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| Institution: University of West London | | |
| Unit of Assessment: 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy | | |
| Title of case study: I-Hydrate: improving hydration in older people in health and social care settings | | |
| Period when the underpinning research was undertaken: 2015 to 2020 | | |
| Details of staff conducting the underpinning research from the submitting unit: | | |
| Name(s): | Role(s) (e.g. job title): | Period(s) employed by submitting HEI: |
| Heather Loveday | Professor of Evidence-based Healthcare | 1994 to present |
| Jennie Wilson | Professor of Healthcare Epidemiology | 2005 to present |
| Alison Tingle | Research Development Lead | 2006 to present |
| Carolynn Greene | Research Assistant | 2017 to 2019 |
| Aggie Bak | Research Assistant | 2013 to 2018 |
| Deborah Canning | Senior Lecturer, Adult Nursing | 2015 to 2019 |
| Amalia Tsiami | Associate Professor Food Sciences | 2005 to present |
| Period when the claimed impact occurred: 2018 to 2020 | | |
| Is this case study continued from a case study submitted in 2014? No | | |
| 1. Summary of the impact (indicative maximum 100 words) | | |
| <p>Hydration is a fundamental care need which if neglected can lead to numerous adverse health outcomes, including infection, especially in the elderly. The University of West London's I-Hydrate project identified how simple changes in practices and staff awareness could lead to significant boosts to fluid intake. The project team produced a resource pack based on these findings, and this has been used by public health teams, NHS trusts and social care providers to undertake hydration improvement initiatives. These initiatives have led to greater fluid intake by patients, care home residents and service users. Additionally, a commercial provider of digital health products is incorporating the I-Hydrate resources into an app for social care staff which will help them improve their clients' hydration.</p> | | |
| 2. Underpinning research (indicative maximum 500 words) | | |
| <p>The I-Hydrate research project was undertaken in units for the frail elderly in two West London care homes, and led by Wilson and Loveday of the University of West London's Richard Wells Centre. The aims of the project were to optimise the hydration of care home residents, decrease dehydration and associated morbidity, and therefore improve the quality and safety of care.</p> <p>This 18-month project began in October 2015. A local team was created in each of the two homes, including the unit manager, nurses, healthcare assistants, as well as residents and their relatives. The study used a pragmatic observational design and multiple data collection methods to support the development of practical solutions to the problems identified.</p> <p>The study first determined how much fluid residents consumed, and factors associated with consumption including how hydration was organised, delivered and monitored, as well as the fluid and drinking vessel preferences of residents. This baseline assessment found that hydration was not recognised as a care priority; that residents' mean daily fluid consumption was only 1000ml, with no residents consuming the recommended minimum of 1500ml; and that there were infrequent opportunities for residents to be offered a drink or assisted to take one. Fluid intakes were not routinely documented, records not reliable and there was a lack of systems in place to enable a timely response to poor intakes. The study identified the challenges experienced by care homes and residents in meeting this care need and demonstrated the importance of a coherent strategy in improving hydration in this population. [R1]</p> | | |

These initial findings informed subsequent improvement work. Strategies to improve fluid consumption were directed at all residents, as the findings indicated that all were at risk of under-hydration regardless of their level of need. The study used quality improvement methods to develop and test interventions to extend drinking opportunities and choice in the two care homes. Changes were made and evaluated using Plan-Do-Study-Act (PDSA) cycles.

Data were captured on the amounts of fluid served and consumed, and on staff and resident feedback following interventions. The long-term impact of the interventions was assessed by measuring daily laxative and antibiotic consumption, weekly incidence of adverse health events, and average fluid intake of a random sample of six residents captured monthly. The interventions were associated with an increase in the amount and range of fluids consumed. In one home, mean fluid intakes exceeded the recommended minimum 1500ml for three consecutive months. Laxative use decreased significantly in both homes. Practical and organisational barriers were found to affect the sustainability of interventions. [R2]

