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Impact of Implementation of Digital Record Systems on Service Setting A Case Study of Care Homes in the United Kingdom

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Abstract

Purpose

With the lifespan increase of the UK population, care homes are experiencing greater pressure to improve the quality of their settings to meet the demand for longer term care of residents. Among the biggest challenges for care home staff has been documentation management. Staff are required to accurately complete and submit care records during each shift as per the Care Quality Commission regulations. Technological advancement has allowed the UK health care sector to implement new digital systems to make the services more efficient and reliable. However, despite the increasing number of care providers using electronic care recording to capture data on service users, the research on the efficiency and efficacy of those systems remains limited.

Methodology

Survey and observational data were provided by an organisation managing 5 care homes in the United Kingdom, that have recently implemented an electronic care planning system. The authors analysed the quantitative data to compare the care note taking process in pre and post implementation of the e-system.

Findings

The statistical analysis identified that the total number of care notes being recorded had significantly increased across the sample. The e-system enabled an increase in fluid notes being recorded too. Survey data portrayed that 53% of staff felt using an electronic system improves accuracy and 67% agreed using a system let them record information quicker, although that does not result in staff having extra time to spend on “meaningful” activities with service users.

Research limitations/implications

The study provides an insight into whether an e-system brings sufficient return to justify the investment of its implementation, highlighting the exact areas of care and service quality impacted by its use. From an academic perspective, the research furthers the existing literature by demonstrating the impact of digital systems beyond medication intake recording. The study is practical for healthcare managers exploring the possibility of implementing an e-system, seeking to understand the benefits and limitations of such investment, presenting the views of both residents and staff.

Originality/Value

Technological advancement has allowed the UK health care sector to implement new digital systems to make the services more efficient and reliable. However, despite the increasing number of care providers using electronic care recording to capture data on service users, the research on the efficiency and efficacy of those systems remains limited.

Keywords: Care Home, Digital Healthcare, Electronic Care Planning, Electronic Care Record, Electronic Health Record, e-System, Healthcare, Residential Care

Paper type: Case Study, Analytical Research Paper

Introduction

Background

In 2021 the Office for National Statistics published that from 2018 to 2020, the average age of death in England was 83 years for women and 79 years for men. Trend shows peoples' lifespans are longer, which calls for additional assistance from health and social care sectors, such as supported living or nursing care. There are more than 14,000 care homes across England with a recorded population of over 360,000 residents in 2022 (Carehome UK, 2022). To meet the demand for care and increased number of service users, health and social care settings continue to find new ways of working to provide better care. The government regulation, Health and Social Care Act 2008 (Regulated Activities) Regulations 2014: Regulation 17, is the framework to ensure that a care setting has systems and processes in place to assure the quality and safety of the services being provided. Under this regulation, providers must keep accurate records for each service user.

17.2 assess, monitor, and mitigate the risks relating to the health, safety and welfare of service users and others who may be at risk which arise from the carrying on of the regulated activity.

17.3 maintain securely an accurate, complete, and contemporaneous record in respect of each service user, including a record of the care and treatment provided to the service user and of decisions taken in relation to the care and treatment provided.

(CQC, 2022)

In a residential care home, each service user must have a full care support plan which is person centered to manage the health and wellbeing of each person. Plans include forms, risk assessments, charts, and important documentation to support the care provider to take care of residents without removing independence. Plans are required to be regularly updated and reviewed (NHS England, 2022). In addition to plans, care homes are expected to complete daily monitoring or progress notes. The requirements vary person to person due to a difference in needs and variety of complexity. Each service user should have a note made each day to highlight any concerns or provide a recap of the day or night. Completion of paper documentation and communication are large, and crucial responsibilities of staff in the care

sector. With the growing demand for documentation driven by the regulators (Fournier, Gosselin and Rioux, 2006), alongside regulations such as CQC's Regulation 17: Good Governance (CQC, 2019), the desire to adopt an electronic system increases. Electronic systems are promoted as more accessible to be frequently updated, offer integration with other systems and are entirely legible, in that they do not suffer the consequence of poor handwriting (Pullen and Loudon, 2006). Equally, electronic record keeping can be more accessible by various locations or different devices, which is assumed to impact the amount of data that can be captured by staff.

