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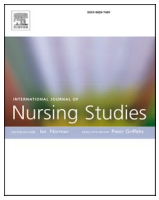

Assistive technology products for toilet-use and continence containment problems in the home setting: A mapping review

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ABSTRACT

Purpose: This study aimed to identify common toilet-use and continence containment problems among community-dwelling adults, explore the range of assistive products available for these issues, and map the products identified to the problems they address.
Design: A mapping review methodology was employed, modified to include grey literature, to identify the full range of toilet-use and continence containment assistive products that are designed for use in the home setting.
Methods: An initial inventory of toilet-use and continence containment problems was derived from toilet-use task sequence analysis and commonly occurring containment challenges. This was supplemented by scoping searches of grey literature and refined with feedback from partner representatives. Assistive products were identified through structured online searches and review of seminal texts. A nurse researcher with community health experience then mapped the categories of assistive products to the identified problems.
Results: Thirty-three toilet-use and containment problems were identified, stratified into 295 subproblems based on end-user characteristics, including physical and cognitive function, and urinary or faecal voiding needs. The search revealed 163 categories of assistive products and mapping these to the subproblems resulted in more than 1500 product-to-problem links. No suitable assistive product options were identified for six sub-problems.
Conclusion: Given the diversity of toilet-use and containment challenges faced by community-dwelling individuals and the array of available assistive products, this novel study highlights the complexity of matching products to individual needs. These findings emphasise the need for better resources to support individuals, caregivers and healthcare professionals in optimising decision-making on and selection of toilet-use and continence containment products.

What is already known

- Enabling people to remain at home often depends on having access to the right assistive technology product for toilet-use or continence containment needs.
- Many people are unable to obtain products that meet their specific toileting and containment requirements.
- Access pathways are fragmented, and no single professional group has full oversight of the entire range of toilet-use and containment assistive products.

What this paper adds

- A novel framework capturing the full range of toilet-use and containment problems was developed through an iterative mapping process, informed by input from people with lived experience and clinical expertise.
- A wide range of assistive products were identified, but many lacked comprehensive information on intended use.
- An accessible resource to facilitate shared decision-making is needed to help end-users, caregivers, and professionals select the most appropriate product from the options available.

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1. Introduction

Urinary and faecal incontinence are prevalent worldwide (Mack et al., 2024; Pizzol et al., 2020). The impact on those affected is profound, with sequelae including social isolation (Yip et al., 2013), skin damage (Babino and Argenziano, 2023), diminished quality of life (Pizzol et al., 2020), depression and anxiety (Cheng et al., 2020; Wang et al., 2023). Treatment options vary according to the type of incontinence, but a substantial proportion of people cannot be cured and require containment products for effective management (Riemsma et al., 2017), aids to facilitate toileting (Freedman et al., 2014) or both (Cheater et al., 2008). The ability to use the toilet independently, or to effectively contain urinary and faecal leakage when this is not possible, supports peoples' preference to remain in their own homes for as long as possible and aligns with the ageing-in-place policy initiatives evident in many developed countries (Genge et al., 2023; Wagg, 2019). Indeed, managing incontinence significantly increases the burden of care and influences caregivers' decisions to institutionalise, while more effective support can prevent or delay this outcome (Bektas Akpinar et al., 2023; Brenner et al., 2023; Scheibl et al., 2019).

The importance of assistive technology products (assistive products) in supporting continence management was recognised by the World Health Organisation (WHO), listing incontinence products as one of its top 50 priority assistive technologies and publishing detailed specifications for absorbent washable and reusable incontinence products (WHO, 2019, 2016). WHO define assistive products as external products that maintain or improve a person's function and independence, thereby promoting well-being (WHO and UNICEF, 2022). A wide array of containment and toilet-use assistive products is available (Bliss et al., 2023), but most people who require these products are unaware of and cannot access the full range. The WHO's rapid assistive technology assessment survey of 35 countries found that only 26.7 % of people who need continence products had access to them (WHO and UNICEF, 2022). In the US, it is estimated that 24 % of older people have full access to the relatively inexpensive toileting aids they require, while 32 % have only partial access and 44 % have no access to toileting aids (Lam et al., 2021). Continence assistive products are among the most frequently used products in England but compared to other assistive products more often incur out-of-pocket costs (Austin et al., 2023). When assistive products are provided through public funding pathways, the generic options offered often result in unused or abandoned products because they prove unsuitable for the individual's needs and lifestyle (Austin et al., 2023; Drennan et al., 2011; Howard et al., 2022).

