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Acceptability of the *'I manage my meds'* toolkit for managing polypharmacy at home among adults aged 65 years and above: a community researcher supported study

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Abstract

Objectives: **This study aimed to evaluate the acceptability of the 'I manage my meds' toolkit in supporting adults aged 65 years and above to manage multiple medications at home. A secondary objective was to assess the extent to which 'I manage my meds' acceptability differs between different demographic groups, in this study, those from a South Asian background.**

Methods: **A community researcher facilitated study was conducted in Bradford, UK. Sixty participants aged 65–94 years, each managing at least five medications, were recruited. As a focus of this study was to explore whether the culturally adapted toolkit was acceptable, half of the sample recruited were from a South Asian background. Participants engaged with the toolkit, available in English and Urdu, before completing a structured questionnaire based on the theoretical framework of acceptability. Quantitative data were analysed using factor analysis, descriptive statistics, and comparative tests between ethnic groups.**

Key findings: **The toolkit demonstrated high overall acceptability, with a mean score of 2.93 out of 4. Acceptability did not significantly differ by age but varied across domains of the framework. Intervention Coherence received the highest ratings, indicating that participants found the toolkit easy to understand, while self-efficacy scored lowest, suggesting some limitations in confidence for medicine self-management. South Asian participants reported significantly higher overall acceptability (mean 3.33) compared with non-South Asian participants (mean 2.61). Significant differences were found across multiple domains, with South Asian participants reporting greater perceived usefulness and fewer barriers to use.**

Conclusions: **The findings indicate that the 'I manage my meds' toolkit is a clear, practical, and well-received resource for older adults managing polypharmacy at home. The culturally adapted version demonstrated high acceptability among South Asian participants, highlighting the importance of tailoring health interventions to diverse populations.**

Keywords medicines management, advice giving, use of internet as information source, E-health

Introduction

Polypharmacy, defined as the use of five or more medicines [1], is a significant public health challenge in terms of management, healthcare provision, and associated costs [2]. The number of people experiencing polypharmacy in the UK has quadrupled over a 20-year period [3]. The increased prevalence of polypharmacy is known to cause higher risk of adverse drug events, drug–drug interactions, non-adherence, as well as increased risk of geriatric syndromes (e.g. cognitive impairment and/or falls) [4]. This leads to an increased risk of hospitalization resulting in greater healthcare expenditure [5].

Advancements in healthcare have contributed to individuals living longer, resulting in a growing population of older adults, particularly in the UK where those aged 65 and above are increasingly prevalent [6]. This demographic is more susceptible to chronic health conditions and geriatric syndromes, necessitating multiple medicines [7]. Medicines management refers to the processes through which patients obtain, understand, organize, administer, and monitor their medicines safely and effectively [8].

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The challenges associated with managing multiple medications for older people are substantial, including increased financial burden, difficulties organizing and monitoring medication schedules, and the overall complexity of coordinating treatment regimens within the home setting [6]. Given these complexities, there is a clear absence of comprehensive interventions addressing support for medicines self-management [8, 9].

Due to the-lack of complex interventions supporting older adults to manage polypharmacy, a medicines management toolkit, 'I manage my meds' was developed using experience based co-design with patients and healthcare staff [10]. This toolkit aims to support adults aged 65 and above who are on multiple medicines in safely managing their medicines within their home environments [8].

The acceptability of health interventions to patients, family members, healthcare providers, and policy makers is a fundamental consideration in health research and practice [11]. When an intervention is not perceived as acceptable by those who deliver or receive it, effective evaluation becomes challenging [12]. Intervention acceptability has been linked to implementation outcomes including uptake, adherence, and overall effectiveness [13]. The theoretical framework of acceptability (TFA) was developed to help assess the acceptability of health care interventions [14]. Acceptability can be defined as a 'multi-faceted construct that reflects the extent to which people delivering or receiving a health care intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention' (pg. 1) [14]. The TFA identifies seven constructs of acceptability: affective attitude, burden, perceived effectiveness, ethicality, intervention coherence, opportunity costs, and self-efficacy. Understanding and measuring these components is significant, as low acceptability may compromise intervention fidelity and reduce effectiveness [14].

It is important to recognize that the acceptability of a health intervention is not static but can vary significantly across populations, contexts, and over time. An important consideration for this study is that some health issues, such as multi-morbidity and associated polypharmacy disproportionately affects particular populations, including ethnic minority communities and older adults, and are often intertwined with broader health inequalities [15]. Although direct associations between ethnicity and polypharmacy remain under-explored [16], there is evidence suggesting that medication adherence is particularly challenging for individuals from ethnic minority groups [17]. Furthermore, certain populations, such as South Asian communities in the UK, have been shown to face barriers to engaging with medication review services [17].

