Nurse Researcher

Methodological challenges of hydration research in UK care home settings

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Abstract:	Background: The evidence base for hydration practice in care homes is underdeveloped. While there is a need for high-quality research to determine what practices support older people living with dementia to drink sufficient fluid there is also a need for methodological development to address this. Aim: This paper highlights the methodological issues that were encountered during a feasibility cluster randomised controlled trial of Think Drink, a practice guide for hydration care for those living with dementia in UK care homes. Discussion: This is a challenging area due to the complexity of recruitment, participation, and data collection within care home settings. This necessitates that extra attention is paid to issues of rigour and quality in research design. As multiple challenges may be apparent, a variety of strategies are required to overcome them. Conclusion: Despite these challenges, it is important that researchers continue to reflect on rigorous approaches in order to develop evidence in a crucial area of care. Implications for practice: Researchers working in complex environments (such as care homes) face a variety of challenges to complete methodologically rigorous research. This paper highlights the importance of being critical of both research processes and data to mitigate and overcome the importance of this.
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Additional Information:	
Question	**Response**
Have all named authors contributed to the article and reviewed and approved its content before submission?	Yes
Please confirm that you have read and agree to our Publisher's Agreement that is available here	Yes
Have you been asked by RCNi to write this article?	No
Have you submitted this manuscript elsewhere?	No
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Do you have copyright for all the images, graphics and figures included with your submission?	Yes
What is the word count of your article	4780

including the abstract, body text, boxes, tables and figures, and references?	
Author Comments:	Dear Ms Sylvester We wish to resubmit our research article following review / recisions. It is entitled Methodological challenges of hydration research in UK care home settings. We confirm that the submitted work is original, and has not been published elsewhere. It is not under review for publication elsewhere. In this paper reflects on the methodological, data and ethical issues of conducting research with residents in UK care homes. It draws from experience of conducting a feasibility study on a hydration intervention for residents with dementia. It draws from the literature not only informing work in this setting, but also challenges to critical use of data in broader research approaches. The article does not attempt to problematize research in this area, which is of key importance in the care of older residents in care home settings. Instead, it aims to identify key challenges from experience, and highlight the approaches and strategies used to mitigate them and conduct high-quality research in a challenging environment. Although these reflections will be of clear relevance to others studying in this area, we believe they may also benefit all researchers who are attempting to complete projects in challenging environments and with participants who may not be able to engage with more commonly-used research methods. We have no conflicts of interest to disclose. Please address all of your correspondence concerning this manuscript to me at philip2.hodgson@northumbria.ac.uk Thank you very much for your consideration of this manuscript.

Methodological challenges of hydration research in UK care home settings

Abstract

Background: The evidence base for hydration practice in care homes is underdeveloped. While there is a need for high-quality research to determine what practices support older people living with dementia to drink sufficient fluid there is also a need for methodological development to address this.

Aim: This paper highlights the methodological issues that were encountered during a feasibility cluster randomised controlled trial of Think Drink, a practice guide for hydration care for those living with dementia in UK care homes.

Discussion: This is a challenging area due to the complexity of recruitment, participation, and data collection within care home settings. This necessitates that extra attention is paid to issues of rigour and quality in research design. As multiple challenges may be apparent, a variety of strategies are required to overcome them.

Conclusion: Despite these challenges, it is important that researchers continue to reflect on rigorous approaches in order to develop evidence in a crucial area of care.

Implications for practice: Researchers working in complex environments (such as care homes) face a variety of challenges to complete methodologically rigorous research. This paper highlights the importance of being critical of both research processes and data to mitigate and overcome the importance of this.

Introduction

While there has been much focus on the principles of quality and rigour of methodologies and methods, less discussion has explored the difficulties of maintaining these standards while completing research in challenging environments. Research within care homes which has been identified elsewhere as posing multiple challenges, particularly relating to recruitment, consent, and reliability of measures (Lam et al., 2018). This paper examines issues from a feasibility cluster randomised controlled trial (RCT) of a hydration intervention for care home residents living with dementia to assist researchers to evaluate their approach to implementing rigorous and appropriate methods.

