Tackling ageing continence through theory, tools and technology (TACT3)

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Key findings

Patient perspective – continence services

Three themes were identified from interviews with older people which were perceived by participants as being important for providing a quality continence service for this group:

1. Accessibility of continence services.
2. Establishing a positive relationship with the continence service professional.

Professional perspective – continence services

The following key continence service features were identified from the survey of professionals:

1. Patient education about continence.
2. Creating a friendly and welcoming environment for patients.
3. Involving patients and carers, in decisions about the choice of treatments.
Public perspective – Environment barriers to continence

Three key themes that users considered a priority:

1. Cleanliness – it was important that toilets are seen to be clean, to communicate wider hygiene confidence.

2. Functionality – equipment in the facilities had to be seen to work.

3. Technology – users appreciated technological innovations to improve toilet provision.

Toilet provider perspective

The key issues raised by many of the providers included:

1. How to keep the toilet facilities to a high standard expected by members of the public

2. How to deter non-toileting behaviour such as graffiti and vandalism, illegal drug use and public sex activities.

The Great British Public Toilet Map was developed to help fulfil the needs of both parties.

Smart underwear that detects leakage from a continence pad

Successfully developed clinical prototype that over 90% of participants who tested it thought would or might make them feel more confident and has a positive impact.

Colour change odour detector

The odour detector had 90% response rate, in vitro and responded within 2 minutes of exposure to stale urine. In the clinical evaluation, 90% of users said it was a good idea and 80% thought it easy to use.

Background

In a world where we experience ever decreasing levels of social inhibition, continence problems remain taboo. As people age, they typically become less mobile and/or need more frequent ‘comfort breaks’ so maintaining continence becomes a challenge. While incontinence is not a direct consequence of ageing, urinary incontinence affects up to 60% of women over 40; with around half as many men suffering the problem. The prevalence of faecal incontinence is around 1% in the general population, rising to 17% in the very old and as much as 25% in care homes. Several of the most common conditions of the ageing population are risk factors for incontinence; for example diabetes, heart disease, obesity and mobility problems.

The impact of continence difficulties is far more than just the physical effort and expense of continence management; the problem is strongly associated with reduced self-esteem, social isolation and depression. Moreover, one of the major reasons that people move into residential care is an inability to cope with their continence needs.

The overall aim of the TACT3 project was to reduce the impact of continence difficulties for older people. We addressed these challenges with three research work-packages focussed on different aspects of continence issues and an overarching knowledge transfer package which ensure stakeholder engagement and dissemination.

One of our research workpackages aimed to challenge environmental barriers to continence by investigating toilet provision outside the home and working with toilet users of all ages and toilet providers to design innovative solutions for 21st century toilet provision.
We set out to improve interventions and services by investigating three different types of continence services, a surgical service and community continence service and a specialist continence service. We explored the needs and preferences of users, families, carers and professionals by surveys and interviews to determine the best provision for older people.

We also want to develop and test two assistive devices that had been requested by people who use continence pads. One device that we developed was a colour change odour detector to reassure pad users by alerting them to the smell of stale urine before it can be detected by the human nose. The second device was the Smart underwear designed to detect a leak from a continence pad before the urine can spread to outer clothes or furniture.

Our two Canadian linked projects, investigating outcome measures for the success of continence technology and trialling new to the UK continence promotion interventions were invaluable in covering important aspects of continence research not addressed in the main TACT3 project.

Findings
Challenging environmental barriers to continence

We were advised by the New Dynamics of Ageing programme’s Older People’s Reference Group to include people of all ages in our research. We therefore chose a methodology in which we included the toileting needs of ages 0 –100 to build a picture of key aspects of design that participants across the age ranges liked and disliked. In total 101 people were interviewed and invited to take part in design workshops, which were held after the interviews were complete. In total seven people (two men five women) attended the workshops where they took part in a participatory design game designed by the researchers which encourage attendees to build their own toilet facilities.