One approach to conducting engaged research and exploring barriers faced by certain populations is to involve community researchers within the research team. Community researchers, or peer researchers, are 'members of the target population who are directly involved in the research process' [18]. These researchers can shape the research design, provide support in data collection and data analysis, and contribute to knowledge translation [19]. Due to trusted relationships with community members, more meaningful and authentic data being collected, informal feedback is more readily collected and disseminated, thus enhancing credibility of findings [18]. To our knowledge, this is the first use of community researchers in measuring acceptability of a health intervention.

Aims:

1. The primary aim of this study is to evaluate the acceptability of the 'I manage my meds' toolkit in supporting adults aged 65 years and above to manage multiple medications at home.
2. The secondary aim is to assess the extent to which 'I manage my meds' acceptability differs between different demographic groups, in this study, those from a South Asian background.

Materials and methods

Ethical approval was obtained from the University of Bradford Research Ethics committee (ref number here). Health Research Authority ethical approval was also obtained (date).

Setting

The study was undertaken within Bradford, West Yorkshire, UK. Bradford is the fifth largest metropolitan borough council with a population of 560 200 [20]. The most recent census reports a White British population of 56.7% and an Asian or British Asian population of 32.1%. Bradford has the second highest percentage of people nationally who identify as Pakistani (25.5%). The census showed that 87.6% had English as their main language, 7.2% speak a South Asian language as their main language.

Participant recruitment and data collection

The study team recruited two community researchers (one from a South Asian background) from within the local community to facilitate community consultation and engagement in the research [18]. They worked in collaboration with the research team to facilitate community engagement, guided on the suitability of research methods, undertook the data collection, and supported with interpretation of the study findings [19]. Potential participants were approached by the community researchers at community organizations and meetings which formed parts of the community researcher's community networks. Participants who expressed an interest in the study had an option of contacting the lead researcher by email or phone, arranging a follow up visit with the community researcher, or to take part on the day of approach. On confirmation of eligibility, participants were provided with a study pack, which contained the participant information sheet, participant consent form, and either a link to the 'I manage my meds' online toolkit or a hard copy of the intervention if preferred (see Supplementary Material). Due to the high percentage of the population of Bradford identifying as Pakistani, all participants from a South Asian background were able to select an Urdu version of the toolkit (either online or hard copy) to reflect the 2.9% of the population that reported Urdu as a main language [20]. After consenting, participants were provided with access to the 'I manage my meds' toolkit either through a printed copy or via an online link. Participants were asked to review the toolkit in their own time and in some cases, participants reviewed the toolkit independently, while others reviewed it during a meeting or workshop facilitated by the community researchers. After