Background

Care home residents living with dementia have been shown to be at high risk of dehydration (Bunn et al., 2015), due to a range of factors which negatively impact drinking behaviours. These include clinical factors such as health concerns, functional factors impacting the ability to drink, and mental factors such as recognising drinks and agitation (Masot et al., 2018). This can create significant challenges for the carers who support them, and result in dehydration-related admissions to hospital.

Suboptimal hydration and dehydration have been found to multiple negative impacts for older people, particularly on cognition (Pross, 2017). A recent systematic review into the effects of dehydration on older people found evidence of considerable exacerbation of health concerns, such as those related to frailty, and stressed the impact of this on mortality, course of illness and admission to hospital (Edmonds et al., 2021). It is therefore important that residents in care homes are well supported to drink by staff trained in hydration care (Bunn et al., 2019).

Bunn et al's (2015) systematic review of hydration interventions in long-term care suggested a trend toward increasing fluid intake via multi-component interventions. As residents living with dementia often have many coexisting health, sensory, and functional problems, it is unlikely that a single intervention would be effective. This study sought to address this issue through the development and assessment of the ThinkDrink guide; a multi-component hydration intervention for care home residents living with dementia. The guide itself was made up of strategies and approaches to enhance four core elements of hydration practice, namely hydration support (regular / increased fluid offers and strategies for encouragement), drinking activities (hydration as regular care and hydration as activities), drinking-conducive environments (both physical and social) and drinking equipment (vessels and aids). A feasibility study was undertaken to establish acceptability to the target population and relevant organisations of conducting a definitive RCT to evaluate the effectiveness of this hydration intervention compared to usual care (Cook et al., 2019).

While methodological challenges occur within any study, this can be particularly true in care home research. Lam et al.'s (2018) systematic review assessed the challenges of conducting research in long-term care facilities. These included issues related to owners (e.g. changes of ownership), residents (e.g. high levels of heterogeneity), staff (e.g. high turnover), family (e.g. seeing research as an intrusion of privacy), ethics (e.g. obtaining consent), and methodology (e.g. achieving randomisation). It is notable that while some of these may be found elsewhere in ageing research, such as increased levels of cognitive decline (Perfect et al., 2021), others are tied specifically to the care home environment. These challenges can also encompass the whole research process, from recruitment, approval (Collingridge-Moore et al., 2019) and liaising with stakeholders such as GPs (Shepherd et al., 2015) to the ability to conduct meaningful qualitative data collection (Hall et al., 2009).

Whilst issues such as these are discussed in general research literature, using the care home context as an illustration highlights a range of challenges in an applied setting. The feasibility study examined here was forced to address many of these problems and posed questions for future research even amongst a team experienced in working in such settings. This paper therefore uses care home research to highlight specific issues in this context and also identify strategies for critical approaches to research methodology and methods in general.

Methods

Following the development of the ThinkDrink practice guide, a feasibility cluster randomised controlled trial was completed. The guide was implemented in six care homes for a three-month period, with a four-week follow up, with a similar data collection approach taken in five control care homes. All sites were based in northeast England and randomised to ensure a range of provision (nursing, residential, and dementia care), ownership (single proprietor or company), and capacity.

A range of resident outcome measures were assessed (see Table 1). Data were collected at two time points: baseline and three months post-intervention. A total of 87 residents were included in the study (37 participated in the control group and 50 in the intervention group).

Table 1. Resident outcome measures and staff interview topics

Resident Outcome Measure	Staff Interview Topics
• Change in the proportion of residents who met the recommended daily fluid intake • Hospital admissions due to dehydration • Number of falls • Laxative use • Urinary Tract Infections • Upper Respiratory Tract Infections	• Acceptability of the ThinkDrink guide • Barriers and facilitators • Relevance of the ThinkDrink guide to delivering care • Observed outcomes on residents • Hydration practices adopted because of ThinkDrink

