Implementation of the PrAISED (Promoting Activity, Independence and Stability in Early Dementia) intervention in practice: a mixed methods study

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Abstract

There is a paucity of evidence relating to the implementation of dementia care. The Promoting Activity, Independence and Stability in Early Dementia (PrAISED) intervention is a newly developed 12-month, home-based, individually tailored rehabilitation programme, delivered by therapists and rehabilitation support workers, with a focus on strength, balance, physical activity and activities of daily living. The aim of this study was to identify what is required to implement PrAISED, or similar interventions, in routine clinical practice. PrAISED was delivered as a pilot service in one National Health Service organisation in England. Patient characteristics and the number and duration of visits were recorded by intervention delivery staff. Quantitative data were explored using descriptive statistics. Semi-structured interviews were conducted with seven members of staff delivering the PrAISED service (two managers, five delivery staff) and eight members of staff from other sites involved in the PrAISED Randomised Controlled Trial (RCT) (four managers, four delivery staff). The Consolidated Framework for Implementation Research was used to inform interview guides and conduct a codebook thematic analysis. Adaptations were needed to deliver PrAISED as a service and referrals were lower than expected. Five themes were identified from interviews relating to the pilot service: operational processes; workforce capacity; referral; intervention delivery and patient impact. A further six themes were identified regarding the wider implementation of dementia therapy programmes: the need for support post-dementia diagnosis; acceptability; effective delivery; reach/referral; intervention design and adaptability; and intervention materials and training. There is a need for interventions like PrAISED to fill a gap in support immediately post-dementia diagnosis. Future implementation will require attention to the identification of intervention funding; leadership and management; time to establish operational processes; therapists with appropriate skills and experience; providing training and resources to support intervention delivery; defining patient eligibility and referral processes; and maintaining fidelity of the intervention.

Keywords: dementia; mild cognitive impairment; rehabilitation; implementation; knowledge translation

Introduction

Globally, more than 55 million people have dementia which will rise to over 150 million by 2050 (Nichols, 2022; World Health Organisation, 2023). In the United Kingdom (UK), over 900,000 people are living with dementia (NHS England, 2023) and the total cost of dementia care is estimated to be £34.7 billion (Wittenberg et al., 2019), placing a significant burden on the economy and health and social care services. Dementia is a neurodegenerative condition associated with loss of memory and executive function, and changes in behaviour and mood (Alzheimer's Society, 2021). Mild Cognitive Impairment (MCI) is also a syndrome of impaired cognition, with retained everyday functioning, which presents a significant risk for progression to dementia (Gauthier et al., 2006). Impaired functioning in dementia may be a result of cognitive impairment, but also physical impairment such as abnormal or impaired gait (Kearney et al., 2013; Taylor et al., 2019), or co-morbidities. Exercise and activity interventions involving strength and balance training and functional tasks, in particular dual-tasking, may improve physical ability and everyday functioning (Booth et al., 2016; Clemson et al., 2012; Graff et al., 2006; Law et al., 2014; Pitkala et al., 2013; Silsupadol et al., 2009). Intervening early, taking a preventive approach, and tailoring interventions to individual needs may be particularly effective (Booth et al., 2018).

The World Health Organization has emphasized the need for evidence-based interventions to enable people with dementia to live in the community and receive tailored care (World Health Organisation, 2017). However, it takes on average 17 years for an effective intervention to be integrated and implemented in practice (Morris et al., 2011) and there is a paucity in evidence relating to the implementation of evidence-based dementia care (Lourida et al., 2017). Thus, there is a need to evaluate the implementation of interventions for dementia care in practice to support rapid dissemination and scaling up of these types of intervention.

The PrAISED (Promoting Activity, Independence and Stability in Early Dementia) intervention is a 12-month, home-based, individually tailored rehabilitation programme for patients with early dementia

or MCI, delivered by therapists and rehabilitation support workers, with a focus on strength, balance, physical activity and activities of daily living (Booth et al., 2018). A feasibility trial with 60 participants showed that the intervention could be delivered, participants successfully recruited and followed up, and statistically significant benefits were observed on balance and mobility outcomes (Goldberg et al., 2019). A return on investment analysis showed that the intervention is likely to be good value for money (Hartfiel et al., 2022). A larger scale randomised controlled trial (RCT) to test the effectiveness and cost-effectiveness of the intervention, along with a comprehensive process evaluation, has been conducted (Bajwa et al., 2019; Di Lorito et al., 2020; Di Lorito et al., 2019). The PrAISED research programme anticipated post-trial adoption and implementation throughout, by co-producing the intervention with health professionals, patients and their families (Burgon et al., 2019; Peach et al., 2017; van der Wardt et al., 2020), using health service staff rather than research staff to deliver the intervention, creating training and support resources, and by studying fidelity, adaptation and reach in a process evaluation (Di Lorito et al., 2019; Hancox et al., 2019). However, the challenges of the "implementation gap" are recognised along with the need to ensure the benefits for patients and healthcare services are realised widely and quickly after completion of the research.