The mixed economy landscape of continence and toilet-use assistive product provision in developed countries, where access relies on state provision, reimbursement schemes and private purchase (Gibson et al., 2015), makes obtaining reliable information on assistive products especially important. However, previous research has identified the limitations of accessing information on assistive product options online, including a lack of results that are tailored to the end users' individual needs and incomplete or unreliable information (Danemayer et al., 2023; Howard et al., 2022; Leo et al., 2018; Smith et al., 2019). Nurses are perceived as a trusted source of information on assistive product options(Smith et al., 2019), but this perception is not always borne out (Drennan et al., 2011; Murphy et al., 2019; Smith et al., 2019), and not all professionals feel equipped to take on this advisory role, in part due to the difficulties in accessing accurate assistive product information (Austin et al., 2023; Danemayer et al., 2023; Omosigho et al., 2024). Further complicating this scenario, many people benefit from using both toilet-use and continence assistive products, yet expertise is typically divided across different professional groups, with nurses advising on containment products and occupational therapists, or equivalent rehabilitation professionals, focusing on toilet-use products. There are numerous publicly available websites, e.g. the Disabled Living Foundation in the UK (2025) and the National Equipment Database in Australia (2025), that list and link to a wide range of toilet-use and continence products, but none provide a fully comprehensive overview of products available, nor do they give detail on how to choose between the products or for whom they might be suitable.

To enable assistive product end-users, caregivers, nurses and healthcare professionals to access the most suitable products for an individual's needs and circumstances, a comprehensive understanding of the range of problems and potential solutions is required. The objectives of this study were to: 1) identify and categorise all commonly occurring toilet-use and continence containment problems, 2) identify the range of assistive products designed (or adopted) to help people living at home with these problems, and 3) map assistive products to the problems they are designed to address.

2. Methods

A mapping review methodology was employed to identify and categorise assistive products relevant to toilet-use and containment problems. Mapping reviews are best suited to studies that aim to collate data, rather than explore concepts or synthesise outcomes (Campbell et al., 2023; Grant and Booth, 2009). They use a systematic approach to identify, describe, and catalogue evidence, extracting descriptive-level data to highlight patterns and gaps across a broad topic area and applying this to a predefined framework (Campbell et al., 2023; Grant and Booth, 2009). In the present study the framework, an inventory of toilet-use and containment problems, was developed with key representatives and refined based on the products identified.

Grey literature sources were searched to identify assistive products currently in use. This approach was necessary due to the limited body of published research on available assistive products, with most studies focusing on a relatively small range. Since the objective was to discover the breadth of toilet-use and containment problems and the assistive products that might address these, commercial literature and non-empirical sources were deemed particularly relevant.

2.1. Identifying toilet-use and containment problems

With the goal of identifying and categorising all toilet-use and continence containment problems, analysis of the task sequence of toileting and circumstances that pose specific containment challenges guided the development of an initial problem inventory, compiled by two researchers (MW, CM). These problems focused on functional or practical difficulties and needs (e.g. unable to flush the toilet or containing urine during exercise) as opposed to medical diagnoses. Problems that could be directly addressed by toilet-use and continence assistive products were distinguished from those necessitating other types of assistive product, such as mobility aids, which were beyond the scope of this study.

Wide-ranging scoping searches of the grey literature were conducted by the researcher (MW) to uncover additional toilet-use and containment problems. Sources comprised continence charity and not-for-profit websites, online assistive product catalogues, and continence or condition-specific (e.g. dementia or physical disability) discussion forums or blogs. These sites included resources developed by the research team in conjunction with international colleagues, such as the Continence Product Advisor website (International Continence Society, 2025), an independent website providing evidence-based information on continence and toilet-use products hosted by the International Continence Society, and the International Consultation on Incontinence's "Management Using Continence Products" (Bliss et al., 2023).

