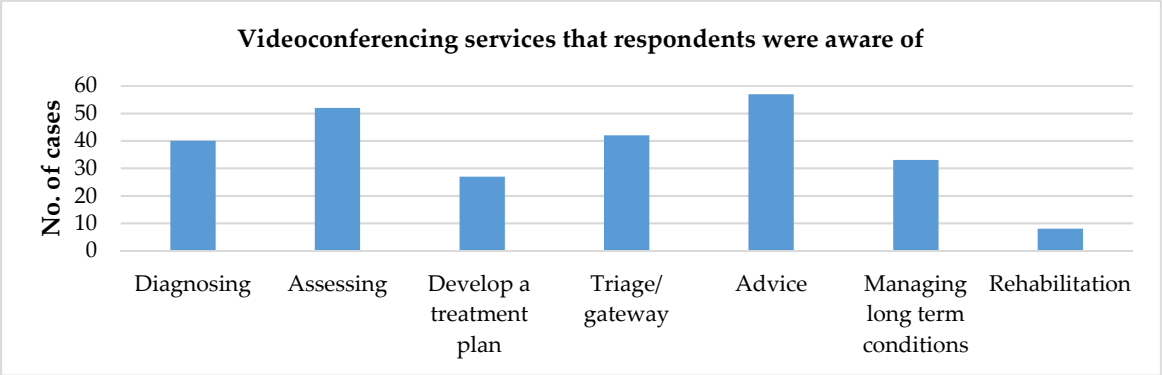

Figure 1. Breakdown of videoconferencing services that respondents were aware of.

Respondents most frequently reported being aware of videoconferencing services being used to provide advice, with 46% reporting being aware of this. Assessing closely followed with 42% reporting on this and rehabilitation was the least known usage, with only 6% of respondents' reporting having heard of use of videoconferencing for this purpose.

3.2.6. Attitudes and Views Towards Videoconferencing

Respondents then answered different questions depending upon whether the home did or did not use videoconferencing.

For care homes that did not have videoconferencing (n = 112), they were asked to select a statement that best represented their views of the technology driven service. Table 2 shows the breakdown in results.

Table 4 shows that 39% of respondents reported that they would consider videoconferencing but would need to know more. Then 16% stated that they were not sure it would be worthwhile, as they already have systems that work well. Another 11% thought it would be unnecessary and another 11% said they would sign up for it today if they could.

Table 4. Shows which statements responders selected most frequently.

Statement	*N* = 112 (90%)
I would sign up for it today if I could	14 (11.29%)
I would love to have it but will be unable to due to circumstances outside of my control	10 (8.06%)
I would consider it but I need to know more	48 (38.71%)
I am not sure it would be worth having as we already have systems that work well	20 (16.13%)
I think it is unnecessary and would only install it if it was made compulsory	14 (11.29%)
Other/missing	6 (4.84%)

Respondents who reported not using videoconferencing then ranked reasons for why they thought videoconferencing would be a good or bad service to implement. They were asked to rank a set of statements depending on their view (1 = the most important reason 7 = the least important reason).

Of the 109 (88%) that responded, 62% completed the question incorrectly, by either ticking statements, using the ranking system incorrectly or only partly completing the question. Additionally, 10% of respondents ranked both sets of statements and 0.02% of respondents did not complete this section (in addition to the twelve who reported using videoconferencing and so were not required to respond). Of the 28% who completed the question correctly, 57% were in favour of implementing videoconferencing and 43% did not think it would be worthwhile implementing. However, these findings do not include information from respondents' who completed this question incorrectly.

Table 5 shows how the statements were ranked by respondents who were in favour of implementing videoconferencing. 'Faster access to services' was ranked the highest, with 'reduced staff workload' being ranked the lowest.

Table 5. Pertinence of reasons to implement videoconferencing (ranked most to least important).