As well as the capability to improve quality and experience of care (Sizmur and Raleigh, 2018), e-systems have been reported to improve safety with their rapid response and ability to track adverse events (Bates and Gawande, 2003). Residents that live in a care home are three times more likely to fall than those who live in the community and, although most falls result in minor injuries, 10% of falls result in fractures (Care Inspectorate, 2016). One main risk factor of falls is dehydration which can lead to weakness, therefore being aware of when someone is not drinking enough liquids is important. If a resident is identified to have fluid intake concerns, the care provider should be monitoring their intake and communicate any hydration requirements (Lea et al., 2017). Falls management and prevention is evidenced to be more effective when communication and record keeping is improved during the care planning, handover, and the admissions process (Compston et al., 2017).

With the world becoming digital in every way in everyday life, the use of innovative technology is now being used more frequently in Health and Social Care with many organisations and providers going through digital change transformation. Implementing new modern ways of working in care settings are becoming increasingly common, with staff rostering, medication administration and electronic care planning being the three most common systems. Implementing any electronic health system is viewed across the sector as a possible solution to many issues healthcare providers have. Electronic care planning is an investment that providers hope to use to make the services they provide more effective and improve the quality of care for its users. Case studies and testimonials from e-system providers predominantly focus on the positives and how the systems have improved the settings for staff and its service users in relation to medication intake predominantly in hospital settings (Sipanoun et al., 2022; Graber, et al., 2017; Munyisia et al., 2011; Zhang, et al., 2012; Syeda et al., 2009). This identifies a gap in research which specifically discusses electronic care planning or recording systems in residential care settings.

Research Objectives

This study aims to explore the effects of the implementation of an electronic care recording system within the studied care homes, via addressing the following 4 objectives: [1] Identify if there is a change in the total number of notes recorded pre and post-implementation of the e-system; [2] Evaluate the legibility and readability of documentation pre implementation on paper to determine the accuracy of recording; [3] Explore if the newly implemented e-system aids the management of number or falls among residents; [4] Evaluate feedback from staff to understand if there has been any change to the time it takes to record and complete care notes, charts and forms.

Structure of Study

The study began with Section 1 providing an overview and focus to this study. The importance of the research as well as the research aim and objectives were defined. Section two presents a critical review of existing literature in relation to the chosen scope. Section 3 justifies the choice of methods used in the study. Section 4 presents the findings of this study, along with an analysis and further discussion. Section 5 summarises the findings and implications of this research, addresses limitations and provides suggestions for future work.

Literature Review

It is agreed that good record keeping is a basic process, but vital for good quality of care (Pullen and Loudon, 2006). Care Homes and other long-term care providing facilities are under continued pressure to meet the needs of patients while utilising the most efficient practices (CQC, 2020). Paper records can often be out of date, incomplete, illegible, inaccessible and time consuming for staff to regularly update. If used to their full potential, electronic care systems promise to positively impact on these issues (Munyisia et al., 2013). A recent review on health IT systems in residential care suggests that there is currently little evidence that the use of an electronic system has any improvement on the well-being, safety or quality of care received (Bail et al., 2022). To further the existing literature, the authors of this study will attempt to understand with supporting evidence if there is any benefit of the amount of care that is recorded, the time spent on recording and the impact on the quality of care with regards to e-system usage.