Other sites were identified from targeted Google searches using variations of internationally relevant keywords such as 'incontinence', 'toilet' or 'bathroom', and 'problem' or 'product' (e.g. toileting issue, bathroom aid). Sources were examined by manually navigating through the site menus, or for discussion forums, queried further using keyword searches where possible.

The preliminary list of problems was presented to key representative stakeholders (n = 5) during an online workshop. The stakeholder group comprised a long-term assistive product-end user, family caregiver, community rehabilitation nurse, and an occupational therapist and physiotherapist, identified via the UK's Association of Continence Professionals for their nationally recognised continence expertise. These stakeholders were selected to represent the key groups involved in selecting and using toilet-use and continence assistive products. They were briefed on the project's intended purpose and scope and invited to provide feedback on the identified problems and the boundaries of products to be included, using their unique professional or end-user perspective. As an example, they emphasised the need to differentiate between products suitable for independent use and those requiring assistance and advocated keeping the list of problems broad to ensure comprehensive inclusion of products.

We subsequently mapped the problems to the WHO (2025) *International Classification of Functioning, Disability and Health* as an internationally recognised standard for describing health and disability at both individual and population levels.

2.2. Assistive product searches

The assistive product search strategy was developed in consultation with an information scientist (LW) and sought to identify and categorise assistive products that addressed the range of toilet-use or containment problems. Products were considered eligible for inclusion if suitable for adult use (≥18) in a domiciliary setting and, for pragmatic reasons, available to the European, North American or Australian markets. Products described in the English language that were identified from credible sources such as academic papers, retailer and manufacturer websites, or other trusted organisations were included if they provided enough detail to infer the product's intended use, even if only minimally described. Products were not included if they could only be found on sources such as personal Facebook pages. Intermittent and indwelling catheter devices and products intended to treat or cure the underlying cause of the incontinence, such as pelvic floor training devices, were not considered assistive products within the context of the present study and were excluded. Prototype products were further excluded to ensure the practical application of the study findings.

To identify assistive products, the researcher (MW) searched the previously presented online sources, reviewed seminal texts, and hand-searched their reference lists for other relevant sources. Online pearl-growing techniques were then employed to identify a comprehensive array of assistive products (Ramer, 2005). This involved Google searches using specific assistive product terminology identified from the preceding searches, with the results guiding subsequent searches. As an example, the search terms used to identify assistive products for the toilet-use problem *difficulty adjusting clothing* (before and after toilet-use) included 'easy fastening clothes', 'drop front underwear', 'dressing aids', 'dressing aid for pants', 'trouser donning aid' and 'adaptive clothing'. Google was also queried to gather additional information on an assistive product's indications and contraindications if the original source provided insufficient detail. Exploratory databases searches using CINAHL and AMED were also trialled for specific products (e.g. those addressing clothing-related toilet access issues) but these did not yield additional products. An example of the full search strategy used to identify assistive products for one problem can be found in Supplementary Material File 1.

Searches were conducted between August 2023 and February 2024. Assistive products identified through this process were grouped into product categories with similar features, using internationally standardised continence and toilet-use terminology where available (Bliss et al., 2023; Fader et al., 2020; International Continence Society, 2025). For toilet use problems, absorbent products were grouped into a single category because volume of leakage was relevant only to this type of assistive product. Where absorbent pads were identified as a potential solution, a corresponding continence containment problem provided more detailed product categories.

2.3. Mapping assistive products to toilet-use and containment problems

A nurse researcher with community care and substantial assistive technology experience (MW) mapped the assistive product categories to the identified problems according to the product indications and contraindications, general safety principles, and the researcher's clinical judgement, with input from the wider team, including members with internationally recognised academic and clinical continence assistive product expertise.

Where product suitability for end users with complex needs was uncertain, ad hoc discussions that drew on clinical reasoning with the team's continence experts informed decision-making. To facilitate mapping of assistive products, some toilet-use and containment problems were divided into sub-problems using an iterative approach, with additional sub-problems introduced as new assistive products were discovered. These sub-problems were largely based on key end-user characteristics, including physical function, cognitive function, sex (male or female anatomy), voiding need (urinary and/or faecal) and volume of leakage (light, moderate or heavy). The criteria for physical and cognitive function were dependent on the nature of the problem. Example sub-problems related to physical and cognitive function include *impaired dexterity affecting the ability to use bathroom sink taps*, and *difficulty navigating to the toilet due to cognitive impairment*, respectively.