As part of the programme, the research team designed, delivered, and evaluated an interactive training session to improve the knowledge and skills of care home staff in supporting the hydration of residents. Eighteen sessions were delivered, and 161 participant evaluation forms returned. Training facilitators captured qualitative data in the form of field notes and observations of hydration care explored the impact of training on practice. The study found 1) that focused training on hydration in the care home environment benefits from being interactive and experiential, and 2) that although such training could be effective in increasing staff knowledge, inclusion of skills in reflective practice was required to translate this into practice. [R3]

An important component of the research was establishing the resident perspective. The research team systematically tested residents' opinion of different types of fluid and drinking vessels and as a result established that increasing choice of drink to meet resident preferences is important to enhance intake and that the drinking vessels in common use in UK healthcare settings were very poorly designed for use by the frail elderly. [R4]

Utilising these findings, the UWL research team created downloadable practical resources for care homes, also available as 76-page document; a video series for use in care homes; and an infographic with hints on preventing dehydration in older people. These resources were all made freely accessible on the University website. [R5]

This work informed a successful application to the National Institute for Health Research RfPB Research for Social Care stream to investigate the feasibility of establishing a dysphagia link-practitioner in residential settings to prevent adverse outcomes for people with swallowing difficulties. This further study commenced in October 2019; it was originally due for completion in October 2020, but was extended to May 2021 following the onset of the COVID-19 pandemic.

3. References to the research (indicative maximum of six references)

- R1. Wilson, Jennie; Tingle, Alison; Bak, Aggie; Greene,Carolynn; Tsiami, Amalia and Loveday, Heather (2020) Improving fluid consumption of older people in care homes: an exploration of the factors contributing to under-hydration. *Nursing & Residential Care*, 22 (3). pp. 139-146. DOI: 10.12968/nrec.2020.22.3.139
- R2. Wilson, Jennie; Bak, Aggie; Tingle, Alison; Greene,Carolynn; Tsiami, Amalia; Canning, Deebs; Myron, Rowan and Loveday, Heather (2018) Improving hydration of care home residents by increasing choice and opportunity to drink: a quality improvement study. *Clinical Nutrition*, 38 (4). pp. 1820-1827. DOI: 10.1016/j.clnu.2018.07.020
- R3. Greene,Carolynn; Canning, Deebs; Wilson, Jennie; Bak, Aggie; Tingle, Alison; Tsiami, Amalia and Loveday, Heather (2018) I-hydrate training intervention for staff working in a residential care home setting: an observational study. *Nurse Education Today*, 68. pp. 61-65. DOI: 10.1016/j.nedt.2018.05.014
- R4. Bak, Aggie; Wilson, Jennie; Tsiami, Amalia and Loveday, Heather (2018) Drinking vessel preferences in older nursing home residents: optimal design and potential for increasing

fluid intake. *British Journal of Nursing*, 27 (22). pp. 1298-1304. DOI: 10.12968/bjon.2018.27.22.1298

R5 University of West London I-Hydrate Project, Hydration in Care Homes A practical resource pack to support the hydration of care home residents (2019). Available at: <https://www.uwl.ac.uk/research/research-centres/richard-wells-centre/i-hydrate>

Research quality: Outputs R1 to R4 have all been published in peer-reviewed journals. R2 has been submitted as an output to REF 2021 in this Unit of Assessment.

Research grants:

- I. NIHR Collaboration for Leadership in Applied Health Research and Care Northwest London (CLAHRC), I-Hydrate: A service improvement project to improve the hydration of elderly care home residents (PI: Wilson; project total £168k, including 50% contribution from UWL; Sep 2015 to Mar 2017).
- II. Abbeyfield Research Foundation, Enhancing hydration for residents in care homes with dementia (PI: Wilson; £19k; Jan 2018 to Apr 2019).
- III. Abbeyfield Research Foundation, Assessment of drinking vessel design and use by older adults in a care setting: a multiple methods approach (PI: Wilson; £19k; Jan to Jun 2020).
- IV. NIHR RFPB Social Care stream, Delivering Safe, Effective Nutrition and Hydration Care to Residents with Dysphagia: a theory-based approach to developing a link dysphagia practitioner (PI Wilson; £135k; Oct 2019 to May 2021). Award ID: NIHR200091.