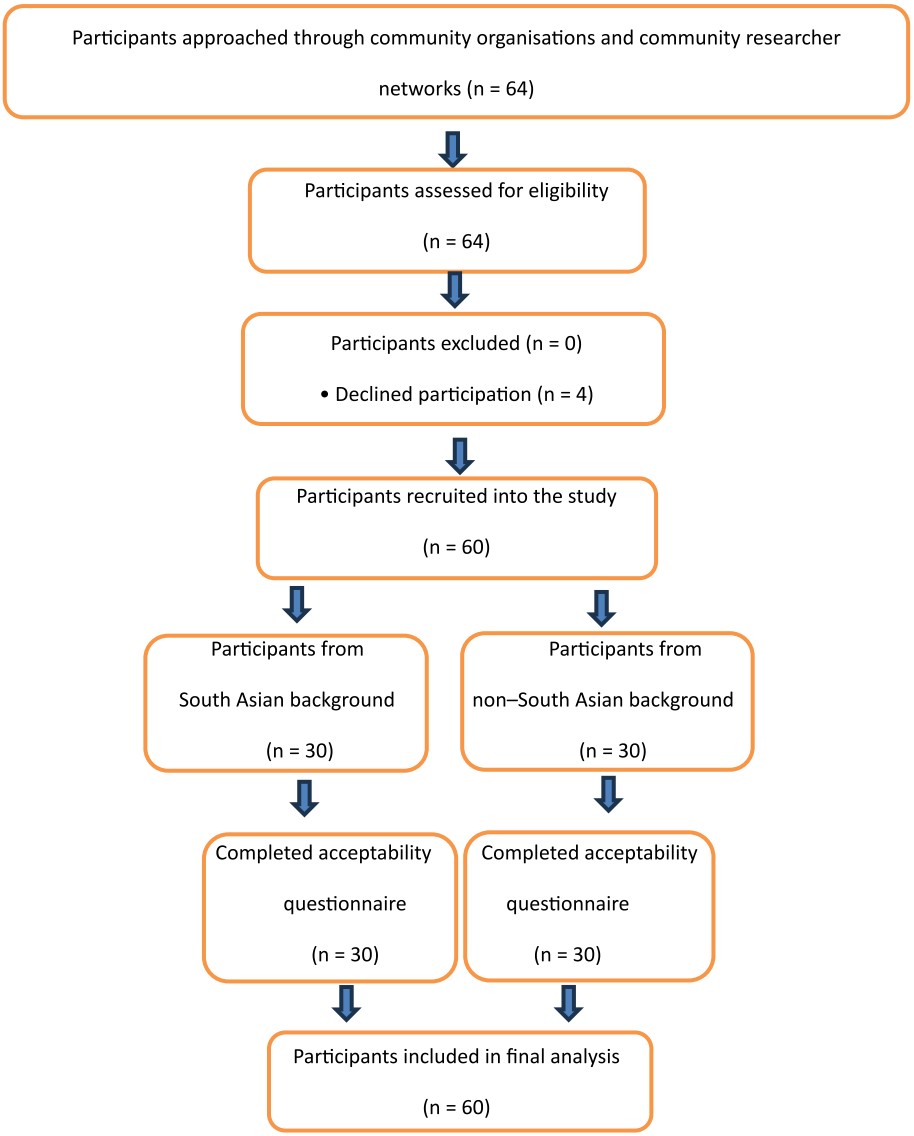

Figure 1 Participant recruitment flow diagram for the acceptability study.

reviewing the toolkit, participants completed the acceptability questionnaire (see Supplementary Material). Some participants completed the questionnaire immediately following their review, while others returned the completed questionnaire at a later time after reviewing the materials at home. The acceptability questionnaire was administered in paper format only. Participants either received the questionnaire by post to their home address or completed it in person during a meeting with the community researchers.

Two comparison groups were purposively recruited with thirty participants in each group. The choice of thirty participants in each group was based on existing recommendations which suggest sample sizes between 24 and 50 are reasonable for acceptability studies [21]. Each group of thirty was within this range of recommendation and a total sample of 60 seemed appropriate for assessment of acceptability according to the sample size recommendations. A participant recruitment flow diagram illustrating the recruitment process and final sample included in the analysis is presented in Fig. 1. Eligibility for participation was open to all adults over 65 years of age who had experience of managing at least five medications at home.

Questionnaire development

The questionnaire was developed by the research team, informed by the TFA [14] and existing literature on the assessment of intervention acceptability [22]. Questionnaire items can be viewed in Table 1. These were reviewed by a lay member of our research team for clarity. Questions were designed to reflect each of the seven dimensions of Sekhon's acceptability framework [14]. The questionnaire comprised 12 items using a 5-point Likert response scale, where responses ranged from 0 (Not at All) to 4 (Very much). Each question was supplemented with open ended questions for participants to discuss why they scored the Likert question as they did. In addition to the acceptability items, demographic information was collected, including age, gender, ethnicity, and number of medications managed. The content validity of the scale was evaluated by four members of the research team, our

Table 1 Questionnaire items related to the seven domains in Sekhon's TFA.

TFA domain	Questionnaire items
1. Affective Attitude (How an individual feels about the intervention)	– On a scale of 0–4 how much did you enjoy taking part in the 'I manage my meds' program? – On a scale of 0–4, how important do you think it is to learn the skills to manage medicines safely?
2. Burden (The perceived amount of effort that is required to participate in the intervention)	– On a scale of 0–4, how easy was it to use the 'I manage my meds' program? On a scale of 0–4, how easy was it to use all the content within the 'I manage my meds' program?
3. Perceived effectiveness (The extent to which the intervention is perceived as likely to achieve its purpose)	– On a scale of 0–4, how confident are you that the 'I manage my meds' program supported you to manage your medications safely at home? – On a scale of 0–4, how confident are you that the 'I manage my meds' program increased or will increase your adherence and persistence with your medications at home?
4. Ethicality (The extent to which the intervention has good fit with an individual's value)	– On a scale of 0–4, how much do you agree that programmes like 'I manage my meds' are needed to help people with the medication at home?
5. Intervention coherence (The extent to which the participant understands the intervention, how it addresses their condition and how it works)	– On a scale of 0–4, how well did you understand the content (including the videos and handouts) in the 'I manage my meds' program?
6. Opportunity (The extent to which benefits, profits or values that must be given up to engage in the intervention)	– On a scale of 0–4, to what extent was the 'I manage my meds' program a good use of your time?
7. Self-efficacy (The participant's confidence that they can perform the behaviour(s) required to participate in the intervention)	– On a scale of 0–4, how confident were you about taking part in the different elements (including the videos and handouts) of the 'I manage my meds' program?' On a scale of 0–4, how confident are you that the 'I manage my meds' program increased your knowledge of managing your medications safely at home? On a scale of 0–4, how confident are you that the information within the 'I manage my meds' program may help you to reduce self-administration

two community researchers, the patient and public involvement and engagement (PPIE) group for the study and two lay leaders associated with our research centre. Community researchers were available to provide support with completion where required, for example reading questions aloud, clarifying wording, or recording participant responses.