3. Results

Overall, a combined total of 33 toilet-use and containment problems and 295 associated sub-problems were identified and mapped to 163 distinct assistive product categories that were designed (or adopted) to address those problems. This resulted in more than 1500 mapping links. An example of part of a mapped problem and the number of assistive product categories that could address each of the sub-problems is provided for illustrative purposes in Fig. 1.

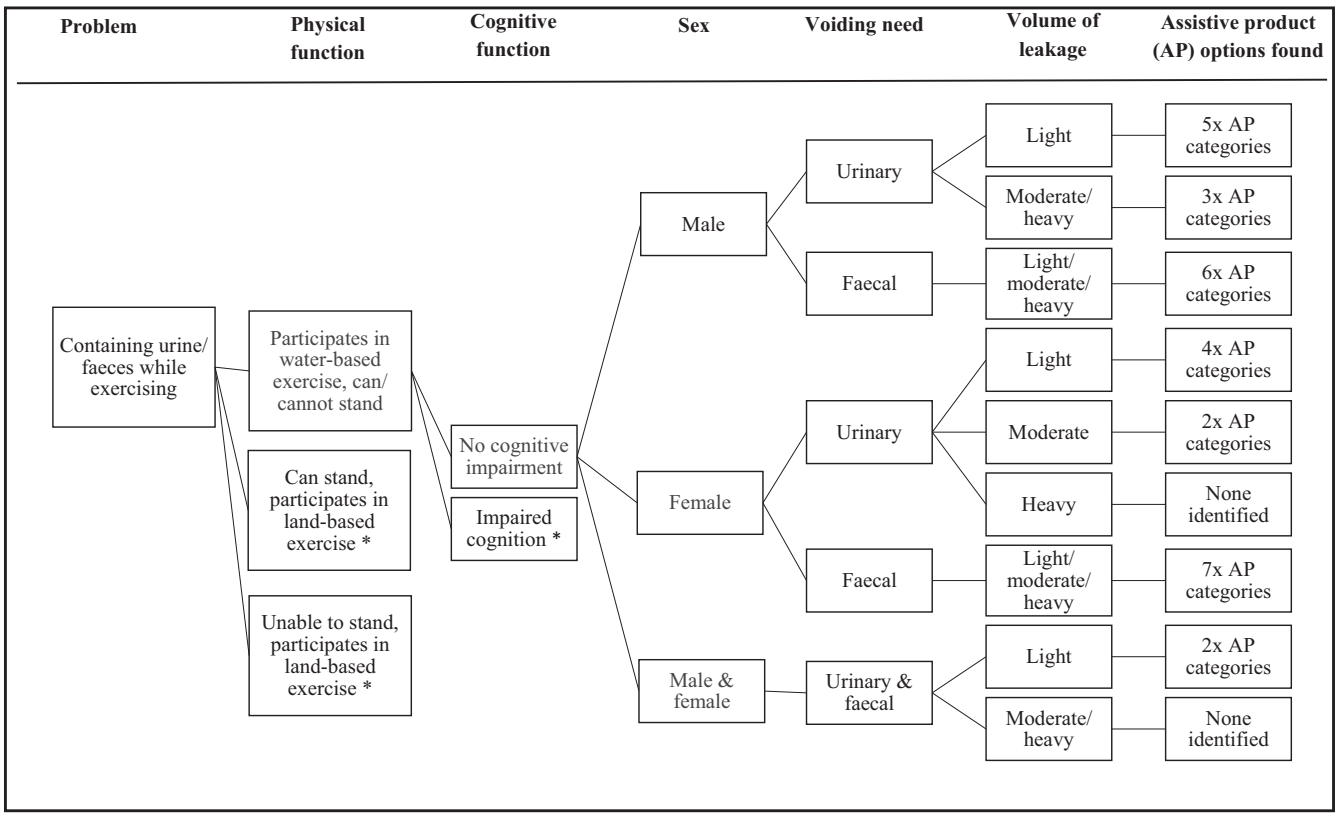
3.1. Toilet-use and containment problems

Twenty-two toilet-use and 11 containment problems were identified, as detailed in Table 1. Toilet-use problems included difficulties with access (n = 7), issues during use (n = 9), using toilet alternatives (n = 2) and concerns related to hygiene and personal care (n = 4). Containment problems focused on containing leakage in specific situations (n = 4), reducing the impact on the personal environment (n = 2), and addressing practical aspects of containment assistive product use (n = 5).