Legislation on Health Recording in a Care Setting

Care Homes in the UK are governed by independent regulators, the Care Inspectorate (CI) and the Quality Care Commission (CQC) in England. The CQC and CI inspect and review health and social care services. The care services regulated, both NHS and Private, included are Homes, Hospitals, Dental Services, GP Services, Clinics, Home Care and Community Care. (CQC, 2022; Care Inspectorate, 2022). Each regulator uses scales to assess and rate the quality of a service provider varying from “Inadequate” to “Outstanding” service (CQC, 2022). In September 2020, the CQC published “What good looks like for digital records in adult social care”. The regulator discusses the benefits of digital implementation to include the reduction of errors or dehydration in its users, supporting care planning, promoting paper free environments, and allowing staff to be more efficient. The CQC considered effective use of digital systems should be accessible, accurate, complete with no missing data and person centred.

Amount of Recorded Data via E-Systems

Much of the literature identified for this research discusses EMR (Electronic Medical Records) and its use in a hospital setting. However, there is evidence to show that utilising an electronic system improves accuracy and communication when information is recorded at point of care. One study noted that information could be duplicated or “double charted” after being input in an electronic system. For example, when staff were required to add critical information to the system but also required to keep a note on the service user’s bedside or within the bedroom

(Munyisia, Yu and Hailey, 2011). This is an example of how some providers may be under-utilising an e-system.

Time Spent on Documentation

Businesses that provide electronic care recording continue to promote the benefit that the system is timesaving. Case studies undertaken by providers regularly reported that using a digital platform is “less time consuming” allowing more time for staff to deliver outstanding care instead of completing paperwork (PRSB, 2018; The Access Group, 2019; Person Centred Software, 2020). However, it must be acknowledged that it is unlikely that a care home business or an e-system provider would publish studies or user comments that are derogatory. An observational study undertaken by Munyisia, Yu and Hailey (2011), to measure how time is spent throughout a shift in a nursing home, identified that communication and documentation were the two most time-consuming factors. The benefits of using a computer or handheld device to input service user information is reported as an “easy and quick” way to input, share, store and retrieve data. Any additional time gained back from using an e-system would then allow staff to spend more time with service users giving direct care (Zhang, Yu and Shen, 2012). In the conflicting research for “pro-e-system” it is determined that implementing an electronic system does not give any time back to staff by Hakes and Whittington (2008) and Moore et al. (2023). Their studies reported that EMR made no difference for time management when it came to documentation and a work sampling study found that some aspects of electronic advances added more time required for completion. Equally, studies in 2009 and 2012 found staff were unhappy with the amount of time required to enter the data into a PC or handheld device (Munyisia et al., 2011; Zhang, Yu, and Shen, 2012; Syeda et al., 2009).

Increased Accuracy and Accessibility

Previously discussed is the CQC’s sponsorship of going digital, provided that the information is accurate and contains no errors (CQC, 2022). In 2011, in the early days of providers adopting electronic health systems, a study of long-term care facilities in Texas (USA) interviewed system users to assess their experiences with electronic health records. Researchers found that information was becoming much more accessible. The ease of access led to documentation becoming more accurate which ultimately led to a positive return on investment (Cherry et al., 2011). Using a system in real time allowed information to be read immediately by all staff using devices, it also allowed more information to be displayed on one page or easily navigate between care need or service user with one click (Zhang, Yu and Shen, 2012). Yu, Hailey, and Munyisia’s (2011) highlighted that staff using a paper system found accessing information greater than one month old was difficult and often included poor handwriting, as compared to the home that implemented an e-system and reported increased documentation speed and accessibility. As discovered in an evaluation of point of care digital assistants in a hospital setting, regardless of the action being recorded straight after completion, without the use of portable device it was still “recorded manually and outside of the location” which may lead to “forgetfulness and inaccuracy” (Florea et al., 2020). Care providing facilities are, without a doubt, busy places. Emergencies and untoward incidents, such as falls, can occur daily and without any warning. If providers are now recording at the point of care and a distraction occurs, it is likely that the accuracy and reliability of the records would still supersede when compared to making notes and rewriting at the end of a hard and demanding day (CareDocs.co.uk, 2022; Cherry et al., 2011).