Rank	Reason to Implement Videoconferencing
1	Faster access to services
2	Improve quality of care
3	Reduce admissions
4	VC is as reliable as face to face
5	Reduce cost
6	Improve staff confidence
7	Reduce staff workload

Table 6 shows how the items were ranked by respondents who were reluctant to implement videoconferencing in the care home. The most pertinent reason was identified as, residents not comfortable being seen in this way. Training of staff and confidence in using the technology were ranked as being least important.

Table 6. Reasons for reluctance to implement videoconferencing (ranked most to least important).

Rank	Reasons Not to Implement Videoconferencing
1	Residents not comfortable being seen this way
2	Already have adequate access to services
3	VC is a threat to 'good care'
4	Time consuming
5	Not convinced it will help save money
6	Training staff time consuming and problematic
7	Do not have confidence in technology

One home stated that it would 'only save the NHS money and cost private care homes more' and another home stated that their residents like the reassurance of being able to see a GP and videoconferencing was too impersonal.

Additional concerns about videoconferencing included; the GP not being able to carry out a physical health exam, how resource intensive implementing the system may be, how the service may affect care in the home and the logistics of implementing the service. One respondent suggested that homes would need to know more, particularly about how the service works with residents with dementia.

The 12 respondents that reported using videoconferencing, were also asked to rank statements on why their home had decided to implement videoconferencing (Table 7). The findings were consistent with the views of those who believed videoconferencing would be beneficial but had not yet implemented it, with the most popular reason for considering implementation being the belief videoconferencing would increase the speed of accessing services. Respondents ranked reduced staff workload as least important.

Table 7. Reasons for implementing videoconferencing (ranked most to least important).

Rank	Reason Videoconferencing Was Implemented
1	Faster access to services
2	Improve quality of care
3	Increase staff confidence
4	Reduce admissions
5	Reduce cost
6	Reliable as face to face
7	Reduce staff workload

3.3. The Use of Videoconferencing to Access Health Care

Of those that reported using videoconferencing (10%), 50% reported the name of their service provider as 'telemedicine'. Valid responses included, Airedale telehub; 42% of respondents reported using these services. Then 75% reported using the nurse hub and 8% of the homes were using the 'gold line' service. One respondent reported 'Locala' as their service provider. Locala is a service that aims to deliver more integrated community services through using mobile networking; appointments can be made with their clinician through videoconferencing technology [42]. Four respondents reported installing videoconferencing in 2014, one installed it in 2012, two installed it in 2013 and 2015 and one home installed it in 2016. Two respondents out of 12 did not complete this section.

3.3.1. Hardware

Respondents predominantly described the telemedicine hardware as being composed of a laptop and web camera (91%). However, the care home that had previously reported accessing the Locala service described using a tablet device rather than a laptop. All respondents reported that residents needed support from care staff to access the service.

3.3.2. Purposes and Conditions Used

As shown below (Figure 2), respondents reported using videoconferencing predominantly to address problems linked to residents who were frail or mentally impaired. When asked about the frequency in which videoconferencing was used, 66% of respondents reported using videoconferencing less than once a week and 16% less than 3 days a week, 8% reported using the service once a year and one response was missing. Respondents reported using videoconferencing most frequently out of normal working hours; in particular Friday to Saturday evenings (18:01–00:00).