The collection of resident outcome measures, defined by the research team to explore an overview of levels of hydration within the feasibility study, was supported by qualitative interviews with care home staff. Overall, 45 staff from intervention homes participated in 9 individual and 17 small group interviews to assess the feasibility of the intervention (see table 2 for breakdown of staff roles). A mixture of individual and group interviews were carried out for pragmatic reasons, with staff attending during breaks or quieter periods in their shifts. However, this offered the benefits of allowing some participants the ability to explore practice individually, while others could draw from more shared experience with colleagues. Resident interviews were not carried out due to the communication difficulties that may occur within this population and staff being best placed to address organisational issues such, as acceptability. Qualitative interviews were audio recorded, transcribed, and thematically analysed (Braun and Clark, 2006) to identify and develop final themes. To ensure anonymity and confidentiality, interviews took place in private areas of the homes and all identifiable information was removed during the transcribing process.

Table 2. Staff Roles

Role	Number	Gender	Time in current home (range)	Experience in care home (range)
Manager	3	3= F	1 year – 10 years	9 years – 12 years
Deputy manager	1	1 = F	2 years	14 years
Nurse	3	2 = F	0.66 years– 4 years	2 years – 10 years
Senior + Care assistant	23	20 = F	6 months – 24 years	none - 24 years
Student nurse	2	2 = F	0.02 years	none
Activities coordinator	3	3 = F	5 years– 11 years	none – 6.5 years
Domestic	4	4 = F	1.5 years– 11 years	none – 20 years
Catering	6	5 = F	0.5 years – 18 years	none – 24 years

Ethical approval for the study was secured from Northumbria University and the NHS Health Research Authority. However, a key ethical consideration surrounded researching with residents who potentially lacked the ability to consent (e.g. people living with dementia). Therefore, Section 32 of the Mental Capacity Act 2005 applied in this situation. Those residents that had capacity to understand what participation involved were asked to give informed consent for participation. However, many residents were unable to recall or understand this information. Their consultee (family member or informal carer) was therefore asked to indicate to the best of their knowledge whether the resident would have wanted to consent if they had the capacity to.

Methodological challenges

Randomisation

Care homes were the unit of randomisation, rather than intervention allocation at the resident level. Whilst blinded assessments were carried out, the intervention itself was not blinded, as although resident data could be collected from home systems without an overt focus of staff on hydration, staff in the intervention homes were immediately aware they were taking part in hydration-related training. It is acknowledged that participant awareness of an intervention can significantly impact outcomes within clinical trials (Hróbjartsson et al., 2014), however in this case blinding was limited as the differences between the intervention group and control group were too great to go unnoticed.

Contamination was possible if care home staff learned of hydration practices from other homes that were participating in the intervention arm of the study. This was reduced by requesting the control care home staff to maintain standard hydration practice and, following completion of data collection, all materials and training were made available to control homes.

Ethical issues and recruitment

Participants recruited for the intervention arm of the study received hydration care from staff who had taken part in ThinkDrink education and received ongoing support to use diverse hydration practices. Those in the control arm received usual hydration care provided by the care home team in the setting where they lived. The justification for the study, aligned with the ethical concept of beneficence, was the need to reduce hospital admissions, improve hydration practice and develop rigorous evidence outweighed concerns over delayed access to the intervention. This principle was also extended to include the justification for completing research with people who lack capacity to consent with the purpose of generating evidence that would inform interventions to improve quality of care.

When seeking ethical approval to undertake this study, one challenge was ensuring that staff and residents/consultees had the opportunity to decline to participate. Although there is debate about sample size for pilot and feasibility studies, an overall size of 30 is often accepted as appropriate (Lancaster, Dodd and Williamson, 2004). However, due to the nature of the study population, particularly the likelihood of residents being in later life, it was felt necessary to over- to ensure that a full-scale trial would not be underpowered. Dependent on local management arrangements of the care home, residents were recruited from one area/floor of the care home to provide an opportunity for staff and residents not wanting to participate in the study to decline to do so.

Consequently, there were varying levels of engagement in each participating home, across staff, residents and their consultees. Although this created a challenge in estimating and maintaining

levels of recruitment this variation should be seen as inevitable and acknowledged. However, recruitment materials that stressed the importance of the study and the significance of its impacts on care were seen as encouraging for all participants.