The aim of this study was to identify what is required to implement the PrAISED intervention in routine clinical practice. The objectives were to 1) deliver and characterise the reach and implementation of a PrAISED pilot service in one National Health Service (NHS) organisation in England; 2) explore staff perceptions of the implementation of the service; and 3) identify the factors which might influence the implementation of dementia care interventions like PrAISED in practice in the future.

Methods

Theoretical framework

The "Consolidated Framework for Implementation Research" (CFIR) (Damschroder et al., 2009) was used in this study. The CFIR posits that the factors affecting implementation can be related to five

domains including the "intervention characteristics (innovation)", the "inner setting", the "outer setting", "individual characteristics" and "process". Across the five domains, 39 constructs have been associated with effective implementation (Damschroder et al., 2009). Domain definitions and how they map to the PrAISED intervention are shown in Table 1.

Table 1. Consolidated Framework for Implementation Research (CFIR) domains mapped to PrAISED

CFIR Domains*	**Definition***	**PrAISED**
I. Intervention characteristics	The intervention being implemented	The PrAISED intervention (a 12 month individually tailored and progressive rehabilitation programme, focussing on strength, balance, physical activity and performance of activities of daily living)
II. Outer setting	The setting in which the inner setting exists	Wider NHS trust; Health and Social Care services; Integrated Care Systems; county level health and social care; public health planning at local/regional/national level; NHS England; macro level organisation e.g., government
III. Inner setting	The setting in which the intervention is delivered	PrAISED is delivered within the community element of Mental Health Services for Older People
IV. Individual characteristics	The roles and characteristics of individuals	Staff delivering the intervention (e.g., physiotherapists, occupational therapists (OT), rehabilitation support workers, OT assistants); staff managing the intervention; planners, commissioners, providers and stakeholders
V. Process	The activities and strategies used to implement the innovation	Planning processes of implementing and commissioning (PrAISED and more general dementia friendly, physical activity interventions) including key stakeholders at staff and organisational level, people and organisations to engage with, the 'doing' of the implementation, and any references to reflecting and evaluating the implementation and/or commissioning.

* From CFIR version 1 (Damschroder et al., 2009)

Description of PrAISED (the intervention/innovation)

In brief, the intervention is a 12-month, individually tailored therapeutic programme of physical exercises, such as strength and balance training, and functional activity training, that aims to promote inclusion in everyday life and the community (Booth et al., 2018). The intervention is delivered by physiotherapists, occupational therapists, and rehabilitation support workers. In the RCT, individuals in the intervention group could receive up to 50 supervised sessions over the 12 months (Bajwa et al., 2019).

Implementation of a pilot service

One of the five sites which took part in the PrAISED RCT was recruited to deliver a pilot service from 1st April 2022 to 30th November 2022. Two physiotherapists, two occupational therapists and three rehabilitation support workers were employed part-time to deliver the service. One physiotherapist, one occupational therapist and one rehabilitation support worker were involved in both the RCT and the pilot service. The other pilot staff members were new to PrAISED and received a shortened version of the PrAISED training delivered by the research team. The therapy team were encouraged to take ownership of the intervention and make changes as necessary to deliver it as a service but were able to seek advice from the research team if required. The aim was to refer 20 patients to the service. Due to project timelines, the pilot service comprised a 6-month PrAISED intervention.

Study design

A mixed methods study was conducted which included analysis of routine data collected by the pilot service; one-to-one interviews with staff involved in delivering the intervention in the pilot service and one-to-one interviews with staff involved in delivery at the other PrAISED RCT sites.

Data collection

Analysis of routine data

Routinely collected data from the pilot service were recorded on a Microsoft Excel spreadsheet by staff delivering the intervention. Patient characteristics including gender, age, ethnicity, status in service (active, completed, withdrawn), reason for withdrawal (where applicable), age left school, estimated ability at school, further education and difficulty reading/writing were recorded, along with the total number of therapy visits and the date and duration of each visit. After the last patient's final visit, the spreadsheet was anonymised, password protected and sent to the research team for analysis.

Qualitative Interviews

Face-to-face semi-structured interviews were conducted online with individuals who were responsible for the management or delivery of the intervention at the pilot service site, or in the other four PrAISED RCT study sites. Four semi-structured interview topic guides (Supplementary File 1) were developed to reflect each type of interview (therapist/rehabilitation support worker or manager, and pilot or non-pilot site), which were guided by the CFIR (Damschroder 2009).