Toolkit adaptation

To enhance cultural and linguistic appropriateness for participants from South Asian backgrounds, the 'I manage my meds' toolkit was culturally adapted and translated into Urdu prior to the acceptability study. The adaptation followed an eight-step process used for cultural adaptation of healthcare interventions [23]. The translation process involved forward translation of the materials from English into Urdu by a translation company. The translated materials were then reviewed by community researchers and bilingual members of the PPIE group. This iterative process enabled refinement of wording to ensure clarity and conceptual equivalence between the English and Urdu versions. In addition to surface level translation, specific cultural adaptations were made to enhance the relevance of the toolkit for participants from a South Asian background. These included adapting examples within the toolkit to better reflect cultural contexts, modifying terminology, and ensuring that visual and written materials were meaningful and accessible. Consideration was also given to culturally influenced beliefs and practices around medicines use and self-management. These adaptations were informed by input from community researchers and local stakeholders familiar with the community.

Data analysis

Descriptive statistical analysis, including means, standard deviations, ranges, frequencies, and percentages, were used to summarize participant characteristics and acceptability scores prior to inferential analyses. Exploratory factor analysis (EFA) was undertaken to assess the construct validity of the acceptability domains from the Sekhon [14] acceptability framework. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was done to confirm the appropriateness of the data (KMO = 0.679). The data was suitable for factor analysis, as indicated by an acceptable KMO value of 0.679 and a significant Bartlett's test of sphericity ($P < .001$). EFA was conducted on responses from 60 participants. Items with maximum factor loadings below 0.40 were excluded as they did not demonstrate sufficient association with any underlying factor. A loading threshold of 0.40 is commonly recommended as the minimum value for meaningful interpretation of factors in EFA [24]. Although recommendations suggest participant to item ratios of between 5:1 and 10:1 for EFA, the ratio in this study was ~5:1 (60 participants for 12 items), which falls within the lower range of commonly cited guidelines [24]. In addition to sample size considerations, the KMO value and statistically significant Bartlett's test of sphericity indicated that the correlation matrix was suitable for factor analysis. Given the exploratory nature of this acceptability study, factor analysis was therefore considered appropriate for examining the underlying structure of the questionnaire. Only one item was not included with all other items demonstrated adequate sampling adequacy (Measure of Sampling Adequacy > 0.5), and communalities were generally strong, indicating that the items share sufficient common variance. Principal component analysis

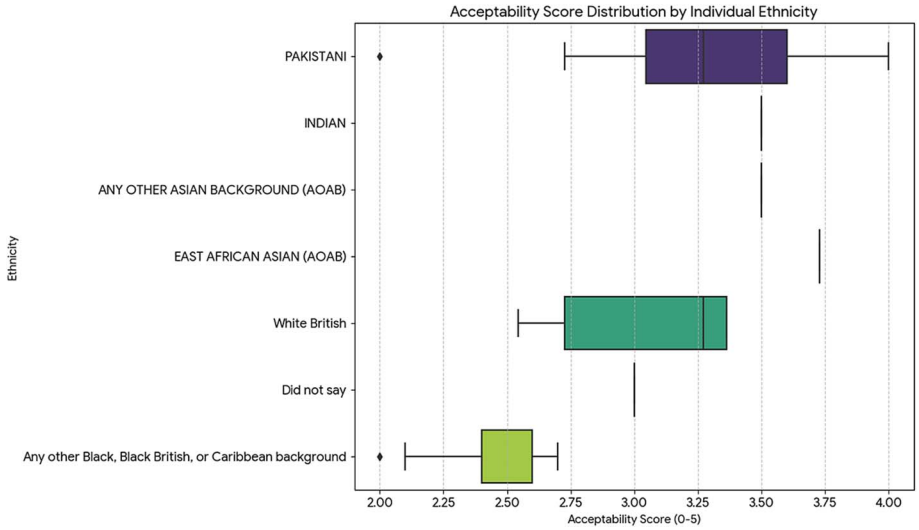

Figure 2 Mean acceptability score by individual ethnicity.