Recruitment

Recruitment proved to be lengthy and complex, and there were delays in introducing the ThinkDrink intervention into some settings. This contributed to a situation where it was not possible to complete data collection over a 6-month period in some sites. The identification and recruitment of potential sites and residents within each home caused delays and concerns over the representativeness of the participating homes.

Although most homes do not have specific procedures in place for participating in research, they were favourable when approached as they all acknowledged that hydration was an ongoing concern in their organisations. Recruitment of sites was time-consuming - it was difficult to secure appointments with management staff who were busy and had competing priorities. Multiple phone calls and appointments were required, even when participation had been agreed in principle with managers. Issues such as a bout of illness or the death of a resident meant that recruitment procedures had to be suspended indefinitely before a new date could be identified. Participant recruitment, particularly via consultees, was also a barrier in terms of time. Consultees were often family members who would not be in the homes during set times, or at all, making it difficult for the research team to schedule face-to-face meetings to discuss participation. Such problems remained ongoing concerns throughout the project, and future research in this area should ensure that it allows for significant resources, both in terms of time and staffing, to address this.

Data protection legislation meant that the research team were unable to contact residents' family members directly, without first having permission to access contact details confirmed by the care home staff. This meant that recruitment was delayed as the homes acted as gatekeepers for consultee details. Even once this process had been completed, as residents' family members often live outside of the region, subsequent contact took the form of telephone and email conversation, which further complicated consent procedures.

Attrition

There was substantial attrition of study sites during the recruitment phase prior to data collection commencing. For example, one home agreed to participate as an intervention site, but an electronic care planning system was introduced and the manager withdrew when the workload associated with this became evident. In another home, there was a change of manager and their replacement required an induction period. Such situations required recruitment of further sites, necessitating additional workload. However, one measure of acceptability of ThinkDrink was loss to follow up rates from the study, and no recruited homes withdrew following implementation.

Following discussion with home managers, it was highlighted that a six-month data collection period may be inappropriate for this study due to the expectation of high levels of participant attrition. As discussed, this study focused on a population experiencing high levels of frailty, meaning that mortality/functional decline in relation to hydration could be experienced during this period. Therefore, data collection was shortened to a three-month period. However, even within this, attrition was experienced, with seven participants (8%) passing away during the data collection window. Additionally, one resident moved to a different home, and another withdrew their consent

due to increasing levels of physical decline. High levels of attrition are therefore expected within this population in future studies, particularly if data collection periods are extended.

As such, as part of the a prior power calculation for this study, an additional 10-15% was included to mitigate attrition issues.

Quality of data

An audit of hydration care plans in both control and intervention homes was undertaken. No significant differences between the information in care plan provision were found at baseline. However, this information did reveal interesting trends. Only 12% of care plans contained specific hydration care plans. Where hydration information was found, it often related to functional issues such as assessment of capability to drink (72%) and assessment of physical problems in drinking (88%). However, except for resident preferences being identified (75%), any cognitive or personal issues were underreported. Issues such as assessment of daily drinking pattern (8%), assessment of cognitive problems in drinking (22%) and assessment of prompts to encourage drinking (15%) were all addressed in less than 30% of care plans. Only 3% of care plans included a management plan for when drinking was reduced or refused. As such, it was apparent that care plan provision for hydration was focused largely on a functional/physical paradigm, while potential challenges related to cognition and personal support were often ignored.

Robustness of data collection

The robustness of data collected and included within the study was also identified as a significant challenge. As set out in the original protocol, this study would rely heavily on routine data collected in the home itself (e.g. fluid balances, number of falls, etc.). However, the team noted variation in the quality of the data. Although there was evidence of this impacting all elements of data collection (anecdotal reporting of issues such as falls and UTIs in the data returns by staff members), it was particularly evident in the collection of fluid balance totals.

It was noted during the training element of the intervention that accurate recording of fluids was a concern for many staff. For example, usual practice was for staff to record what had been offered rather than what had been drunk, notably resulting in frequent use of multiples of twenty on fluid balance charts (e.g. 200mls recorded for the offer of every drink). As the importance of accurate recording was stressed during the training, intervention homes provided more detailed information at follow-up data collection, evidenced by totals such as 115mls or 85mls for partially consumed beverages. One home reported the use of medicine pots to measure the dregs from vessels to create an accurate record. Whilst showing increased accuracy, this resulted in lower totals being collected across the intervention group, whereas the use of large units remained prevalent in control homes.