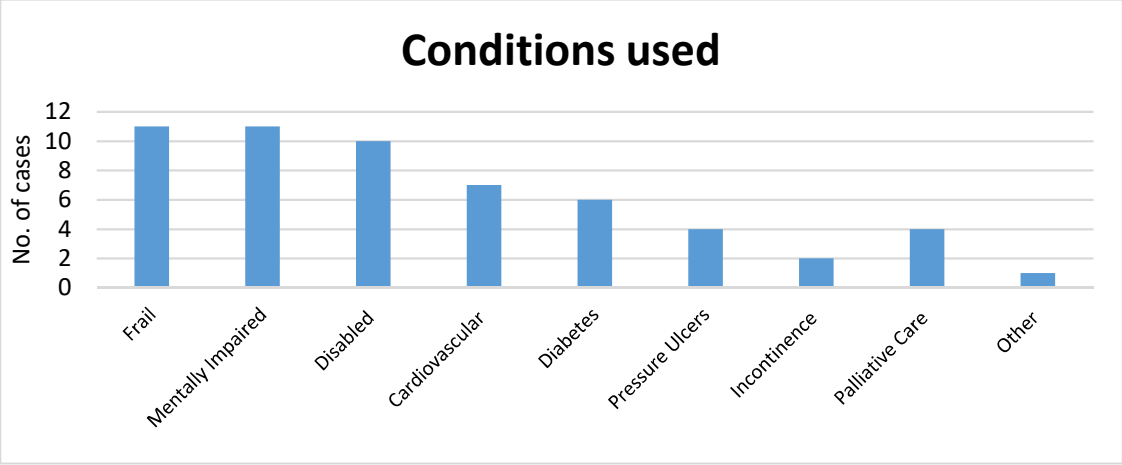

Figure 2. Conditions respondents reported using videoconferencing for.

3.3.3. How Respondents Rated Videoconferencing

Of respondents familiar with using videoconferencing, all rated it overall as being either good (41%) or very good (50%), showing a very high rate of satisfaction with the service with less satisfactory options going unselected. One response was missing.

When asked to rate predefined purposes for use, the most highly ranked was using videoconferencing for 'Assessing' (33% very good, 58% good) and 'Offering Advice' (58% very good, 25% good). Respondents ranked 'rehabilitation' the lowest with 33% of respondents marking videoconferencing as very poor for this and 33% rating N/A and 4 responses missing, implying videoconferencing is not widely used for this purpose.

Figure 3 shows that respondents' rated technical support (which included how long it takes the remote site to answer) and staff confidence as the most desirable parts of the service. Users also rated reliability and usability as good. Accessibility (the degree to which videoconferencing can be used by residents and staff) was rated as the least satisfactory, with one participant rating this as very poor.

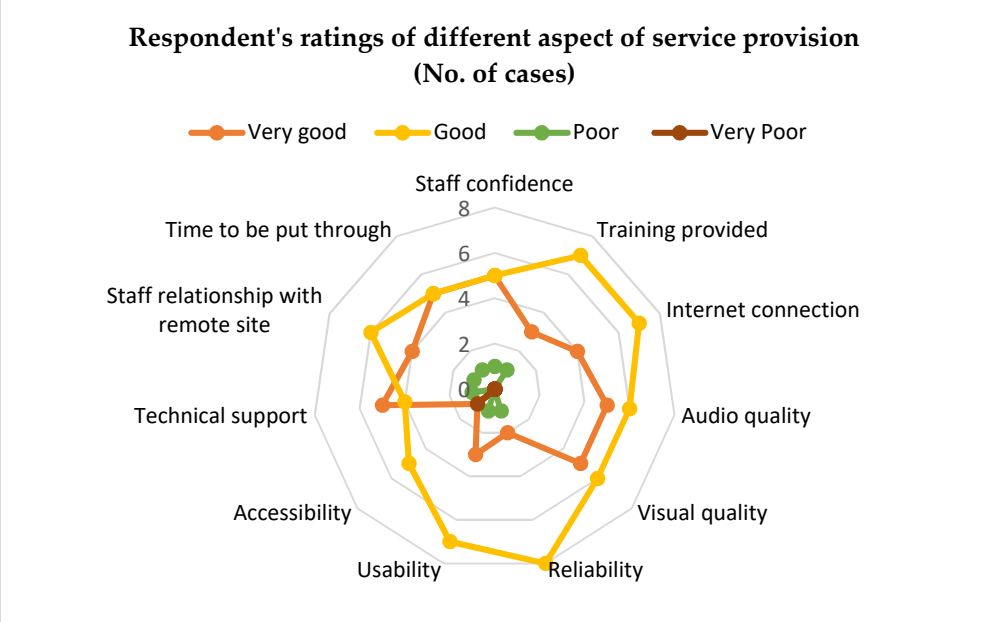

Figure 3. Respondent's ratings of different aspects of service provision.