Three key themes that users considered a priority emerged from the workshop were:

- **Cleanliness** – it was important that toilets are seen to be clean, to communicate wider hygiene confidence.
- **Functionality** – equipment in the facilities had to be seen to work.
- **Technology** – users appreciated technological innovations to improve toilet provision.

Data from the interviews and workshops were then consolidated to create four personas; Yasmin a 26 year old Trainee Teacher with Irritable Bowel Syndrome (IBS), Paul a 38 year old photographer with three young children, Judith aged 60 and recently retired, who also cared for her mother and finally Leonard aged 82 who required a walking aid for physical mobility. The personas were specifically developed to communicate a cross section of user needs to toilet providers.
User Participation – Toilet Providers

UK toilet provision is currently divided between a number of varied providers. Some ‘stand-alone’ facilities are offered by local authorities, other provisions may be part of the transport infrastructure (bus and train stations). Toilets are also provided in cafes, bars, pubs and restaurants. Whilst there has been a decline in UK ‘public’ toilet provision, ‘publicly accessible’ toilets are still widely available. To understand some of the issues providers face in maintaining provision, especially to a standard expected by users, we interviewed 22 different providers and associated professionals. These included council officers overseeing public and community toilet schemes as well as representatives from park and transport services, cleaning contractors, architects, and business providers.

The key issues raised by many of the providers included, how to keep the toilet facilities to a high standard expected by members of the public and how to deter non-toileting behaviour such as graffiti and vandalism, illegal drug use and public sex activities.

Bringing the experiences of both members of the public and toilet providers together, we found that information about facilities, such as where they are, and the level of access they provide (including a unisex accessible cubicle and baby change facilities) was very often not provided, not easy to find, insufficient or out of date. Poor information often had serious consequences for people with continence concerns. For providers, ensuring information was current and up-to-date proved to be a challenge. Yet, good information on toilet provision would ensure that people knew about facilities and probably increase usage. In turn – such an increase of usage may deter non-toileting behaviours that tend to take place when facilities are not used.

The Great British Public Toilet Map

The researchers working on the Challenging Environmental Barriers workpackage found that current UK toilet provision is not centrally collated and no national map or database of toilets exists. However, the UK Government’s commitment to greater transparency in local government has developed an open data strategy in which information about services is released, analysed and used by members of the public. By incorporating open data on public toilet provision, the researchers developed The Great British Public Toilet Map (GBPTM), a public participation website to improve information about the UK’s public toilets. The GBPTM aims to encourage local authorities to provide and maintain public toilet information as open data and in a cost effective way.

Toilet data already released is shown on the map so that people can find facilities. If a council has not yet published open data about local toilet provision, users will be able to contact the council with a sample letter to explain why this information is useful, and encourage the council to contribute to The Great British Public Toilet Map.

Publicly Accessible Toilets Design Guide
http://www.hhc.rca.ac.uk/CMS/files/Toilet_LoRes.pdf

Great British Public Toilet Map (GBPTM)
http://greatbritishpublictoiletmap.rca.ac.uk/
Improving Continence Services

Study 1 Patient perspective

123 participants aged over 50 years with a diagnosis of urinary incontinence were recruited from three different settings in South Yorkshire. The settings were a specialist clinic for older people (Barnsley District General Hospital); a community clinic (Sheffield Primary Care Trust) and a surgical setting (Urogynaecology, Sheffield Teaching Hospital).

We found that all participants were “fairly” satisfied or better with the continence service they had received. There were differences, however, in the levels of participant satisfaction with the quality of clinical care they had received. 50% of participants attending the specialist clinic for older people were completely satisfied with the quality of care they had received compared to 46% of participants attending a community clinic and 43% of participants attending a surgical service. More than 80% of the patients we spoke to reported that the cause of their problem and treatment for it was explained to their satisfaction. All participants felt that the continence service provided a comfortable environment and most reported that there was adequate privacy.

Most participants were involved in decision-making about treatment, although less than 60% reported being offered a choice of treatments. Only 9% of patients attending a surgical service were offered a choice of continence aids/products compared to 38% and 36% of patients attending a specialist and a community service respectively.