This issues therefore had the potential to negatively impact the accuracy and comparability of data at collection points. Whilst very little change was observed in the intervention care homes at follow-up, it is possible that residents were drinking more, yet the improved accuracy in recording did not highlight this change. This, in turn, had impact on the findings of the study, and the development of any subsequent RCT.

Several concerns remain surrounding the accuracy of the data collected in this study, and future work should consider the use of staff external to the homes for data collection to ensure accuracy.

However, if unfamiliar research staff are present in care homes that provide services for people living with dementia, this could be disruptive and distressing for residents (Fleming et al., 2017). Based on this, research methodology adopted in future research should enable researchers to participate in care whilst undertaking data collection. This will impact significantly the funding required to undertake similar research.

Seasonal impact

Although concerns existed about the standard of data collection, another extraneous variable which can be seen influencing participant outcomes was the timing of data collection. Due to issues of recruitment, homes were recruited at baseline during the summer months of 2018, before having follow-up data collection in the autumn and winter of 2018-2019. This meant that the possibility of natural variation in the data collected was strong, particularly as staff reported an increased emphasis on hydration when temperatures were higher. This factor potentially influenced practice at both data collection points, which means it should be given greater consideration in future work on the subject. However, only one staff participant attributed changes to fluid consumption to the weather, while all others related it to the impact of the intervention. Such differences between time points of data collection should be explored in future research.

Similarly, one home attributed a noted potential increase in chest infections to the winter period. This is interesting considering that there was a decrease in upper respiratory infections in the intervention homes. One suggestion could be that this occurred following data collection and is therefore not represented in the analysis. Alternatively, this could again suggest methodological issues underlying data collection.

Qualitative data collection

The rigorous use of qualitative interviews was also challenging in the care homes. Emphasis from the research team was placed on being flexible to ensure interviews were not inconvenient for staff, and participation was offered to staff on a rolling basis during breaks in the home. However, while this facilitated data collection, it still resulted in additional demands on participating staff's limited time. Therefore, interviews were often short in duration, with a mean time of 17:08 minutes, although this was longer for managers who were more able to prioritise research. Although private spaces were sought, these were sometimes not entirely secluded, meaning staff could be distracted by the activities going on elsewhere. As the staff member's priority was rightly resident care, several interviews were begun, paused and then completed later. These issues challenged the amount of data collected, and its quality, as less time was available to build rapport, probe finer points of detail or address issues of reflexivity, such as the power imbalance between research staff providing training and care staff in receipt of it.

Discussion

This paper adds to the sparse literature concerning governance (Reed, Cook and Cook, 2004) and methodological challenges of studying a particular condition or practice in care homes, such as falls, delirium and incontinence (Eeles, Rockwood., 2008; Kehinde et al.2011; Lam et al., 2018; Law and Ashworth, 2022). In the case of hydration care it is important that residents and all care home staff and professionals working in care homes are engaged in research to ensure that their perspectives are understood. However, demands of resident care and staffing levels contribute to challenges in releasing staff to participate in data collection. Researchers should be cognisant of these issues and explore options to optimise participation, such as out-of-hours interviews with renumeration.

Another key issue is quality when relying on data collected during daily routines, such as fluid intake records and care plans. Analysis of the practice data within this study highlighted flaws in relation to accuracy and completeness. Analysis of such data could potentially result in misleading findings. However, data collected only by researchers may be impractical and obtrusive in the context of a care home because researchers could not be present during every instance when residents were offered drinks, particularly for residents whose primary aim is to enjoy their life in their home. The use of multiple or mixed methods that allow triangulation and synthesis of findings, or approaches that allow further critical exploration of data and its construction (Moffat et al. 2006), may address some of these issues. The important point is that researchers need to be highly critical of the quality of data they seek to collect, and the feasibility of implementing robust data collection methods. It is therefore noticeable here that this project did not use periods of structured reflection within its study design and, potentially as a result of this, only identified such problems as they were occurring and not in a pre-emptive manner.