Improving Resident Safety and Increasing Fluid Levels

Falls and any subsequent issues that may follow are a cause for concern in older people. Those living in a care home, as opposed to their own residence, are more likely to suffer a fall. A few contributing factors that may increase a fall include constipation, infections, and dehydration (Care Inspectorate, 2022). Prevention measures such as training and awareness courses for staff, exercises for balance and strength, correct footwear and fall monitoring or recording can be used to support the management of falls (Help the Aged, 2006). The link between dehydration and falls can be made as dehydration may attribute to dizziness or blackouts (NHS Inform, 2021). Research on whether moving to an e-system improves resident safety, specifically falls reduction, is limited, but there has been supporting literature to suggest that an e-system reduced the margin of error by tracking adverse events and improving communication by having data more easily accessible (Bates and Gawande, 2003). Part of the documentation recorded by staff is the recording of fluid intake. When someone is identified to be at risk of dehydration, one step of intervention is to record all fluid drunk (Bunn et al., 2015). A study assessing if there is a link between dehydration and falls identified that a third of all participants who suffered a fall were often found to be dehydrated (Hamrick et al., 2020) and a further study found that fluid was not being accurately recorded due to time management and poor communication (Reid and Allard-Gould, 2004). Electronic care systems come with detailed fluid and hydration recording; a feature that is encouraged to be used for all service users not just those at risk of dehydration. Often the functionality includes not only the tracking of fluid that has been offered or drunk, but many systems have the capability to prompt or remind staff to offer fluid to a service user who is at risk of becoming dehydrated (The Access Group, 2019; Person Centred Software, 2020). It could be reasoned that the use of an e-system does not remove the risk of dehydration from care settings but can act as a warning and preventative measure. A more recent study from Australia in 2021 reviewed literature on the health outcomes that EHR implementation had on residential care. The review found that a positive impact could be for excessive weight loss, malnutrition, and mobility but there was no significant impact on falls (Dendere, Samadbeik, Janda, 2021). Rebecca Meehan (2012) found that the impact on quality of care is one of the positive contributing factors of moving away from paper records after undertaking interviews at a long-term care facility. Although this was not a study for point of care recording, similar benefits of the e-system can be identified on the principle of moving from paper to computer. Taking the view of fluid capturing versus falls in terms of safety, the authors attempt to understand how the accuracy of information and recording at point of care can support the mitigation of the risk of falls and support care teams to closely monitor fluid intake with the failsafe measures build into electronic recording platforms.

Methodology

Through positivist philosophical lens (Ryan, 2018) alongside deductive reasoning (Saunders, Lewis and Thornhill, 2019), this study presents an analysis of the supplied by the care home providers survey and observational quantitative data. Information has been collected across the term of a year (February 2021 – March 2022) across 5 care homes, with a total number of 193 staff members registered for access to the e-system. This included direct care colleagues, management teams and facilities staff (such as housekeeping / domestic, maintenance and catering).

Data Collection and Analysis

The provided data was collected by the project team implementing electronic care planning

and anonymized by the study authors. For each home, the organizational project team have supplied the following documentation:

- Total number of falls per month 3 months pre implementation of the e-system.
- Total number of falls per month 3 months post implementation of the e-system.
- Total number of falls per month 9 months post implementation of the e-system.
- 20% of service user care notes recorded on paper, including additional paper forms and charts, pre implementation.
- 20% of service user care notes recorded on the e-system, including type of care notes, 3 months post implementation.
- 20% of service user care notes recorded on the e-system, including type of care notes, 9 months post implementation.
- Results of a survey issued to staff in the home pre implementation.
- Results of a survey issued to staff in the home post implementation.
- Care notes image samples from each home from paper records.