Three themes were identified from interviews with older people which were perceived by participants as being important for providing a quality continence service for older people:

1. Accessibility of continence services.
2. Establishing a positive relationship with the continence service professional.
3. Reducing impact of UI on everyday life.

Study 2 Professional perspective

The following key continence service features were identified from the survey of professionals:

1. Patient education about continence.
2. Creating a friendly and welcoming environment for patients.
3. Involving patients (and carers), in decisions about the choice of treatments.
4. Involving the patient in identifying treatment goals.

We indentified five service provision themes from our interviews with continence service managers:

1. Rapid and appropriate patient referral pathways
2. Continence education
3. Patient assessment regardless of age
4. Continence at an individual level rather than pad provision
5. Investment in service capacity

The themes ‘rapid and appropriate patient referral pathways’ and ‘continence at an individual level’ consisted of two sub-themes: ‘ageist beliefs and attitudes about UI’ and ‘collaboration with other services’. Addressing these important areas may lead improved continence service for older people with urinary incontinence.

TACT3 showcasing interactive Great British Toilet Map in London
Developing Assistive Technologies

User focused design techniques were employed to design the ergonomic and aesthetic features of the assistive technologies. Focus groups of 2–5 women were invited to discuss the problems of pad leakage and odour, underwear styles, odour detector configurations, alerting methods and the appearance of the devices. The device developed were as follows:

1) Smart underwear with integral sensors and a detachable signalling system that can detect a leak from the continence pad and alert the wearer. The alerting signal warns the wearer, allowing them to deal with the problem before the urine spreads to outer clothes or furniture. The device should save the work and the cost of washing and cleaning. More importantly it should increase the confidence of the wearer who will know immediately if the pad leaks and not have to deal with the embarrassment of a wet patch on clothes or furniture.

2) A colour change odour detector that can detect sub-olfactory levels of ammonia. The detector is designed to reassure pad users by alerting them to the odour of stale urine, before the human nose can detect it.

Clinical prototypes of the devices were made and continence pad users were recruited to evaluate them both.

The Smart Underwear was found to be effective and acceptable for five out of 10 users in its current form, would be effective and acceptable to a further three out of 10 users with some modification, such as a reduction in the size of the signalling system.

Over 90% of participants thought the Smart Underwear would or might make them feel more confident and has a positive impact. A multi-national company has signed an option agreement to investigate further refining and manufacturing the Smart Underwear.

The odour detector we developed had a 90% response rate, in vitro, and responded within two minutes of exposure to stale urine. Clinical evaluation of the odour detector was difficult because although the device responded to odiferous urine over 90% of the time in the laboratory, we were unable to guarantee that the device would work reliably for individual participants. We thought that it was unacceptable to ask participants to check the functioning of the device since it would involve asking other people to report that they did or did not smell. We therefore asked participants to evaluate the prototype product without an objective measure of product function, ie we asked participants purely for their feedback on the design, with their subjective opinions about function.

In the clinical evaluation, 90% of users said it was a good idea and 80% thought it easy to use. Most thought it would give them more confidence, but were not sure until they could test a fully guaranteed device. All participants were concerned about odour.

“The smart underwear and sensor made me feel more confident as I had warning about leakage; incontinence is something that is embarrassing, this product gives you more confidence to lead a normal life”

Woman aged 57 years evaluating Smart Underwear

“extremely useful, why didn’t someone think of it before?”

Woman evaluating odour detector
TACT3 Stall at the 2010 Research Fair
Conclusions

The TACT3 project has made significant progress towards addressing some of the major issues associated with continence difficulties. Working closely with older adults, patients, clinicians, toilet users and providers we have begun to provide resources to address some of the major challenges that impact on people with continence problems.

Our ongoing and future tasks include; securing funding to develop and maintain the Great British Toilet Map; ensuring that clinicians and managers with continence service responsibilities are fully informed about our project findings; working with industry to further develop and commercialise the Smart Underwear and the odour detector.

In addition, our Canadian-linked projects have demonstrated the value of continence promotion in the community and the importance of stigma reduction in improving the lives of people with continence problems.

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