revealed a three-factor solution, explaining 68.86% of the total variance, suggesting a meaningful underlying structure in the responses to the 'I manage my meds' questionnaire. The internal consistency of the tool was also assessed using Cronbach's alpha. With a Cronbach's alpha score of ∼0.78 for the different aspects of the tool this fell within the range of 0.7 and 0.9 generally considered as appropriate for multi-item scales [25]. Wilcoxon rank-sum test was conducted to explore differences between the mean-scores for each acceptability domain and between the South Asian population and the sample group reflective of the remaining ethnic backgrounds living with the Bradford area. Analyses were conducted using available-case analysis. Missing data occurred where participants chose not to answer specific questionnaire items or did not complete all questions. No imputation was performed due to the exploratory nature of the study and the small proportion of missing responses.

Results

Sixty participants were recruited to participate in the acceptability study. The participants were predominantly female ($n = 45$) and aged between 65 and 86 years old. The average number of medications managed per participant was 5.9 (SD = 2.63). A full breakdown of participant characteristics can be seen below in Table 2.

Table 2 Participant characteristics.

Gender	***n* (%)**
Female	45 (75.0)
Male	15 (25.0)
Age group (years)	
65–74	49 (81.7)
75–84	6 (10.0)
85–94	2 (3.3)
Not reported	3 (5.0)
Ethnicity	
Pakistani	27 (45.0)
Any other Black, Black British, or Caribbean background	21 (35.0)
White British	8 (13.3)
Indian	1 (1.7)
Any other Asian background	1 (1.7)
East African Asian	1 (1.7)
Not reported	1 (1.7)
Number of medications managed	
Mean (SD)	5.9 (2.63)

Tool reliability

From the questionnaire, a total of 11 items were included in the factor analysis. One question 'On a scale of 0-4, how easy was it to use all the content within the "I manage my meds" program?' was excluded due to a maximum factor loading of less than 0.40.

Acceptability of the 'I manage my meds' toolkit

The overall acceptability of the 'I manage my meds' toolkit was assessed using a composite score derived from eleven Likert-scale items, each rated from 0 (lowest) to 4 (highest). A total of 60 participants provided the data. The overall rating of the toolkit across all participants was 2.93 on the scale 0–4 (SD = 0.57) with scores ranging from a minimum 1.89 to a maximum 4. Acceptability by age range can be viewed in Table 3. Acceptability score by individual ethnicity can be view in Figure 2.

Table 3 Descriptive statistics for the overall acceptability score by age range.

Age range code	**Mean score**	***N* (sample size)**	**SD**
65–74	2.9427	49	0.55237
75–84	3.0537	6	0.63838
85–94	2.8500	2	1.34350
Total	2.9512	57	0.57593

Table 4 Descriptive analysis of the seven constructs of Sekhon's acceptability framework.

Variable	N	Min	Max	Mean	SD
Affective attitude	59	1.0	4.0	3.30	0.45
Burden	58	2.0	4.0	3.31	0.54
Perceived effectiveness	59	0.0	4.0	2.89	0.92
Ethicality	59	2.0	4.0	3.31	0.56
Intervention coherence	58	2.0	4.0	3.43	0.57
Opportunity	58	1.0	4.0	2.79	0.79
Self-efficacy	60	0.0	4.0	2.39	1.10

The analysis also examined whether the overall acceptability for the toolkit was different between age groups. Acceptability across the age ranges of 65–74, 75–84, and 85–94 was calculated (See Table 2). A one-way analysis of variance (ANOVA) test performed on the variable demonstrated no significant differences between the age groups in terms of acceptability ($P = .881$).

Each of the seven constructs of Sekhon's acceptability framework were also analysed. Intervention coherence had the highest mean score (M = 3.43, SD = 0.57) whilst self-efficacy had the lowest (M = 2.39, SD = 1.10) and also the greatest variability. Full descriptive data of the seven constructs of the framework are presented in Table 4.

Acceptability of 'I manage my meds' for users from a South Asian background

A notable difference in acceptability was observed between South Asian and non-South Asian participants. Participants recorded as from a South Asian background ($n = 30$) reported a higher average overall acceptability of 3.33 compared to an average score of 2.61 for non-South Asian participants ($n = 30$). The Mann–Whitney U test revealed a statistically significant difference in the overall acceptability score between the two ethnic groups ($P < .001$) suggesting participants from a South Asian background for 'I manage my meds' significantly more acceptable. Figure 1 highlights the acceptability score distribution by individual ethnicity. A further breakdown by specific ethnicity can be found in the Supplementary Material. When assessing the different constructs of the acceptability frameworks, the South Asian population had consistently higher scores on these measures compared to the general population. For the constructs *Opportunity* ($P < .001$) and *Self-efficacy* ($P < .001$) the P values were significantly higher for the South Asian population. For *Burden* ($P = .010$), *Perceived Effectiveness* ($P = .004$), and *Ethicality* ($P = .002$) they were also significantly more accepted. The two constructs *Affective Attitude* ($P = .138$) and *Intervention Coherence* showed no significant differences.