Collingridge-Moore et al. (2019) argue that the methodological challenges of conducting research in a care home environment have led to a systemic exclusion of people living in care homes from research. This view is endorsed in Law et al.'s (2021) observation that as few as 7% of care homes in Scotland were involved in research in 2014. Indeed, care homes were inaccessible to researchers during the Covid-19 pandemic and there is little evidence that engagement in research has improved in recent years in this sector. Older residents who are living with dementia are at high risk of suboptimal hydration and dehydration that can contribute to decreased quality of life, morbidity and mortality. Hydration care for this segment of the population is a complex activity and the lack of strong evidence of what works well in what circumstance does little to ensure that they are supported to ingest sufficient fluid every day. Hence, there remains an ethical imperative to undertake hydration research in care homes, despite challenges.

Conclusion

This novel paper included reflections on utilising research methods to collect data in care homes. These reflections will be useful to researchers both conducting research in this context, and also looking to ensure levels of quality and rigour throughout research.

It suggests the need for researchers to be aware of, and challenge, approaches to recruitment, data collection, data analysis, ethics, and project management within the specific contexts of their research. Without these reflections, it is possible that data can be misinterpreted and future research designed in a manner which is inappropriate for both the setting and population.

It is important to note, that these difficulties should not be interpreted as a deterrent for working in these areas. Although challenging, the importance of studying this topic, and working with this population, make it essential for researchers to continue to adapt their practice to ensure this vital understanding is developed.

Also, outside the focus of this study, this discussion reinforces the need for researchers to constantly challenge and be aware of the strengths and limitations of their methodological approaches. This questioning of research and its design is imperative in ensuring that important questions are answered, regardless of the challenges different methodological approaches can bring.

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Many thanks for your comments in relation to the attached paper. For ease of revision, I'm including a table of comments and how they were addressed.

Thank you again for your feedback.

Reviewer 1 comments	
Implications: There is not clear… rephrase please	Altered to now read: *"Researchers working in complex environments (such as care homes) face a variety of challenges to complete methodologically rigorous research. This paper highlights the importance of being critical of both research processes and data to mitigate and overcome the importance of this."*
Background: some very dated information…need to relook at this and see if there is any newer literature available. Also provide information on what staff currently do to support residents to remain hydrated (aside from the Think Drink research).	The Background section has now been updated.
To reflect a more person centred philosophy, consider writing 'people living with dementia'	The term *"living with dementia"* is now used throughout.
Describe 'ThinkDrink' guide in more depth, for example outline what are the multi-components of the hydration intervention for care home residents with dementia.	A statement added: *"The guide itself was made up of strategies and approaches to enhance four core elements of hydration practice, namely hydration support and encouragement (regular / increased fluid offers and strategies for encouragement), drinking activities (hydration is regular care and hydration as activities), drinking conducive environments (both physical and social) and drinking equipment (vessels and aids)."*
Re the acceptability of the study, explain who this is to be acceptable to.	Altered to read: *"A feasibility study was undertaken to establish the acceptability to the target population and relevant organisations of conducting a definitive RCT to evaluate the effectiveness of this hydration intervention compared to usual care (Cook et al., 2019)."*
Overall, I think some proof reading and editing would benefit this paper, the points being made are not always clear and it can be difficult to follow. For example: Authors state "However, while methodological issues and challenges within methods are paramount within any study, difficulties completing research in care homes are particularly significant." This is not clear, relook	Altered to read: *"However, while methodological challenges occur within any study, this can be particularly true in care home research."* Altered to read: *"These included issues related to owners (e.g. reluctance to participate and changes of*