Figure 4 shows that in terms of outcomes, respondents saw the greatest improvement in staff confidence in managing resident care, followed by improved resident comfort. Respondents rated workload, resident satisfaction and mental health of residents the lowest and one respondent rated continuity of care as being much worse.

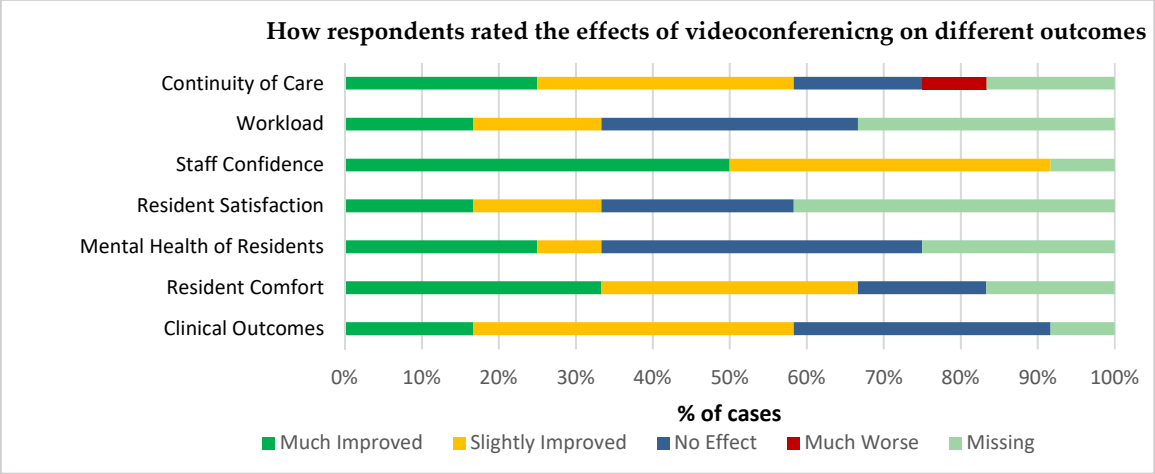

Figure 4. Breakdown of how respondents rated the effect of videoconferencing on outcomes.

4. Discussion

Prior published work reported a deficit in knowledge on attitudes, knowledge and views of staff towards videoconferencing in care homes prior to implementation and only nine papers had examined staff satisfaction post implementation.

The aim of this mixed methods study was to explore the use of videoconferencing as a means of improving access to health care in care homes; identifying knowledge, attitudes and views towards videoconferencing in Yorkshire and the Humber, England.

The response rate to the survey was limited with only 124/859 (14%) returned. There was difficulty in engaging this sector in research which could be due to time and resource constraints on care staff [8].

The majority of survey respondents were from private residential care homes. This could explain why, on average, contracted hours for care staff are higher than onsite nursing staff. The higher rate of residential to nursing home responses, may reflect differences in provision of or interest in videoconferencing.

Of the respondents that reported using videoconferencing, 78% came from care home managers in urban geographical locations and 22% were in rural. This is an interesting given that theory suggests videoconferencing would be of most benefit to those geographically isolated [43] and suggests that the uptake of videoconferencing may be influenced by more than geographical factors [25].

The average care home accommodated 35 residents, meaning most homes were relatively small in size. The dominant ethnicity of residents in all care homes was British, demonstrating a lack of diversity in terms of language and culture in care homes. Therefore, language and cultural barriers were not as pertinent as those in other studies [14].

The most frequently accessed health care services were face to face services, with respondents' reporting using out of hours and ICT services less frequently. This may indicate that there is a lack of confidence in using ICT or technology enabled services or concerns over quality of care when using ICT services over face-to face services. An alternative explanation may include residents not being comfortable consulting with a health care professional this way; this may be particularly pertinent in residents that have dementia.