Clinical managers, therapists, and rehabilitation support workers at the pilot service site, and at the four other sites, were invited to take part in an interview via email. Participants received an information sheet prior to the interview and gave explicit written or verbal consent. Staff from non-pilot sites were interviewed between August and September 2022; interviews with pilot site staff were conducted between October and November 2022. Interviews were conducted via Microsoft Teams and were recorded. On average, interviews lasted 49 minutes (range 29-81 minutes). Transcripts were produced using automatic transcription and were checked for accuracy.

Data analysis

Analysis of routine data

Descriptive analysis of anonymised routine data collected in the pilot service was conducted using Microsoft Excel to summarise patient characteristics and therapy visits.

Qualitative Interviews

A thematic analysis (Braun et al., 2019) was undertaken using a pre-determined CFIR codebook to guide the analysis (CFIR Guide, 2023). The analysis was conducted in NVIVO (QSR International Pty Ltd, 2020). Transcripts were read and re-read by two researchers (CB & JL) to aid familiarisation with the data. Initial coding was conducted by applying the CFIR codes to each transcript. Notes were made on the transcripts to justify coding decisions. EA checked coding throughout to facilitate a consistent application of CFIR. Regular weekly meetings were held with the wider team (CB, JL, EA, RV, RT) to discuss coding and emerging insights. Potential themes and subthemes were discussed and revised iteratively to produce a final set of themes relating to each of the CFIR domains. During our study, an updated version of the CFIR was published (Damschroder et al., 2022). We included new or revised construct definitions where these were deemed relevant to our study.

Results

Pilot PrAISED service

Referrals were made to the pilot service from the Memory Assessment Service (MAS). Adaptations were made to deliver the PrAISED intervention as a service. Research inclusion criteria and research processes, such as using patient information sheets and consent forms, and baseline and follow-up neuropsychological tests were removed, though the requirement for individuals to have a family member or friend to support them was retained. Clinical assessments were conducted as per usual practice. A service leaflet was developed and provided to patients. The requirement for communication in English was removed as the service leaflet was made available in multiple languages and interpreters were available to support service delivery. The visit schedule and patient activities were adapted as the clinical team deemed necessary to reflect the shortened 6-month intervention whilst following the principles of the PrAISED intervention.

Eleven patients were referred to the service (55% male; mean age 78, range 68-85; 91% white British; mean age leaving school 16 (range 15-18)). Patients self-reported estimated ability at school: above average n=4;

average n=6; below average n=1; 27% attended further education; and 91% had no difficulty reading/writing. Staff delivered 230 visits in total (mean 21 visits per participant, range 5-38) with a mean visit duration of 82 mins (mean range 68 to 91 minutes). The overall dose of intervention varied depending on when the participant was recruited: eight participants received six months intervention, one participant received five months and two participants received four months intervention.

Seven interviews were conducted with staff from the pilot service (two managers, two physiotherapists, two occupational therapists and one rehabilitation support worker). Five themes were identified across seven CFIR constructs (Table 2): operational processes; workforce capacity; referral; intervention delivery; and patient impact.

Operational processes

Findings from the interviews suggested that establishing operational processes for the pilot service was more complicated and took longer than in the RCT requiring buy-in and approvals from the wider organisation.

Workforce capacity

Scheduling multiple therapy sessions at a time acceptable to patients, and communicating between a multi-professional team, in the face of competing demands on time and part-time working, was challenging. However, recruiting lower numbers of participants than expected made it more manageable for the small team employed to deliver the service.

> *"Everybody's trying to do it as part and parcel of something else that we're doing, so we had to work quite hard at staying in touch with each other. So that's been a bit of a challenge."* (Occupational Therapist)

Table 2. CFIR Domains and constructs associated with themes in the Pilot Service

Theme	CFIR Domain*	CFIR Constructs*	Key points
Operational processes	III. Inner setting	A3. Work infrastructure	• Operational processes took much longer to establish in the pilot service
Workforce capacity	III. Inner setting	E2. Available resources	• Small, part-time team, working on PrAISED alongside normal clinical role, made it challenging to meet the needs of the service
Referral	V. Process	B2. Innovation recipients	• There were challenges with referrals to the service • Influenced by the short time frame for the pilot service • Potential difficulties engaging the referral team / challenges with duration of appointments to cover all services available to patients • The timing of referrals may have impacted patient engagement; some patients needed more time to come to terms with their dementia diagnosis and may have started PrAISED at a later date
Intervention delivery	I. Intervention characteristics	D. Adaptability	• Pilot service was more like normal practice, with a shorter intervention and more flexibility for patients to join and leave the service
	V. Process	C. Executing/ doing	• There was flexibility in delivering the service, whilst retaining the PrAISED intervention principles • It was challenging to fit in the visits in the shorter time frame • Time constraints made it difficult to build rapport with patients; and led to a change in focus of activities/visits • Less focus on rehabilitation and more on risk assessment/management, quick strategies, and physical elements/exercises • Goal setting continued, but these had to be prioritised; it was harder for patients to achieve goals in the shorter time frame • Less use of dual tasking elements / used more towards the end of the service • Lack of time to taper visits, more reliance on written materials and signposting to other services • Dependence on referral to other services for sustainability
Patient impact	II. Outer setting	A. Needs & resources of those served by the organisation	• The service was well received by patients, with most providing positive feedback as to perceived improvements in confidence, motivation, balance and strength, and reduced loneliness
	V. Processes	D2. Reflecting and evaluating – intervention	