at this this and rephrase Example There is something missing from this sentence "These included related to owners ….	*ownership), residents (e.g. inability to consent and high levels of heterogeneity), staff (e.g. high turnover and time constraints), family (e.g. seeing research as an intrusion of privacy), ethics (e.g. obtaining consent), and methodology (e.g. achieving randomisation and representativeness).”*
Re table 1: Resident outcome measures and staff interview topic, how were the outcome measures decided and by whom?	A statement added: *“The collection of resident outcome measures, defined by the research team to explore an overview of levels of hydration within the feasibility study, was supported by qualitative interviews with care home staff.”*
Explain why the residents were not interviewed	A statement added: *“Resident interviews were not carried out do to the communication difficulties that may occur within this population group and staff being best placed to address organisational issues such as acceptability and barriers and facilitators.”*
Include the topic guide for the care staff	Thank you for this suggestion. As the full topic guide is approximately 500 words in length, and would represent 10% of the overall paper’s word count, an overview of the topic guide has been given in the table. If the full guide is required, could this be added as supplementary material?
Explain why there was a mixture of individual and group interviews and how the different interview types had an effect on the participants.	A statement added: *“A mixture of individual group interviews were carried out for pragmatic reasons, with staff attending during breaks or quieter periods in their shifts. However, this offered the benefits of allowing some participants the ability to explore practice individually, while others could draw from more shared experience and reflections with colleagues.”*
Explain what you mean by a consultee.	Altered to read: *“Their consultee (family member or informal carer) was therefore asked to indicate to the best of their knowledge whether the resident would have wanted to participate if they had the capacity to give consent.”*

" It was also argued that the greater good is served by completing research with people who lack capacity to consent with the purpose of generating evidence that would inform interventions to improve health and quality of care." … explain the greater good comment … greater good for whom? ..not clear	The phrasing was intended to build on discussion of the concept of beneficence in the previous sentence. It has now been altered to read: *"This principle was also extended to include the justification for completing research with people who lack capacity to consent with the purpose of generating evidence that would inform interventions to improve health and quality of care."*
"However, one measure of acceptability of ThinkDrink was drop-out rates from the study" what does this mean?	Now termed *"loss to follow up"*.
Robustness of data collection "A significant issue related to the robustness of data collected and included within the study", this is an incomplete sentence	Altered to read: "The robustness of data collected and included within the study was also identified as a significant challenge."
Qualitative data collection: how was anonymity and confidentiality maintained ?	A statement added: *"To ensure anonymity and confidential were maintained, interviews took place in private areas of the homes and all identifiable information was removed during the transcribing process."*
The authors mention and refer to reflection (quite a lot) and reflexivity but it is unclear in what sense these are mentioned as there is no evidence of structured reflection and it is unclear whether there was supposed to be or not	Thank you for this very interesting point as it was not something we had considered. The project did not use structured reflection in this way, and this may have resulted in many of these issues only being addressed when they were noticed, rather than pre-emptively. This point has been added to the discussion. *"It is therefore particularly noticeable here that this project did not use periods of structured reflection within its study design and, potentially as a result of this, only identified such problems as they were occurring and not in a pre-emptive manner."*
Reviewer 2 comments	
1. ABSTRACT: Could the implications for practice "Developing research overcomes methodological challenges when conducting research in complex environments / topics" be rephrased for clarity? It is unclear what point is being made. Could the	Altered to now read: *"Researchers working in complex environments (such as care homes) face a variety of challenges to complete methodologically rigorous research. This paper highlights the importance of being critical of both research processes and data to mitigate and overcome the importance of this."*