The survey was issued by the care provider's project team to the staff members involved in the process of e-system transition to obtain an overview of their experiences and behaviours related to care planning within the organisation while using the new technology. The data supplied to the authors for the purpose of this research included 9 questions (Appendix 2) out of the 16 that were asked to each member of staff employed by each care setting in the sample. The data analysed from the survey will support the understanding of the time spent recording data and the impression on the accuracy of the information being recorded. The pre-implementation survey was issued to staff at all levels of each home that would eventually be set up on the system. The organisation participating in this study provided summary level detail from each of the questions. Internal consistency of the Likert scales included in the survey questions was tested using Cronbach's Alpha. The test identified that the score of 0.76 determined the scale to be reliable. At the time of implementation, a total of 193 users were registered on the system across the five care homes. Users added for access to the electronic system included all staff members currently employed the provider. 35 responses were received in total which is a representation of 18% of the total population. For results to be considered as generalised to a population, usually 30 or more respondents would be considered sufficient (Polit and Beck, 2010). After implementation, the post-implementation survey was issued. At this time there were 202 active users on the system across all five care settings. Of 202 staff members, 19 completed the survey which is a representation of 9% of the total population.

Data Analysis

A significant limitation to the primary data is considered that the data was not collected by the authors, therefore some of it was ineligible. Upon receipt from the provider, the original survey data contained a sample size of 20% of the total e-system staff users in each of the 5 care settings. The initial data received from the care home provider was firstly cleansed from incomplete responses deemed ineligible, which brought the sample down to 10%. The authors used descriptive statistical analysis to integrate the data and identify relationships between the data sets to satisfy the objectives of this research. Both the observational and survey data was analysed using Microsoft Excel.

Findings

Objective 1: Amount of Recorded Service User Notes

Paper Records: Before transitioning to an electronic system, each care setting used charts and forms to document and evidence care (personal care, nutrition, cream application) on paper. For each of the 15 service users included in the sample, all forms and documentation for 3 days were supplied for the authors to analyse. To ensure that the data could be compared to the new e-system, each entry on paper was categorised into the same aspects of life that feature on the e-system. An example of this is the care note below, extracted from a daily note entry for Care Home 2, Service User 1 (identified by H2R1). This note includes an entry for the aspects of life: personal care, medical, mobility and communication. Care staff would usually write daily notes, one to three a day, to capture various aspects of life in a few sentences.

11/4/21	was assisted with an personal care, skin intact
07-00	no soap, cream applied, and care given, mobilises
	well, present in mood with good communication, no concerns
	at his present time.

Figure 1: A Note Sample

Electronic Records: After the implementation of the system, all paperwork was archived, and staff immediately changed to recording all care on the e-system using handheld devices. The system allows the care home to schedule critical care for the service user or an ‘ad hoc’ function to record care when necessary. The electronic system categorises care in “aspects of life”. For this study and the electronic software used by the homes, the aspects of life are categorised under the headings: emotional support, activities, medical, nutrition, mobility, sleep, personal care, continence, processes, person safety and communication.

Across all 5 care settings, the average number of notes recorded was 204 per service user after 9 months of using an electronic system which is a 252% increase when compared to paper documentation. There was a minimal difference noted between 3 and 9 months for total notes recorded. Previous research on electronic recording does not quantify the data being any more or less when compared with paper. However, this study identifies that across the 3- and 9-month data, recording at point of care significantly increases the total number of care entries being recorded for each service user from an average of 58 entries on paper to 204 when 9 months post implementation of the e-system. It was noted that the use of electronic system encouraged a greater number of categories of care to be covered that were previously not mentioned on paper forms or charts. The outcome of this analysis addresses the current gap in research on whether an e-system supports the quantity of data that can be captured.