* From CFIR version 1 (Damschroder et al., 2009)

Referral

The pilot service did not recruit its target number of participants. Referral to the service was thought to be challenging due to the nature of the pilot service (short-term and temporary, so there was no time or incentive to embed processes in clinical activities); high turnover in the MAS referral team; and keeping staff up to date with the rapidly changing services available.

> *"I was surprised we didn't get more referrals. But I think it's interesting to hear from some of the other studies that's quite normal, and it's a reflection of staff on the ground, those referring in, to get their head around a new offer or a new service."* (Manager)

In addition, the referral team had time constraints during appointments with newly diagnosed patients, and there was a large amount of information about services and research studies they could potentially cover alongside conducting assessments and providing a diagnosis. This was thought to make it difficult to always include PrAISED in the discussions.

> *"Some of the people that recruited have worked in the MAS service and were very proactive, really understood the study and were really effective about recruiting, whereas other staff, I think they get so many studies and requests for a memory assessment, and also the time that they've got to interview people and talk about everything is really short."* (Manager)

Furthermore, the volume of information for patients to take in at the point of diagnosis was also thought to be a challenge and might have influenced patient's decisions as to whether to take part in the PrAISED service.

> *"They'll [the patients] have come home with 'What is Alzheimer's disease? What is this? What is …, you know? If I need some advice about my …, I've got all these bits of paper. I've just been given a diagnosis.' It's almost too much to take on at that point in time."* (Manager)

Intervention delivery

Interviewees felt the pilot service was more like normal practice, but there was more flexibility than in the RCT in the number, duration and frequency of visits with participants.

"I think every visit is very unique for every person. Sometimes a visit can take 40 minutes, sometimes if the individual is struggling, you do tend to give them a little bit more time. So, I think having that flexibility has been incredible because there's no set time of going between visits." (Physiotherapist)

There was also more flexibility in timing for participants to join the service or to leave the service if there was a lack of engagement or motivation or the service wasn't thought to be right for the patient.

"We said, 'Okay well, now this isn't useful for you' so we've signposted to where we felt was better for that person. We felt like she needed a care package in the end, and that was more what her needs were." (Rehabilitation Support Worker)

Staff reported finding the shortened duration of the intervention challenging. It impacted on fitting the visits in and delivering such an intensive intervention, though staff reported they continued to follow the principles of PrAISED in delivering intervention activities.

"Everything has been halved in terms of the usual number of contacts that we were able to have within a year. I know we've struggled to get the amount of RSW [Rehabilitation Support Worker] visits in. There's been no change to the focus of the interventions that we've been we've been doing, but we've had some time constraints in terms of being able to do things as thoroughly as we were able to do when we had a whole year to work with people." (Occupational Therapist)

The shorter duration of the pilot service intervention changed the focus of visits. There was less time to build rapport with patients, complete assessments and set goals, but staff used their skills and experience to innovate and adapt delivery of the intervention. There was less focus on rehabilitation activities and more risk assessment/management, providing written materials, quick strategies such as physical elements/exercises and signposting to other services to provide long-term support.

"It takes time to build up rapport with somebody, to do your assessments, to plan goals, to see what things they value, and I think that's been much quicker, and I think there's been less actual rehabilitation and a little bit more signposting earlier on, when they haven't had the benefit of the actual rehabilitation intervention." (Manager)

Interviewees reported that goal setting continued, but these had to be prioritised due to the shorter time frame and it was harder to achieve goals in the time available.

> *"I think with the… study [RCT], because we could work with people for a year, one of the key things that is really important is being able to negotiate and set goals with participants and ask 'What do you want to achieve?' and usually the participant will say, 'Well, I want to achieve this within a year'. With this [the pilot service], we're trying to help somebody set goals that are a bit shorter because you've only got three to six months to work with somebody."* (Occupational Therapist)

One of the key elements of PrAISED was to build in dual tasking and apply this to the exercise programme adapting it to the needs and abilities of the patient. There was less use of dual tasking activities in the pilot service, or these were used more towards the end of the intervention.