4. Details of the impact (indicative maximum 750 words)

Hydration is a fundamental care need. If neglected, it can lead to numerous adverse health outcomes including urinary tract infections (UTI) and Escherichia coli (E. coli) bloodstream infections, especially in the elderly. These infections have become more prevalent in recent years and are associated with a high morbidity and mortality; reducing their incidence has become an NHS priority.

The I-Hydrate resources have given public health teams, NHS trusts and social care providers a series of simple solutions to help address these issues amongst elderly people. The resources have been used to improve hydration practices and increase staff knowledge and awareness, leading to greater fluid intake by patients, care home residents and service users. Additionally, a commercial provider of digital health products is incorporating the I-Hydrate resources into an app for social care staff. In some instances, as noted below, organisations have paused wider implementation under the pressures of the COVID-19 pandemic but have said they intend to re-start when the situation changes.

In May 2019, I-Hydrate was featured in the Universities UK's *MadeAtUni* campaign, *the Lifesavers – 100+ ways universities are saving lives and keeping us healthy*. [S1]

The I-Hydrate resource pack

The I-Hydrate resource pack has four sections: hydration and the care home environment; improving practice and the Plan-Do-Study-Act cycle; strategies to improve hydration; training your staff. There are also five videos to support use of these resources. [see R5]

The University's data analytics showed that between September 2018 and December 2020 there were 567 unique downloads of the resource pack and over 11,500 unique page views. The "introduction to hydration" video was played over 550 times, and the hydration care and audit sheet appendices were each downloaded almost 500 times. [S2]

Feedback survey forms were sent by the research team to users who downloaded the pack and left contact details. A total of 14 forms were returned by December 2020, and feedback on the pack included the comments from two users as below:

As the nutritionist I have created and delivered hydration training to all our staff. I have also updated and introduced a 35-page hydration policy which is bespoke to our setting and from this there is monitoring and evaluation tasks for me to complete to monitor our hydration procedures and make changes where required. I also have a designated board

which is currently on the topic of hydration. Generally, more awareness for both staff and residents.

This was a great resource for care homes, was easy to follow and resources could be implemented easily by managers at homes. I particularly liked the resources that focused staff on personal reflection about hydration to then put it into context of how this impacts on residents.

A full set of the responses received are included with the sources of evidence for this impact case. [S3]

The I-Hydrate' project video was one of the six resources to improve hydration in care homes featured on the NHS England webpage on "Reducing Gram-negative bloodstream infections – hydration". [S4]

National training programme for care staff in Wales

In 2019, Public Health Wales (PHW) commissioned a national training programme from the I-Hydrate project team after learning about the research at the annual Healthcare Infection Society conference. The training programme was targeted at care home staff and community teams across Wales and aimed to improve resident hydration using the tools and methods in the I-Hydrate resource pack, thereby reducing urinary tract and E. coli bloodstream infections.

A "train the trainer" programme was delivered by Wilson and Loveday for PHW in February and March 2020 with a total of 112 residential and care home staff attending. PHW have reported that:

The programme was highly evaluated on both days training, and improvement plans including use of I-Hydrate and other methodologies were in the process of being developed by a number of the care homes and improvement teams; however, the COVID-19 pandemic has created considerable challenges in the social care sector and we have been unable to move this forward at the pace we had anticipated.

The I-Hydrate project is also featured on the PHW UTI webpage as the listed resource pack for Hydration. [S5]

Local care system initiatives – Hertfordshire and Kirklees / Wakefield

The I-Hydrate research and resource pack has been used to underpin initiatives to improve hydration and prevent UTI in both acute healthcare and long-term care settings.

In Hertfordshire in 2019, the I-Hydrate team supported a 90-day quality initiative improvement project co-ordinated by the Clinical Commissioning Group (CCG) to reduce UTI across seven acute and community organisations. Project leads from each of the seven organisations worked with an I-Hydrate researcher to identify how they could use the I-Hydrate tools to improve the hydration of their patients or clients.

In the East and North Hertfordshire NHS Trust, the improvement project focused on two elderly care wards where it highlighted the poor fluid intake among patients. Initiatives introduced included protected drinks time, assessment of patient's needs to support drinking and increased focus on staff supporting patients to drink. These initiatives 1) increased the overall amount of fluids drunk, and the number of patients drinking at least 1500ml a day; 2) led to changed staff practices to provide more support for drinking; and 3) increased staff awareness of the problem.