Objective 2: Accuracy of Recording

Real time, point-of-care recording of notes is promoted to allow for information to be added when it has been completed, rather than waiting to record later. This is a benefit promoted towards the accuracy of the information being recorded as discussed in existing literature

(Florea et al., 2020; Cherry et al., 2011). When asked if moving to an electronic system has improved accuracy of notes being recorded, 53% of staff agreed. Throughout the analysis process, the authors identified that care notes written on paper are much harder to understand and can often be illegible due to poor handwriting of staff. Unreadable documentation is susceptible to more inaccurate record keeping.

	Total no. of notes recorded (paper)	Total no. of notes recorded (3 months)	Total no. of notes recorded (9 months)
Mean	58.8	192.3333333	204.0666667
Standard Error	7.829857385	17.95382083	19.26246453
Median	57	190	222
Mode	62	108	#N/A
Standard Deviation	30.32490725	69.53484909	74.60320432
Sample Variance	919.6	4835.095238	5565.638095
Kurtosis	1.198514207	-1.371098868	-0.690874906
Skewness	1.16056319	0.163137302	0.38247916
Range	111	196	249
Minimum	21	106	105
Maximum	132	302	354
Sum	882	2885	3061
Count	15	15	15
Largest(2)	106	295	302
Smallest(2)	31	108	119

Table 1: Total No. of Notes Recorded Pre and Post E-System Implementation

The electronic analysis was much easier and quicker to understand. Previous literature aligns with the findings of this study, as poor handwriting in paper documentation has been discussed in the past (Yu, Hailey, and Munyisia, 2011).

Objective 3: Fluid Recording

With a reference to the previously discussed relationship between the management of fluids in the home and falls due to dehydration (NHS Inform, 2021), this study intended to investigate if fluid recording was altered when recording electronically. The organisation taking part in this study had a policy in place to record fluid for service users who had already been identified “at risk”, or when there was a new admission to understand nutrition habits. When comparing each service user, those who were previously showing 0 entries recorded for fluid moved to having a minimum for 5 entries recorded across the 3 days (an average of 500% increase in records). However, to say that an electronic system improves safety would be misleading. It is presumed that with the significant increase in recording when moving to digital, staff would be able to highlight service users at risk if fluid is being recorded for all services users in the home. Dendere, Samadbeik and Janda (2021) identified that the implementation of a system improved issues with malnutrition. Electronic systems have the capability of identifying if users are at risk for dehydration if fluid has not been recorded. The total number of fluid notes recorded over the 3 days increased by 237 notes when analysed 3 months post-implementation. The occupancy levels for the care home in the sample was supplied for the go live date, 3 months, and 6 months post implementation. As the current occupancy can fluctuate month on month, the average number of falls was analysed as a percentage of the occupancy. Therefore,

the average number of falls per occupancy was calculated. After 9 months of using the electronic system, falls per occupancy dropped across all care settings with an average of 23%. Each home is now recording fluid for each service user. There is however no evidence provided from the organisation to suggest a direct relationship between the increased fluid intake notes and the fall reduction.

Care Setting	Average no. of falls as % of occupancy		
	go live to 3 months	3 months post to 6 months post	6 months post to 9 months post
Care Home 1	26%	33%	22%
Care Home 2	63%	78%	39%
Care Home 3	11%	22%	10%
Care Home 4	9%	27%	3%
Care Home 5	47%	50%	42%

Table 2: Average No. of Falls Recorded Pre and Post E-System Implementation

Objective 4: Time Saving

35% of surveyed staff agreed that it took 1 to 2 hours each day to record residents' notes pre implementation. When asked the same question post implementation, 47% reported that it now takes 30 minutes to 1 hour using the electronic system (Figure 2). To visualise the results of the Likert scale questions, the results were charted into a stacked diverging bar graph, centralising the neutral responses (Heiberger and Robbins, 2014). The implementation of an electronic system received mostly positive results. A larger negative response was noted when asked if since moving to digital there has been a greater allowance to spend more time with residents (Figure 3).