> *"Mostly towards the end of the contact time with somebody, I've been able to start building in dual tasking, because we've been working on other things that have been more of a priority. So, the dual tasking element probably slipped a little bit in terms of when we've been able to bring that into the programme."* (Occupational Therapist)

Staff delivering the interventions recognised the importance of the tapering and ensuring the patients did not become dependent on them, however they found it much more difficult to do this within the shorter time frame of the pilot service.

> *"I think the tailing off part is really important because you do develop that relationship with the individual and because you are there supporting them through a time which is very difficult, and I can imagine quite scary as well for them. So, that tailing off period is very important."* (Physiotherapist)

Due to time constraints in the pilot service, there was more dependence on signposting, provision of materials and referral to other services to support activities and delivery of the intervention, and for sustainability beyond the end of the service.

> *"We've been trying to make sure we're leaving people with as many resources, psychologically and practically, to be able to carry on when we're not there. So, we've tried very much to link them in with*

other community resources and community services that are going on that they can access."

(Occupational Therapist)

Patient impact

Staff perceived there were benefits to participants from the intervention. They reported the service was well received by patients, and it made them feel valued with most providing positive feedback and reporting to therapists perceived improvements in confidence, motivation, balance and strength and reductions in loneliness.

Factors influencing the implementation of PrAISED in practice

A further eight interviews were conducted with staff from across four non-pilot sites (two per site, one manager and one member of intervention delivery staff) which were combined with the pilot service interviews to identify themes related to wider implementation. Nine participants were therapists or rehabilitation support workers and six were managers. From these fifteen interviews, six themes relating to implementation issues were identified across twenty-two CFIR domains (Table 3): the need for support post-dementia diagnosis; acceptability; effective delivery; reach/referral; intervention design and adaptability; and intervention materials and training.

The need for support post-dementia diagnosis

Interviewees thought PrAISED fills a gap immediately post-diagnosis, and promotes a positive approach, highlighting what patients can still do and working towards bigger goals at a difficult time after receiving a diagnosis. It provides a tailored, holistic and preventive approach for patients with dementia, intervening at an early stage in a patient's diagnosis. This contrasts normal services which are typically more reactive and get involved when a patient reaches crisis point.

"It's just so evident there's a gaping hole, and it is at the most valuable time to engage with people and to have that dialogue with individuals when they have capacity to do so, because often by the time CMHT [Community Mental Health Team] get involved, people will have limited capacity and difficulties consenting to decisions." (Occupational Therapist)

Table 3. CFIR Domains and constructs associated with themes for PrAISED implementation

Theme	CFIR Domain*	CFIR Constructs*	Key points
The need for support post-dementia diagnosis	II. Outer setting	A. Needs and resources of those served by the organisation	• PrAISED fills a post-diagnostic gap and promotes a positive approach, highlighting what patients can still do at a difficult time after diagnosis • Provides a holistic approach
	III. Inner setting	D1 Implementation climate – tension for change	• Preventive rather than reactive • Home-based intervention is important - Access to services (costs/transport) - Identifying risks/issues in home environment to prevent deterioration
	V. Processes	E2. Assessing needs – intervention recipients	• More than medication, addresses patient individual needs and interests
Acceptability	IV. Characteristics of individuals	1. Knowledge and beliefs about the intervention	• Staff enjoyed delivering PrAISED in the pilot service and the RCT and liked being involved at the start of the patient's dementia journey • More the type of rehabilitation work expected
	V. Processes	D1. Reflecting & evaluating - Implementation	• Longer duration of intervention is better for supporting patients/impact • Important for prevention of deterioration • Patient has positive focus/point of contact • Patients like the intervention
	I. Intervention characteristics	F. Complexity	• PrAISED is complex for management, staff delivering the intervention and patients
	I. Intervention characteristics	H. Costs	• Challenging to deliver a 12 month intervention in practice due to costs, staff availability and intervention intensity
	III. Inner setting	E2. Readiness for implementation - available resources	• Different funding models and intervention delivery models might need to be considered • Challenges due to changes in healthcare structures and targets, and availability of policy guidance
	II. Outer setting	D. External policy and incentives	
Effective delivery	IV. Characteristics of individuals	5. Other personal attributes	*Sub-theme: Skills and experience of staff* • Delivery by health professionals important for cross referrals to other services and clinical skills • Using a range of health professionals provided expertise and experience to treat patients holistically
	V. Process	B1. Engaging – intervention deliverers	• Experience of dementia and community physical and mental health is important
		E1. Assessing needs – intervention deliverers	• Staff need to have skills in communication, empathy, listening, patience, creativity, adaptability, resilience, and relationship building • Ongoing training to support intervention delivery is essential • Engaging staff to help deliver the intervention can be challenging and takes time
	V. Processes	B3. Engaging - Champions	*Sub-theme: Leadership, management support and team working* • An organisational champion is important for leadership of the intervention
	III. Inner setting	A3. Work infrastructure	• Management support, co-ordination and supervision facilitated delivery
		B. Networks and communication	• Oversight of visit planning was needed and prompting to ensure principles followed • This supported intervention fidelity and provided quality control