In West Hertfordshire Hospitals NHS Trust the improvement project was focused on wards for patients waiting for transfer of care. The outcomes reported were that 1) the amount of fluid consumed increased by an average of 400ml per patient each shift; 2) staff awareness of the importance of hydration improved; and 3) overall patient satisfaction increased.

Infection Prevention and Control lead staff for both organisations have reported that although roll-out of these strategies was interrupted by the pandemic, they plan to proceed once activity returns to normal. [S6]

Similar strategies were implemented in a care unit in the mental health trust and two care homes. An independent living service for people with dementia used the drinks menu to extend choice

and changed their mugs so that they were larger and easier to hold. These changes led to a 35% increase in the amount of fluid drunk by the service users. [S7]

The Infection Prevention and Control (IPC) Team for Kirklees and Wakefield Councils used the I-Hydrate resource pack as the principal tool in a Hydration Champions initiative that began in 2019 and engaged all their care home and domiciliary care providers. Following a launch, Hydration Champions were given a hard copy of the I-Hydrate resource pack to take back to their place of work. The resources were used to identify problems with how residents were hydrated, and design solutions which were implemented over a 6-month period using quality improvement methods. Solutions adopted included increased choice of drinks, regular blind tasting sessions to find new favourites and larger drinking vessels. One care home reported a reduction in residents treated by their GP for a UTI in the summer months from 12 in 2018 to 2 in 2019. The lead IPC staff for the initiative reported that the learning from the Hydration Champion project has resulted in changes in practice in the participating areas, which has been shared across Kirklees and Wakefield. [S8]

Developing digital solutions for care homes using I-Hydrate resources

While many residential care settings have limited access to technology, the use of app-based tools is increasing. I-Hydrate is being developed for that market by Elaros 24/7 Ltd, a Sheffield-based company with a portfolio of digital health products focused on the needs of older people. Working with the UWL research team, Elaros have digitised the I-Hydrate tools to integrate them into one of their existing hydration monitoring applications. The company CEO has written to say:

We identified these resources would enhance the value of our digital solution to fluid monitoring in care homes (Hydr8) as it would provide care staff with information about the problems associated with dehydration and simple strategies to overcome poor fluid intakes in residents identified by the monitoring system. We have therefore developed the I-Hydrate resources into a digital solution which will make them more accessible to staff in care homes than the document format.

The CEO further reported that although the timeframe of the development programme had been affected by the COVID-19 pandemic, they were confident that the digital solution will be a valuable product that can be sold across the care home sector and used to support better hydration for care home residents, improving their quality of life and standard of care. [S9]

5. Sources to corroborate the impact (indicative maximum of 10 references)

- S1. <https://madeatuni.org.uk/university-west-london/keeping-older-people-hydrated>
- S2. University of West London, I-Hydrate data analytics report for period 14/9/18 to 31/12/20.
- S3. University of West London, Hydration in Care Homes Resource Pack Survey results.
- S4. <https://www.england.nhs.uk/gram-negative-bloodstream-infection-reduction-plan-and-tools/reducing-gram-negative-bloodstream-infections-hydration/>
- S5. Testimonial from Senior Scientist, Healthcare Associated Infection, Antimicrobial Resistance & Prescribing Programme (HARP), Public Health Wales, dated 15/3/21 and <https://phw.nhs.wales/services-and-teams/harp/urinary-tract-infection-uti-resources-and-tools/>
- S6. Joint testimonial from Deputy Director, Infection Prevention Control, West Hertfordshire NHS Trust and Head of Infection Prevention & Control, NHS Herts Valleys CCG, NHS East & North Hertfordshire CCG and NHS West Essex CCG and Coordinator for the 90-day UTI Quality Improvement Project), dated 17/3/21; and further documents on the improvement project.
- S7. Herts Valley CCG, 90-Day Hydration Improvement Projects, Dec 2019
- S8. Testimonial from Senior Infection Prevention and Control Nurses, Social Care Directorate, Kirklees Council, dated 19/3/21
- S9. Letter from CEO ELAROS 24/7 Ltd, dated 11/3/21.