Figure 2: Time Spent Recording Care Notes Pre and Post E-System Implementation

53% of staff members agreed that an e-system improved accuracy of daily notes and that it improved the overall safety of service users. 67% of staff members agreed that an e-system allowed them to record daily notes and care interactions quicker. 33% agreed that an e-system allowed them to spend more time with service users. 87% feel it took less than 1 hour to record care for service users using the system.

When asked how often staff could engage in meaningful activity with service users, 17% of staff stated that there was no opportunity for meaningful activity during their shift. Meaningful activity is described as “physical, social and leisure activities that are tailored to the person's needs and preferences” (NICE, 2013).

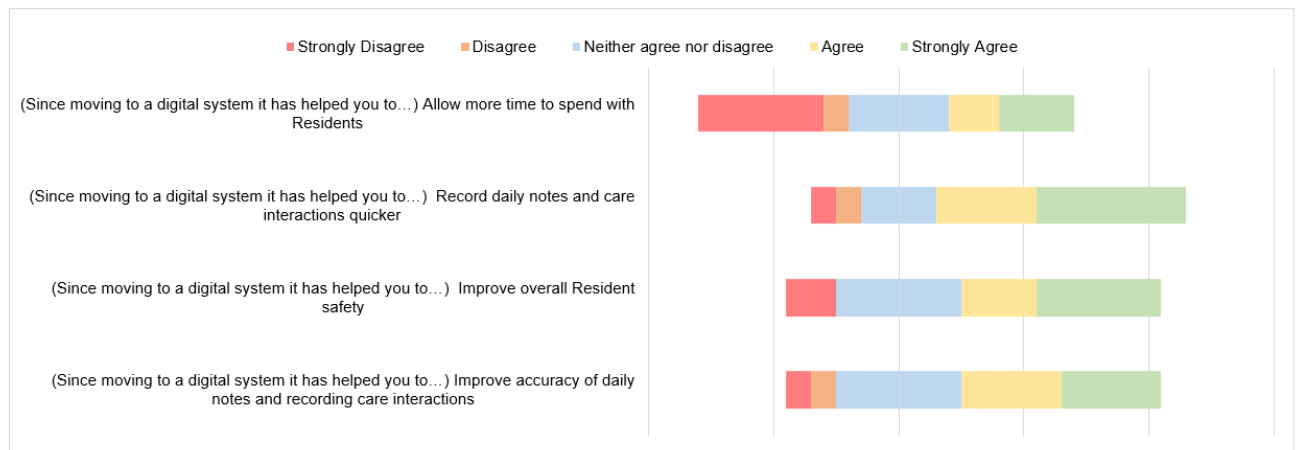


Figure 3: Stacked Diverging Bar Graph

Previously it was discussed that businesses who provide electronic care recording promote the time saving benefits to deliver better care with less paperwork (PRSB, 2018; The Access Group, 2019; Person Centred Software, 2020). When asked about engaging in meaningful activity since implementing an electronic system, an insignificant increase was noted and 20% now reported that there is no opportunity for meaningful activity with service users. Findings of this research align with the themes from previous studies where the input of service user information was easier and quicker on a handheld device but the homes taking part in this study disagree that the extra time is being spent engaging with residents of the home (Munyisia et al., 2011; Zhang, Yu and Shen, 2012; Syeda et al., 2009).

Conclusion

Across all care homes comprising the sample, each showed a significant increase in the total number of notes being recorded. The relationship between the use of point of care recording and an increase in the number of notes that can be captured by staff has seen a significant difference when compared to the homes using paper record keeping. There was no comment made by staff around the satisfaction from using the devices to record care. The correlation between service users being dehydrated and the management of fluid recorded was proven more effective when using the electronic system. The total number of fluid notes recorded over the 3 days increased by 237 when analysed 3 months post implementation. Each home is now recording fluid for each service user which now means homes can monitor each service user and allow the system to mitigate any risk associated with the lack of fluid being offered. As part of this study, the authors set out to identify any patterns relating to the number of falls occurring in each care setting. There is no evidence provided from this research that there has been movement in the number of falls because of the use of a digital system. The average

number of falls per quarter varied home to home with no recognised pattern month on month from the increased monitoring of fluid.