There seemed to be a general awareness among respondents of how important it is to try and reduce hospital admissions, with over half reporting implementing some kind of initiative to try and reduce hospital admissions. Again, the majority of the services relied on face to face contact, with most reporting initiatives that include GP, community services or upskilling care home staff. However, 85% of homes reported having access to Wi-Fi and over half of respondents reported having heard of videoconferencing as a method of health care provision. This suggests a general distrust of technology or more confidence in traditional practices. Further findings reinforce this, with the

majority of respondents stating that they would need to know more before implementing it or that they were not sure videoconferencing would be worthwhile as they already had adequate service provision. Service providers should therefore ensure they effectively disseminate information about their services and allow care homes the opportunity to trial videoconferencing before committing to implementing it. More readily available information with regard to the cost of implementation may also be helpful in encouraging uptake. Where homes had implemented videoconferencing services respondents rated them as being either very good or good, suggesting respondents were more confident in using the technology after implementation.

Respondents reported 'faster access to services' as the most likely reason for implementing videoconferencing. Additionally, those who had no experience in using videoconferencing also rated 'improved quality of care of the residents' as being a pertinent reason for considering implementing the service. The most likely reason for not implementing the system was reported as 'residents not comfortable being seen in this way.' This suggests that if care home managers do not perceive there to be an advantage over other services, perhaps due to the lack of face to face communication, this may hinder uptake and suggests that dissatisfaction with alternative services may drive uptake. Participants ranked 'confidence in using ICT' as the least important issue, suggesting that confidence in being able to use videoconferencing may not be the biggest barrier to uptake. These findings are congruent with the findings of the qualitative interviews. However, it is important to note that a number of responses were reduced due to respondent error, on reflection, this might have been due to the ranking questions not being sufficiently clear, which may have influenced findings.

Four respondents reported videoconferencing being very poor for rehabilitation and reported using the service most frequently for residents who were elderly mentally impaired, elderly frail or disabled. As respondents reported as using videoconferencing most frequently out of hours; this suggests that dissatisfaction with currently available out of hours' services may be a driver to uptake and sustainability of videoconferencing.

Overall, videoconferencing was rated by those who had experience using it as being 'very good' or 'good,' meaning that post implementation users are generally happy with the service. With technical support, time to be put through to a member of staff at the remote site and staff confidence being the highest rated factors affecting service provision. This is in line with the above findings that staff confidence and speedier access to services are important in using the system and suggests technical barriers (any difficulty in using videoconferencing that negatively affects the outcome of the call) again may not be a pertinent problem. When reviewing outcomes, managers reported observing the greatest impact in staff confidence, suggesting staff became more confident in managing resident care as a result of having access to the system.

The findings from this survey suggest that greater dissemination of information about the potential uses of and cost of the service may assist in increasing the uptake of videoconferencing. The possibility of being able to trial the system may also be beneficial so that managers and staff have the opportunity to identify how they may be able to implement such a system in ways that will benefit residents and staff. This may be particularly pertinent in homes where staff may be unsure of benefit given their current access to health services.

Further, more in-depth research is required to get a better understanding of the mechanisms impeding and aiding the uptake and sustainability within the care home context, which include aspects of the organizational context such as leadership [44].

5. Limitations

The data obtained from the survey was descriptive, meaning that findings cannot be used to provide evidence for cause and effect relationships [45]. Also due to the poor quality of available data regarding care home registration and resident eligibility, this survey included responses from homes that accommodated residents <65 which may have influenced the findings. The potential for respondent bias may have also influenced the findings as only 12 managers of care homes using

videoconferencing replied; therefore the overall rating of the service post-implementation may not be representative of all care homes using videoconferencing.

6. Conclusions

Overall, videoconferencing was rated highly for most aspects by those who had experience of using it. The findings overall suggest that familiarization of use can ameliorate initial negative attitudes. It was significant that one of the main drivers to uptake was access to services currently available and perceived relative advantage.

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