Discussion

This study evaluated the acceptability of the 'I manage my meds' toolkit among adults aged 65 years and above who were managing polypharmacy within their homes. Overall, the toolkit demonstrated high acceptability across participants, with an average score of 2.93 on a four-point scale. Acceptability did not significantly differ across age groups, suggesting the intervention was broadly appropriate for older adults within the age range studied. Among the domains of the TFA [14], intervention coherence received the highest scores, indicating that participants found the toolkit easy to understand and the purpose of the intervention clear. In contrast, self-efficacy received the lowest score, suggesting that although participants viewed the toolkit positively, it may have had a more limited impact on their confidence in managing their medications. A key finding of this study was that participants from a South Asian background reported significantly higher levels of acceptability compared with non-South Asian participants across several TFA domains.

A strength of this study was the use of community researchers to support recruitment, data collection, and interpretation of findings. Involving community researchers can facilitate stronger engagement with participants and improve trust between research teams and community members [18]. This approach is particularly valuable when working with populations who may face barriers to participating in health research, including language differences or historical mistrust of institutions [15]. The study also incorporated cultural and linguistic adaptation of the toolkit, including translation into Urdu and consultation with community stakeholders. Such adaptations are important for ensuring that health interventions are accessible and relevant to diverse populations [23].

Several limitations should also be acknowledged. The sample size was relatively small, with 30 participants in each comparison group. Although this sample size is consistent with recommendations for acceptability studies and early stage intervention research, it limits the generalizability of the findings to wider populations of older adults managing polypharmacy. The study only sought to measure perceived acceptability of participants rather than behavioural or clinical outcomes. While acceptability is an important precursor to intervention uptake and effectiveness, the findings do not indicate whether the toolkit improves medication adherence, medication safety, or health outcomes. Additionally, although EFA suggested a meaningful underlying structure for the questionnaire, the relatively small sample size means the factor structure should be interpreted cautiously and confirmed in additional studies with larger samples. Finally, the study did not collect detailed information about participants' previous experiences with medicines management or health literacy, which may influence perceptions of confidence and usefulness when using the toolkit.

The findings contribute to the literature on interventions designed to support medicines management among older adults experiencing polypharmacy. Managing multiple medications can be complex and burdensome, particularly for older individuals who may experience cognitive, physical, or organizational challenges when coordinating medicine regimens at home [6]. Interventions that provide structured support, education, and practical tools for medicines management have therefore been identified as a key strategy for improving medication safety and adherence among older populations [9]. The high scores observed for intervention coherence and burden in this study suggest that participants found the toolkit understandable and easy to use, which highlights the importance of accessibility and clarity in medication related resources for older adults [8].

An important contribution of this study relates to the observed differences in acceptability between South Asian and non-South Asian participants. Participants from a South Asian

background reported significantly higher acceptability across several domains of the TFA, including opportunity, self-efficacy, perceived effectiveness, and ethicality. These findings highlight the potential value of culturally adapted health interventions in improving engagement among ethnically diverse populations. Research has shown that individuals from ethnic minority groups may experience barriers to medication adherence and engagement with healthcare services, including language barriers, cultural beliefs about medicines, and limited access to culturally appropriate information [26]. The cultural adaptations made to the 'I manage my meds' toolkit may therefore have contributed to the higher perceived relevance and usefulness reported by South Asian participants in this study.

Additionally, the lower self-efficacy scores observed across the overall sample suggest that improving confidence in medication self-management may require additional strategies beyond providing informational resources alone. Confidence in managing medications can be influenced by multiple factors, including health literacy [27], previous experiences with healthcare systems [28], and the complexity of medication regimens [8]. It is therefore possible that combining toolkits with additional forms of support, such as pharmacist conversations, medication reviews, or digital reminders, may further strengthen individuals' ability to manage polypharmacy safely at home.

The findings of this study have several implications for policy and clinical practice. As populations continue to age and the prevalence of polypharmacy increases, supporting safe medicines management within community settings is becoming an increasingly important public health priority [2]. Practical and accessible resources such as the 'I manage my meds' toolkit may provide value in complementing existing healthcare services by empowering patients to take a more active role in managing their medications. The results also highlight the importance of culturally responsive healthcare interventions, accentuated by the fact that research around polypharmacy has tended to focus on ethnicity or age-related differences and failed to account for the intersectionality of the two [16]. Tailoring interventions to reflect language needs, cultural contexts, and community perspectives may improve engagement and acceptability among ethnically diverse populations, thereby helping to address existing health inequities in medication related outcomes [15].