Examination of the sub-problems for each toilet-use problem revealed that most were stratified by physical function (86 %) and cognitive function (59 %) (Table 2). However, the construct of physical function varied widely, with examples including the ability to mobilise, stand, transfer sideways, and impairments in dexterity, range of movement, reach, and vision.

For some problems, physical function described varying levels of ability, such as *voiding in bed,* contextualised as the ability to sit on the edge of the bed, lift the buttocks, roll sideways (with or without caregiver assistance), and a limited ability to change position (e.g. due to pain or contractures). In contrast, cognitive function generally considered the presence or absence of cognitive impairment.

Voiding need (e.g. urinary and/or faecal) and gender were pertinent to fewer toilet-use problems, with sub-problems created for 45 % and 32 % of problems, respectively, while volume of leakage did not apply to any toilet-use problems. The problem *using a toilet away from home* did not include any of the previous characteristics and was instead stratified by specific access issues: *anticipating the need to use the toilet, locating a toilet, and gaining timely access*. The number of sub-problems for each



* Subsequent sub-problems omitted from diagram for simplicity.

Fig. 1. Example of a mapped problem: containing (urine/faecal) leakage while exercising.

toilet-use problem ranged from 2 to 31. A combined total of 134 sub-problems were identified across the 22 toilet-use problems.

Most containment problems were stratified according to voiding need (73 %) and volume of leakage (45 %) (Table 2). Physical function, most often defined as the ability to stand for changing or donning of the product, was relevant for 27 % of containment problems. Cognitive function and sex each applied to 36 % of problems. No sub-problems were identified for three containment problems (C6, C9 and C10, Table 2), including *disposal of used products*. The largest number of sub-problems, 54, were identified for the problem *containing leakage during daily activities* (Table 2). In total, 161 sub-problems were identified across the 11 containment problems.

3.2. Assistive products

The search strategy revealed 163 assistive product categories that addressed the 33 toilet-use and containment problems. Assistive products could be broadly assigned into one of seven groups. Example product categories for each of these seven groups are presented in Table 3.

Some categories, such as a vaginal insert for faecal incontinence, consisted of a single product, while others, such as unbacked pads, included many variants with relatively minor design differences. Separate product categories were created for products designed for specific subsets of end users. Examples of these categories include coloured or photoluminescent toilet seats and grab rails targeted at users with cognitive or visual impairment, and toilet seats and toilet frames designed for bariatric users.

3.3. Mapping problems to assistive products

Mapping of assistive product categories to the 295 combined toilet-use and containment sub-problems resulted in 1510 product-to-problem links. The 163 assistive product categories were mapped 560 times to the 134 toilet-use sub-problems and 950 times to the 161 containment sub-problems.

This process revealed six sub-problems for which no suitable assistive product options were found, relating to water-based exercise and difficulty communicating containment needs, namely:

Related to water-based exercise:

- Heavy urinary leakage in females
- Moderate to heavy urinary and faecal leakage in males and females, with or without cognitive impairment (2 sub-problems)
- Moderate to heavy urinary leakage in males and females with impaired cognition

Related to difficulty communicating containment needs:

- Individuals of either sex with faecal incontinence who are unable to communicate when a product needs changing
- Individuals of either sex with combined urinary and faecal incontinence who are unable to communicate when a product needs changing

More assistive product options were identified for containment sub-problems (mean 6, range 0–16), compared to toilet-use sub-problems (mean 4, range 0–12). The widest selection of products was available for sub-problems related to containing leakage during daily activities and while sleeping. Cognitive impairment often limited the availability of suitable assistive product options across both problem categories. For containment problems, more assistive product options were typically available for males than females, and fewer options were identified when solutions were required to address combined urinary and faecal

Table 1
Toilet-use (T1-T22) and containment problems (C1-C11) mapped to the WHO (2025) International Classification of Functioning, Disability and Health codes.