relevance to nursing research also be made more explicit?	
BACKGROUND, line 5, "result in dehydration-related admissions to hospital by this vulnerable population" The use of the word vulnerable is not in keeping with positive language or person-centred language for people living with dementia, please consider rephrasing or removing this adjective. See recommended positive language guidelines: Positive language guide_0.pdf (alzheimers.org.uk)	The word vulnerable has now been removed throughout.
BACKGROUND, line 20, "the ThinkDrink guide" as this is such as key part of this study, is it possible to include more information about ThinkDrink, perhaps with supplementary material, a reference that links to further reading or a greater explanation of ThinkDrink in the main body of this article?	A statement added: *"The guide itself was made up of strategies and approaches to enhance four core elements of hydration practice, namely hydration support and encouragement (regular / increased fluid offers and strategies for encouragement), drinking activities (hydration is regular care and hydration as activities), drinking conducive environments (both physical and social) and drinking equipment (vessels and aids)."*
BACKGROUND, line 22, "acceptability of conducting a definitive RCT" Is the editor happy with use of abbreviations?	This has now been altered to read *"randomised controlled trial (RCT)"* in the first instance.
BACKGROUND, line 26-27, "These included related to owners (e.g. reluctance to participate and changes of ownership)" Can this sentence be edited for clarity as it is unclear what point is being made	Altered to read: *"These included issues related to owners (e.g. reluctance to participate and changes of ownership), residents (e.g. inability to consent and high levels of heterogeneity), staff (e.g. high turnover and time constraints), family (e.g. seeing research as an intrusion of privacy), ethics (e.g. obtaining consent), and methodology (e.g. achieving randomisation and representativeness)."*
BACKGROUND, line 40-42, "The discussion here illustrates these approaches both to reflect on care home research specifically and identify strategies for critical approaches to research methodology and methods in general." Could this sentence be edited? The use of "discussion here" feels repetitive from the previous sentence where you say "discussed	Altered to read: *"The feasibility study examined here was forced to address many of these issues and posed questions for future research even amongst a team experienced in working in such settings. This paper illustrates these approaches to both reflect on care home research specifically and identify*

here", but I think it general this sentence could be rephrased for clarity.	*strategies for critical approaches to research methodology and methods in general."*
METHODS, line 3, "6 care homes for a 3-month period, with a 4-week" Is the editor happy with use of figures rather than numbers for numbers ten and under?	These have been altered.
METHODS, line 15 "The collection of resident outcome measures was supported by qualitative interviews" I think "was" should be "were"	I've left this as was, as in *"the collection was",* but happy to alter if I'm incorrect.
METHODS, line 23-27, "Therefore, the Mental Capacity Act 2005 applied in this situation" The use of a Consultee relates to Section 32 of the Mental Capacity Act (2005), so it may be worth adding in that detail	This has been added.
METHODOLOGICAL CHALLENGES, RANDOMISATION, line 2-3 "Whilst blinded assessments were carried out, the intervention itself was not blinded" This is an interesting point, can an explanation of how the assessments were blinded but the intervention not blinded be expanded?	Altered to read: *"Whilst blinded assessments were carried out, the intervention itself was not blinded, as although resident data could be collected from home systems without an overt focus of staff on hydration care, staff in the intervention homes were immediately aware they were taking part in hydration-related training."*
ETHICAL ISSUES AND RECRUITMENT, line 15-18 "Dependent on local management arrangements of the care home, residents were recruited from one division of the care home" It is unclear what a "division" of the care home is in this context and how this helped with the opportunity for staff or residents to decline participation. Could this be explained further or rephrased?	Altered to read *"area / floor".*
RECRUITMENT, line 7- 8 "Although most homes do not have specific procedures in place for participating in research, they were favourable when approached to participate in a hydration intervention." This is an interesting point, do you have any insights that could be included about why this was a favourable topic for homes?	Altered to read: *"Although most homes do not have specific procedures in place for participating in research, they were favourable when approached to participate in a hydration intervention as they all acknowledged this was an ongoing concern in their organisations."*
RECRUITMENT, paragraphs 2 and 3These two paragraphs clearly demonstrate some of the	The final statement in this section has been altered to read:

challenges in recruitment in care homes, it would be interesting to have a sentence or two about what helped or mitigated these challenges in your experience, or to include if on reflection if there is anything other researchers could do to reduce these issues?	*"Such problems remained ongoing concerns throughout the project, and future research in this area should ensure that it allows for significant resources, both in terms of time and staffing, to address this."*
ATTRITION, line 13, is the editor happy with the use of figures rather than words for numbers ten and under?	These have been added.
ROBUSTNESS OF DATA COLLECTION, line 24-25 "However, if research staff are present in care homes that provide services for people with dementia, this could be disruptive and distressing for residents." It's unclear from this sentence if this is a conclusion you drew from your own research, or if this is something found by other researchers conducting research in care homes, if so could a reference be added or the sentence be reworded for clarity?	The term "*unfamiliar*" has been added along with an additional reference to relate this to evidence in this area.