Future research should build on these findings by evaluating the effectiveness of the 'I manage my meds' toolkit in larger and differing sociodemographic populations. Studies could examine whether the intervention improves outcomes such as medication adherence, medication safety, or patient confidence in medicines management. Qualitative research may also provide deeper insight into the cultural, social, and contextual factors that influence how older adults from different backgrounds perceive and use medicines management resources.

Conclusion

This study evaluated the acceptability of the 'I manage my meds' toolkit among older adults managing polypharmacy within their homes. The findings demonstrate that the toolkit was generally well received by participants, with high levels of acceptability across most domains of the TFA. Participants reported that the toolkit was easy to understand and use, highlighting its potential as a practical resource for supporting medicines management among older adults.

A key contribution of this study is the demonstration that culturally adapted health interventions may improve engagement among ethnically diverse populations. Participants from a South Asian background reported significantly higher acceptability across several domains, suggesting that the cultural and linguistic adaptation of the toolkit enhanced its perceived relevance and usefulness. These findings reinforce the importance of designing healthcare interventions that reflect the needs and contexts of diverse communities.

The study also highlights the value of involving community researchers in health research, as this approach may strengthen engagement with participants and support the development of more inclusive interventions. Further research is needed to evaluate the effectiveness of the toolkit in improving medication adherence, safety, and confidence in medicines management across broader populations of older adults.

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Author contributions

Edmund Breckin (Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Writing—original draft, Writing—review & editing), Raabia Sattar (Conceptualization, Data curation, Methodology, Project administration, Writing—original draft, Writing—review & editing), Charles Vincent (Conceptualization, Writing—original draft, Writing—review & editing), Nazreen Butt (Data curation, Project administration, Writing—review & editing), and Beth Fylan (Conceptualization, Funding acquisition, Supervision, Validation, Writing—review & editing). Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Supplementary material

Supplementary material is available at *Journal of Pharmacy Practice* online.

Conflicts of interest

Authors collaborated in formulating the concept and methods for the study. E.B., R.S., N.B. analysed and interpreted the data. All authors contributed to drafting and reviewing the manuscript before submission.

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Data availability

Data access requests will be considered by B.F. Send email with reasons for the request.

Ethical approval

The study was approved by The University of Bradford Research Ethics Committee on 19/02/2024 and the approval number is E1165. The Health Research Authority on 21/03/2024 and the approval number is 24/HRA/0645.

Data access statement

E.B. had full and current access to the study data.