			• Teamwork was critical for intervention delivery
	III. Inner setting	A3. Work infrastructure	*Sub-theme: Communication and sharing knowledge*
			• Communication is essential for intervention delivery
		A2. IT infrastructure	• Sharing team knowledge and drawing on knowledge across the therapist network is important for developing collective resources and activity ideas
		B. Networks and communication	• A digital system and access to patient medical records would help managing patient visits and delivery of a coherent intervention
Reach/referral	III. Inner setting	D2. Implementation climate – compatibility	• PrAISED participants were not typical of those seen in normal services who are usually more unwell
			• Eligibility criteria may need reconsideration to reach those who will benefit most
	V. Process	E2. Assessing needs – intervention recipients	• The timing of referral may need reconsideration, some thought it was too much for patients at time of their dementia diagnosis
	V. Process	B2. Engaging – intervention recipients	
	V. Process	B1. Engaging – intervention deliverers	• Memory Assessment Services may not have capacity to cover all services/offers
			• The referral process in MAS could be amended, or the point of referral could be broadened to GPs and other services/clinics or self-referral
Intervention design and adaptability	I. Intervention characteristics	D. Adaptability	• The 12 month intervention duration is 'nice to do' but not typical of normal practice
			• Staff valued having this length of time with patients
	III. Inner setting	D2. Implementation climate – compatibility	• There was uncertainty as to where PrAISED would fit in clinical pathway
			• Flexibility with the number of visits and types of activities delivered along with the tailored approach in PrAISED was important
	IV. Individual characteristics	1. Knowledge and beliefs about the intervention	• Getting to know patients, their lifestyle, and what they enjoy is helpful to link with exercises
	V. Processes	B2. Engaging - intervention recipients	
	V. Processes	E2. Assessing needs – intervention recipients	
Intervention materials and training	I. Intervention characteristics	G. Design and packaging	• Intervention materials are important
			• Intervention manual and patient home file was useful
	III. Inner setting	E2.3 Readiness for implementation - available resources/ materials & equipment	• Equipment is needed for the intervention exercises, but also equipment to support patients in other ways
			• Developing a central resource folder for signposting to other services and activities and drawing on therapists' local knowledge is useful
		E3 Readiness for implementation – access to knowledge and information	
	III. Inner setting	E3 Readiness for implementation – access to knowledge and information	• Training is needed initially and on an ongoing basis to maintain intervention fidelity

* From CFIR version 1 (Damschroder et al., 2009)

The home-based nature of PrAISED was thought to be important in reducing issues related to accessing services. For example, some patients can't travel to venues for sessions due to costs and availability of transport, potentially widening health inequalities. Interviewees also felt the home-based nature of the PrAISED intervention was important because it enabled them to identify risks or issues for patients in their home environment that might not be observed in a clinical setting, or until a later stage when the patient had deteriorated.

> *"This programme is all about really seeing somebody in their home environment and looking at the risks and looking at their challenges and sometimes you can notice things around the home that you can build into the programme."* (Occupational Therapist)

Intervention delivery staff indicated they want to be able to offer patients more than medication, and to have the time and flexibility to work with patients, tailoring the number of visits and the activities chosen to meet the needs and interests of the patient with dementia to enable them to participate, and motivate them to do the activities. PrAISED provided this opportunity.

Acceptability of PrAISED

Staff enjoyed delivering PrAISED therapy and thought it was more the type of rehabilitation work they expected to do when they trained as therapists. They liked being involved at the start of a patient's dementia journey and seeing the impact it had.

> *"It's really a privilege to do as a therapist because you've got time to really get to know the person and explore their individualised needs. You've got time to adapt it and change it and you know that's not something I often get in any other role of therapy. It's lovely from a therapy delivery point of view, but also, it's lovely seeing the difference that makes to people." (Physiotherapist)*

Interviewees believed that early intervention immediately post-diagnosis and a sufficiently long duration of intervention was important for supporting participants, helping them achieve their goals, preventing deterioration and increasing the intervention impact, giving participants a positive focus and a point of contact. There was a perception that patients also liked the intervention.