Problem	ICF mapping (B&F = Body Functions, A&P = Activities & Participation, EF = Environmental Factors)
Toilet-use problems (n = 22)	
Access	
T1: Safely getting on or off the toilet	A&P d4200 - Transferring oneself while sitting
T2: Navigating to the toilet	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T3: Remembering to use the toilet	A&P d5300 - Regulating urination, A&P d5301 - Regulating defecation
T4: Reaching the toilet in time (daytime, indoors)	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T5: Reaching the toilet in time (night)	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T6: Unable to recognise bladder/ bowel signals to prompt toilet-use	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation A&P b630 - Sensations associated with urinary functions A&P b5253 - Faecal continence
T7: Using a toilet away from home	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation EF e1501 - Design, construction and building products and technology for gaining access to facilities inside buildings for public use EF e1502 - Design, construction and building products and technology for way finding, path routing and designation of locations in buildings for public use
Toilet-use	
T8: Maintaining balance while seated	A&P d4153 - Maintaining a sitting position
T9: Sitting comfortably	A&P d4153 - Maintaining a sitting position
T10: Protecting skin and tissue integrity	b810 Protective functions of the skin
T11: Exceeding the size accommodated by the toilet	EF e1551 - Design, construction and building products and technology for gaining access to facilities in buildings for private use
T12: Difficulty adopting/maintaining a good position for bowel movement	A&P d4103 - Sitting A&P d4153 - Maintaining a sitting position
T13: Directing urine into the toilet	A&P d5300 - Regulating urination B&F b1143 - Orientation to objects
T14: Lifting the toilet lid/seat	A&P d4402 - Manipulating (fine hand use) A&P d5300 - Regulating urination A&P d5301 - Regulating defecation B&F b1143 - Orientation to objects
T15: Lowering the toilet lid/seat	A&P d4402 - Manipulating (fine hand use) A&P d5300 - Regulating urination A&P d5301 - Regulating defecation B&F b1143 - Orientation to objects
T16: Difficulty flushing	A&P d4401 - Grasping (fine hand use) A&P d4402 - Manipulating (fine hand use) A&P d4450 - Pulling (hand and arm use) A&P d4451 - Pushing (hand and arm use) A&P d4452 - Reaching (hand and arm use) B&F b210 - Seeing functions B&F b1143 - Orientation to objects
Toilet alternatives	
T17: Voiding while seated in a chair or wheelchair	A&P d410 - Changing basic body position A&P d420 - Transferring oneself
T18: Voiding while in bed	A&P d410 - Changing basic body position A&P d420 - Transferring oneself
Hygiene and personal care	
T19: Using toilet paper/roll	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T20: Difficulty cleaning oneself after toilet use	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T21: Difficulty adjusting clothing	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
T22: Difficulty washing hands	A&P d5300 - Regulating urination A&P d5301 - Regulating defecation
Containment problems (n = 11)	
Containing leakage	
C1: Containing leakage during daily activities	B&F b6202 - Urinary continence B&F b5253 - Faecal continence
C2: Containing leakage while exercising	B&F b6202 - Urinary continence B&F b5253 - Faecal continence
C3: Containing leakage while sleeping	B&F b6202 - Urinary continence B&F b5253 - Faecal continence
C4: Containing leakage while travelling	B&F b6202 - Urinary continence B&F b5253 - Faecal continence
Personal environment	
C5: Controlling odour	EF e2609 - Air quality, unspecified
C6: Protecting furniture and bedding	EF e115 - Products and technology for personal use in daily living
Containment product use	
C7: Difficulty communicating containment needs (e.g. absorbent product needs changing)	A&P d330 - Speaking A&P d3350 - Producing body language A&P d5300 - Regulating urination, d5301 Regulating defecation
C8: Forgetting containment products are needed	B&F b144 - Memory functions
C9: Disposal of used products	A&P d640 - Doing housework
C10: Washing reusable products	A&P d640 - Doing housework
C11: Clothing to support and secure absorbent products	EF e1151 - Assistive products and technology for personal use in daily living

leakage in either sex. Most containment options addressed moderate to heavy leakage, though some exceptions were noted, such as assistive products designed for exercise, which more often targeted light leakage (Fig. 1).