Recommendations

From this research and the data used in analysis, the improvement of the care setting was more prevalent in the data being captured and how much data was being recorded. For care settings or providers, where the goal is to increase the quantity of information being captured for each service user, implementing an electronic system can exceedingly support this, as identified in this research. If the goal of moving to digital is to improve safety, from this research alone there is not enough evidence to suggest that this is something an e-system can impact. However, from a nutritional perspective, an electronic care recording system can help a care home to manage and monitor intake.

Limitations and Future Work

This data could be used to represent care settings with multiple communities where maximum occupancy is less than 35. Having contributed to the limited academic research in this area, this study is also of value for care home settings management exploring the possibility of using electronic care recording systems as it enables them to make better-informed decisions on similar e-health roll outs. It is practical for stakeholders looking to understand the benefits of the investment and may also be helpful for those developing digital software so that they can investigate improvement or changes. The study authors looked to review if there was possibility for accuracy of documentation to increase when moving to an e-system, but direct legibility comparison was not made between care notes. For future researchers, there is scope to sample handwritten notes from service users in the care setting to compare directly with how they appear on a digital platform. Doing so will allow them to assess that if notes are more legible and clearer.

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Appendices

1. Appendix 1: Survey Questions

Question ID	Survey	Question	Type	Choices
Pr1.2	Pre-Implementation	Name of Home	Free Text	N/A
Pr1.3	Pre-Implementation	What is your current role within "provider name"?	Free Text	
Pr3.3	Pre-Implementation	Improve accuracy of daily notes and recording care interactions	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Pr3.5	Pre-Implementation	Improve overall Resident safety	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Pr3.10	Pre-Implementation	Record daily notes and care interactions quicker	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Pr3.11	Pre-Implementation	Allow more time to spend with Residents	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Pr4.1	Pre-Implementation	How long do you currently spend recording Care? (Daily notes, personal care forms, charts etc)	Ranking	30 minutes or less, 30 minutes to 1 hour, 1 to 2 hours, 2+ hours
Pr4.2	Pre-Implementation	How often do you spend time supporting Resident with meaningful Activity on each shift? (not direct care, such as Personal Care, Meal Times etc)	Sliding	None, 1-2 times a day, 3-4 times a day, 5+ times a day
Pr4.7	Pre-Implementation	How often do you stay past your shift to record care notes, filling charts, etc?	Ranking	Never, Sometimes, Often, Always
Po1.2	Post-Implementation	Name of Home	Free Text	N/A
Po1.3	Post-Implementation	What is your current role within "provider name"?	Free Text	
Po3.3	Post-Implementation	Improve accuracy of daily notes and recording care interactions	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Po3.5	Post-Implementation	Improve overall Resident safety	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Po3.10	Post-Implementation	Record daily notes and care interactions quicker	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Po3.11	Post-Implementation	Allow more time to spend with Residents	Sliding	(Strongly Disagree) 1, 2, 3, 4, 5 (Strongly Agree)
Po4.1	Post-Implementation	Since moving to an electronic system, how long do you currently spend recording Care? (Daily notes, personal care forms, charts etc)	Ranking	30 minutes or less, 30 minutes to 1 hour, 1 to 2 hours, 2+ hours
Po4.2	Pre-Implementation	How often do you spend time supporting Resident with meaningful Activity on each shift? (not direct care, such as Personal Care, Meal Times etc)	Sliding	None, 1-2 times a day, 3-4 times a day, 5+ times a day
Po4.7	Post-Implementation	Since moving to an electronic system, How often do you stay past your shift to record care notes, filling charts, etc?	Ranking	Never, Sometimes, Often, Always