"What I'm hearing from the individuals and from their carers is that PrAISED provides hope and it's a real positive part of their journey because we're looking at positive things with them. We're concentrating on what they can do, not what they can't do, and we're concentrating on where they want to go, and they can see that there's a progression in a positive way that it isn't just about deterioration. But what PrAISED is really good about, is highlighting what are the small achievable goals and even bigger goals that you can continue to strive towards, and that there are ways around problems. It seems just the perfect time really to capture those people." (Occupational Therapist)

In contrast, there was also some perception that the PrAISED intervention is complex which may impact on future implementation. This was due to the referral process, the number of different staff involved, the number and varying nature of patient visits, the management input required to ensure visits are being undertaken, and making sure patients adhere to the intervention. In addition, it was thought to be complex for patients due to interchangeable use of terminology, e.g., goals/aims or exercise/activities, and setting goals and using dual tasking; and this might need to be simplified in future.

It was thought it would be challenging to deliver a 12-month intervention in practice due to costs, staff availability, and the intensity of the intervention (up to 50 visits), and interviewees were uncertain how this could be funded. Interviewees thought different funding models and different ways of delivering the intervention would need to be considered. For example, how to train staff; how to maximise the use of different types of staff (e.g., occupational therapists, physiotherapists and rehabilitation support workers) with different skills cost effectively; how to reduce the costs of travel to patient's homes (whether some of the intervention could be delivered remotely); and whether a more flexible budget could be provided that could be used as needed for patient resources and equipment. It was suggested that some investment would be needed initially to support developing and establishing the intervention as a service.

"I think internally it will be very difficult until things got established. It needs pump priming because I think some of our resources could be used in a different way. But until you invest in it, you can't release those resources. It needs some sort of investment to start and to get some committed staff

time to deliver the intervention, as it's supposed to be delivered and not a watered down version."

(Manager)

Furthermore, it was thought that recent changes in the health service structure in England, particularly in the way services are commissioned, along with regular changes in initiatives and targets, the need for evidence of effectiveness and cost-effectiveness, and uncertainties of where dementia services sit within the NHS may make it challenging to embed PrAISED into practice at present.

Effective delivery

Three key areas were identified in relation to effective delivery including the skills and experience of staff; management support and team working; and communication and sharing knowledge.

- *Skills and experience of staff*

Interviewees thought PrAISED should be delivered by health professionals. They have the clinical skills needed to work with patients with dementia so can address other medical issues and have awareness of patient safety and knowledge of additional services where patients can be referred to if other types of support are needed. This contrasts with the views of commissioners and other key stakeholders' who thought that non-health professionals, such as exercise professionals, could also potentially deliver the intervention to increase the workforce capacity (Tucker et al., 2023). Having a range of health professionals with different areas of expertise was thought to be important as it enabled the team to have wide-ranging and comprehensive knowledge and experience to ensure patients were treated holistically.

It was thought that staff delivering the intervention should have experience of dementia and of community physical and mental health, as they complement each other and enable more comprehensive approach to treatment. Having skills in communication, empathy, listening, patience, creativity, adaptability, resilience, and relationship building were thought to be essential, along with ongoing training and shadowing/supervision of sessions for staff delivering the intervention.

"It would be useful to have some experience of working with dementia and possibly useful to have some experience working in the community as well, and those people skills, listening and trying to understand, being empathetic." (Physiotherapist)

Furthermore, interviewees reported that engaging staff to help deliver the intervention can take considerable time. Having good links with the correct services and providing reassurance to potential intervention delivery staff regarding workload, protected time, support and training is needed. Having sufficient staff capacity to deliver the intervention to many patients simultaneously was thought to be one of the main barriers for delivery.

"It takes a lot of time to engage clinicians, letting them know that they have got us for support and that it's all about their protected time. There was lots of reassurance." (Manager)

- Leadership, management support and team working

Leadership, management support, co-ordination and supervision along with team working and regular communication was a facilitator in delivering PrAISED. Having a champion within the organisation who could lead and promote the intervention, obtain approvals and ensure the quality of the intervention delivery was critical.

"You need to find one good person to take up your cause within the department, that has good relationships with everybody and can see the benefit of the intervention. You really need that one champion initially, who can bring people on board and help you." (Therapist)

It was important for management to oversee visit planning to ensure visits had been completed in the correct timeframes, and to prompt staff regarding use of the intervention manual to ensure the PrAISED principles were followed to support intervention fidelity and provide additional support for intervention quality control.

"It needs management. It needs somebody supervising that the visits are being taken as per the schedule and that they are time effective as well." (Occupational Therapist)

A collaborative relationship between the occupational therapists, physiotherapists and rehabilitation support workers, who jointly delivered the intervention, was important for planning visits, delivering sessions and monitoring patients' progress.

- Communication and sharing knowledge

Communication was essential for effective delivery of the intervention. This included team meetings to review cases, keeping an oversight of patient management and sharing strategies and ideas for activities; sharing knowledge and information about services and activities outside of PrAISED; communication to patients about their participation; and communication to general practitioners (family doctors) at the end of the intervention to share progress and a future action plan.