4. Discussion

This study employed a novel problem-based approach to comprehensively search for and methodically map assistive products designed to address toilet-use and continence containment challenges for community-dwelling adults. This work is the first to examine the full range of assistive products available in this area. The search revealed a large number of assistive product categories, with their suitability contingent on specific end-user characteristics that varied across the problems considered.

Mapping these assistive product categories to problems resulted in over 1500 product-to-problem links, illustrating the complexity of identifying the most suitable products for individuals. It is therefore unsurprising that individual practitioners or professions (across health and social care) are not fully conversant with all available options for a given patient group. Additionally, eligibility for these assistive products varies depending on local healthcare contexts. While some websites provide information on a subset of assistive products, none were identified that covered the full range. To enable individuals to obtain the assistive products that best meet their needs, support is needed not only in raising awareness of the problems and the potential assistive product solutions, but also in navigating the systems that govern eligibility and access to these devices (Austin et al., 2023; Howard et al., 2022). Given the multi-sectoral nature of this problem and the well-known challenges of integrating health and social care services (Austin et al., 2023), the development of effective solutions will require a systematic approach and buy-in from key parties.

Notably, some (sub)problems lacked suitable solutions, and few

Table 2
Stratification of each toilet-use and containment problem (detailed in Table 1) plus the resulting number of sub-problems.

Problem number	Physical function	Cognitive function	Sex (male/female anatomy)	Voiding need	Volume of leakage	Other	No. of sub-problems
T1	✓	✓					3
T2	✓	✓		✓			3
T3	✓			✓			6
T4		✓	✓	✓			8
T5		✓	✓	✓			8
T6	✓	✓	✓	✓			15
T7						✓	3
T8	✓	✓					3
T9	✓						2
T10	✓						2
T11	✓						3
T12	✓						2
T13	✓	✓	✓	✓			3
T14	✓	✓	✓	✓			4
T15	✓	✓		✓			4
T16	✓	✓					5
T17	✓	✓	✓	✓			11
T18	✓	✓	✓	✓			31
T19	✓						4
T20	✓						5
T21	✓						4
T22	✓	✓					5
C1	✓	✓	✓	✓	✓		54
C2	✓	✓	✓	✓	✓		45
C3		✓	✓	✓	✓		18
C4	✓	✓	✓	✓	✓		29
C5				✓			4
C6							1
C7				✓			3
C8				✓	✓		3
C9							1
C10							1
C11				✓			2

Table 3
Example assistive products across the 163 product group categories.

Assistive product group (and no. of categories in each group)	Example assistive product categories
1. Toilet and commode-related products (n = 54)	Horseshoe toilet seat, toilet flushing aid, raised toilet seat, commode seat cushion, toilet target
2. Bathroom-related products (n = 14)	Grab rail, lever taps, touch-activated taps, braille taps, automatic soap dispenser
3. Furniture and home (n = 16)	Mattress protector, wet bag, bed pad, nappy bucket, waterproof recliner cover
4. Clothing and dressing (n = 26)	Anti-strip clothing, zipper aid, dressing stick, drop front underwear, incontinence swimwear
5. Bodyworn products (n = 35)	Male pad, vaginal insert for faecal incontinence, disposable pull-on pad, sheath, unbacked pad
6. Hygiene management (n = 11)	Bidet toilet, bedpan, bottom wiper, handheld urinal, urine deflector
7. Reminder aids and sensors (n = 7)	Alarm aid, enuresis sensor, toilet seat sensor pad, wetness sensor, wearable bladder monitoring system

options were identified for others, highlighting the need for innovation in assistive product development. Key gaps include containment of heavier urinary leakage and combined urinary and faecal leakage during water-based exercise, as well as assistive products for individuals with faecal or combined incontinence who are unable to communicate when a product needs changing. Addressing these gaps will require interdisciplinary innovation, along with improved research and clinical testing of both existing and newly developed assistive products. Limited evidence on effectiveness of assistive products remains a barrier to product provision, with healthcare professionals expressing concerns about endorsing these products (Danemayer et al., 2023; Howard et al., 2022).