References

1. Gnjidic D, Hilmer SN, Blyth FM *et al.* Polypharmacy cutoff and outcomes: five or more medicines were used to identify community-dwelling older men at risk of different adverse outcomes. *J Clin Epidemiol* 2012;65:989–95. https://doi.org/10.1016/j.jclinepi.2012.02.018
2. Fried TR, O'Leary J, Towle V *et al.* Health outcomes associated with polypharmacy in community-dwelling older adults: a systematic review. *J Am Geriatr Soc* 2014;62:2261–72. https://doi.org/10.1111/jgs.13153
3. Gao L, Maidment I, Matthews FE *et al.* Medication usage change in older people (65+) in England over 20 years: findings from CFAS I and CFAS II. *Age Ageing* 2018;47:220–5. https://doi.org/10.1093/ageing/afx158
4. Guthrie B, Makubate B, Hernandez-Santiago V *et al.* The rising tide of polypharmacy and drug-drug interactions: population database analysis 1995–2010. *BMC Med* 2015;13:74. https://doi.org/10.1186/s12916-015-0322-7
5. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. *Expert Opin Drug Saf* 2014;13:57–65. https://doi.org/10.1517/14740338.2013.827660
6. Lorenzini C, Giana. Managing multiple medications and their packaging for older people in home care nursing: an interview study. *Healthcare* 2021;9:1265. MDPI. https://doi.org/10.3390/healthcare9101265
7. Hilmer SN, Mager DE, Simonsick EM *et al.* Drug burden index score and functional decline in older people. *Am J Med* 2009;122:1142–1149.e2. https://doi.org/10.1016/j.amjmed.2009.02.021
8. Previdoli G, Silcock J, Alldred D *et al.* Co-designing an intervention to support safe medicines self-management for older people living with frailty and polypharmacy. *Int J Pharm Pract* 2023;31:i23–4. https://doi.org/10.1093/ijpp/riad021.026
9. Afolabi TE, Langford A, Hilmer SN *et al.* Development and evaluation of online medication support tools for older people: a systematic review. *Age Ageing* 2025;54:afaf303. https://doi.org/10.1093/ageing/afaf303
10. Fylan B, Tomlinson J, Raynor DK *et al.* Using experience-based co-design with patients, carers and healthcare professionals to develop theory-based interventions for safer medicines use. *Res Soc Adm Pharm* 2021;17:2127–35. https://doi.org/10.1016/j.sapharm.2021.06.004
11. van Gemert-Pijnen JEWC, Nijland N, Van Limburg M *et al.* A holistic framework to improve the uptake and impact of eHealth technologies. *J Med Internet Res* 2011;13:e1672. https://doi.org/10.2196/jmir.1672
12. O'Cathain A, Croot L, Sworn K *et al.* Taxonomy of approaches to developing interventions to improve health: a systematic methods overview. *Pilot Feasibility Stud* 2019;5:41. https://doi.org/10.1186/s40814-019-0425-6
13. Glowacki K, Zumrawi D, Michalak E *et al.* Evaluation of health care providers' use of the 'Exercise and Depression Toolkit': a case study. *BMC psychiatry* 2021;21:243. https://doi.org/10.1186/s12888-021-03248-5
14. Sekhon M, Cartwright M, Francis JJ. Acceptability of healthcare interventions: an overview of reviews and development of a theoretical framework. *BMC Health Serv Res* 2017;17:88. https://doi.org/10.1186/s12913-017-2031-8
15. Secchi A, Booth A, Maidment I *et al.* Medication management in M minority, Asian and Black ethnic older people in the United Kingdom: a mixed-studies systematic review. *J Clin Pharm Ther* 2022;47:1322–36. https://doi.org/10.1111/jcpt.13735
16. Assari S, Bazargan M. Race/ethnicity, socioeconomic status, and polypharmacy among older Americans. *Pharmacy* 2019;7:41. https://doi.org/10.3390/pharmacy7020041
17. Asiri R, Robinson-Barella A, Iqbal A *et al.* Understanding the influence of ethnicity on adherence to antidiabetic medication: Meta-ethnography and systematic review. *PLoS One* 2023;18:e0292581. https://doi.org/10.1371/journal.pone.0292581
18. Guta A, Flicker S, Roche B. Governing through community allegiance: a qualitative examination of peer research in community-based participatory research. *Crit Public Health* 2013;23:432–51. https://doi.org/10.1080/09581596.2012.761675
19. Southby K, Coan S, Rushworth S *et al.* The contribution of peer research in evaluating complex public health interventions: examples from two UK community empowerment projects. *BMC Public Health* 2022;22:2164. https://doi.org/10.1186/s12889-022-14465-2
20. City of Bradford Metropolitan District Council. *A Profile of Bradford District 2025*. Bradford Council: Bradford, 2025.
21. Sim J, Lewis M. The size of a pilot study for a clinical trial should be calculated in relation to considerations of precision and efficiency. *J Clin Epidemiol* 2012;65:301–8. https://doi.org/10.1016/j.jclinepi.2011.07.011
22. Sekhon M, Cartwright M, Francis JJ. Development of a theory-informed questionnaire to assess the acceptability of healthcare interventions. *BMC Health Serv Res* 22:279. https://doi.org/10.1186/s12913-022-07577-3
23. Breckin E, Sattar R, Butt N *et al.* Cultural adaptations of healthcare interventions: a step-by-step guide. *Health Expect* 2026;29:e70639. https://doi.org/10.1111/hex.70639
24. Costello AB, Osborne J. Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract Assess Res Eval* 2005;10:1–9.

25. Fayers PM. The scales were highly correlated: P = 0.0001. *Qual Life Res* 2008;17:651–2. https://doi.org/10.1007/s11136-008-9351-4
26. Alhomoud F, Dhillon S, Aslanpour Z *et al.* Medicine use and medicine-related problems experienced by ethnic minority patients in the United Kingdom: a review. *Int J Pharm Pract* 2013;21:277–87. https://doi.org/10.1111/ijpp.12007
27. der Gaag V, Marieke MH, Ballester M *et al.* Preferences regarding self-management intervention outcomes of Dutch chronically ill patients with limited health literacy. *Front Public Health* 2022;10:842462. https://doi.org/10.3389/fpubh.2022.842462
28. Michael SS, Babu KM, Jr CA *et al.* Effect of a data-driven intervention on opioid prescribing intensity among emergency department providers: a randomized controlled trial. *Acad Emerg Med* 2018;25:482–93. https://doi.org/10.1111/acem.13400

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