In addition to resulting in poor care for individuals, the provision of suboptimal or inappropriate products contributes to product waste and increases the already substantial environmental and financial burden of continence care (Vaittinen et al., 2024). These assistive products are more likely to be abandoned, leading to increased costs and resource inefficiencies for providers (Austin et al., 2023; Vaittinen et al., 2024). Selecting appropriate products through shared decision-making can improve user outcomes, while reducing the environmental impact of healthcare provision.

Wherever possible, product categories were aligned with terminology adopted by the International Continence Society (ICS) (Fader et al., 2020), as this represents an authoritative internationally developed standard. The Continence Product Advisor website (International Continence Society, 2025) was used to classify products beyond the scope of this standard, ensuring the use of consistent and clinically recognisable terminology. However, variation across classification systems remains, and alternative frameworks such as ISO 9999: Assistive products for persons with disability — Classification and terminology (International Organization for Standardization, 2022) would have produced slightly different product groupings if applied.

This work has broken down the complex nature of toileting and containment problems and solutions into their component parts, producing a detailed 'map' that could underpin the development of a digital tool to support users and healthcare professionals in identifying appropriate product solutions.

The next step in improving decision-making is to review the current evidence on the effectiveness of the toilet-use and continence containment assistive products across multiple outcomes, including health-related quality of life, caregiver burden and quality of life, care facility admission and cost-effectiveness. This work aims to form the foundation of an accessible resource that supports shared decision-making, helping end-users, caregivers, nurses and other healthcare professionals select assistive products based on the users' needs, preferences, and circumstances, irrespective of the provider. Given the lack of access to

even basic assistive products in lower income countries (Murphy et al., 2025), this resource will likely be more relevant to higher income countries. However, it is hoped that it will support the efforts of policy makers and service providers to expand assistive product availability.

5. Strengths and limitations

This study has several strengths and limitations. To our knowledge, it is the first to comprehensively search for and map assistive products addressing toilet-use and continence containment problems for community-dwelling adults. A structured approach guided the identification of common problems, refined through expert input from both healthcare professionals and individuals with lived experience. Assistive product searches followed a systematic process that was developed in consultation with an information scientist. A key strength is the focus on grey literature, which broadened the scope beyond academic research and increased the likelihood of capturing the range of commercially available solutions. The iterative mapping process further provided a granular understanding of product availability, guided by pertinent end-user characteristics.

A limitation of this study is that mapping was conducted by a single researcher. To mitigate this, uncertainties were resolved through team consultation, lending rigour to the mapping process. The inclusion of input from key stakeholders provided both a strength (varied perspectives from expert representatives) and a limitation (all stakeholders were within the UK and all the professionals worked within the National Health Service in England). We did not include a family doctor or any other medical professional as previous research indicates that this group's involvement in the selection of assistive products is limited. Some commercial sources provided limited information on product indications and contraindications, which may have affected mapping accuracy. Where possible, additional sources were consulted to address this, and general safety principles and clinical judgement guided the mapping process. The search was restricted to assistive products available in Europe, North America and Australia and where information was presented in the English language, potentially excluding relevant products. Additionally, as the assistive product market evolves, some identified products may now be obsolete, and new products may have emerged. This study did not consider the effectiveness and cost-effectiveness of the identified assistive products; a systematic review examining this is currently in progress.

6. Conclusion

Toilet-use problems and continence containment are wide-ranging and needs vary widely based on personal characteristics. The choice of continence containment and toilet-use assistive products to help with these needs is extensive with 163 distinct categories identified. This study highlights the complexity of matching assistive products to individual needs, and as such provides clear rationale to provide evidence-based support to optimise decision-making, thereby potentially avoiding or reducing harm and waste from inadequate or inappropriate product use.

CRediT authorship contribution statement

Marjolein Woodhouse: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis. **Miriam Avery:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Lois Woods:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **David Alexander Scott:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Mandy Fader:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **Margaret Macaulay:** Writing – review & editing, Validation, Methodology. **Karen Ashton:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **Catherine Murphy:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Marjolein Woodhouse reports financial support was provided by National Institute for Health and Care Research.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnurstu.2025.105264.

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