Using team knowledge, sharing ideas and drawing on knowledge across the therapist network (particularly if a therapist was working in a geographical area that was not familiar to them) was important for developing collective resources and pooling information about ideas for community activities for patients, along with services which were available where patients could be referred or signposted to support delivery of PrAISED and long-term participation beyond the end of the intervention.

> *"I think it worked well because the rehab worker lived in the area, she knew we don't live in the area, so we didn't know what was available, but she was brilliant, she knew loads so we were able to tap into her local knowledge."* (Occupational Therapist)

It was also suggested that digital systems would be useful for managing patient visits along with having access to patients' medical records, which was considered important to facilitate delivery of a coherent intervention across different members of the team and in collaboration with other services being offered to the patient.

> *"With [County1], we had no access to the electronic patient record system, which meant that for most of the referrals, we were working blind, we weren't able to read up on any previous medical history or previous mental health history, or even ongoing contact with services. In [County2], we've used [electronic patient record system] all the time and I have found that very helpful. I think it's really*

important that any new service has to be integrated, so staff can see the patient record."

(Occupational Therapist)

Reach/Referral

Interviewees thought patients in PrAISED were not the typical group of patients that would be seen and that usually patients would be seen when their disease had progressed more and were more unwell.

"They wouldn't meet the inclusion criteria; they'd be too high level and they'd be able to get to other services. So, it's a real privilege to be seeing people that are able to do such high level and quality of life intervention, but it wouldn't fit with the other service that I work in currently, we would not have the capacity to see people that were that able." (Physiotherapist)

It was suggested the eligibility could focus on need more, for example people who are less physically active, to reach those who will benefit most, along with some form of motivation assessment to ensure patients engage in the intervention.

"When we were doing PrAISED, we did get a number of people who were already quite active that didn't necessarily need as much intervention as they were already going to the gym four times a week. You're not going to refer somebody for a service that they don't need, are you? So, you would be checking their activity levels before the referral was made." (Manager)

There were mixed views about the timing of referrals to PrAISED. Some thought it was best to refer at the time of the diagnosis appointment when patients most needed support, whereas others thought it may have been too much for patients at this point. It was suggested that the referrals process is not currently designed with the patients' needs in mind and needs to be later in the pathway as the patient can be overwhelmed at their point of diagnosis.

There were also mixed views about the process of referrals to PrAISED. There were concerns that Memory Assessment Services (MAS) may not have capacity which may reduce referrals to the service. As noted in the pilot service, MAS had lots of things to cover at the appointments already and there was little time to mention additional services in detail. This along with high staff turnover means that regular training and

reminding of the services that are available are thought to be needed. Several suggestions were made for alternative referral approaches. These included introducing separate appointments at the MAS, one for diagnosis, and one for next steps/support (either face to face or by telephone); having a PrAISED representative (or someone to represent PrAISED e.g., from the Alzheimer's Society) in clinics for patients to speak to after their appointment; a follow-up telephone call; and broadening referral points to include GPs and other services, for example a social prescribing service, other clinics, e.g., memory clinics, a falls clinic, or day centres, or alternatively, self-referral to the service.

> *"But that's what the Alzheimer's Society could do. It doesn't need to be a psychiatric nurse or an OT, or a physio explaining the service offers, and actually, to have someone in contact with the Alzheimer Society at that point in time, I think it's really good because they are accessible."* (Manager)

> *"It would be interesting if it was a self-referral, so if you went to a memory clinic, a memory cafe for example, and there were lots of leaflets about where people could refer to, and some people can self-refer themselves to NHS services"* (Occupational Therapist)

Intervention design

Staff liked the 12-month duration of the intervention delivered in the RCT and valued this time with patients but thought this was 'nice to do' and not typical of normal practice. They would normally have a much shorter timeframe to work with patients, e.g., 6 weeks, and the patients would be discharged as soon as they had completed the short intervention to make space for the next patient.

> *"You were given a client for six weeks and in that six weeks you set goals and implemented them; and if they didn't complete it, you would signpost them to different ones."* (Occupational Therapist)

Interviewees were unsure where PrAISED would fit in normal clinical pathways and there were mixed views as to whether it should be integrated into existing services or kept as a separate service, with some being concerned 'it would get lost' if it was integrated. The flexibility and tailored approach to visits and activities in PrAISED is important and it was seen to be positive that the intervention was not limited to a fixed number of sessions in a fixed number of weeks followed by discharge from the service because there are

other patients on the waiting list. Getting to know patients, their lifestyle and what they enjoy is helpful, including linking back to things the patients used to do, as these can be linked to the intervention activities.

Intervention materials and training

Having resources to support the delivery of the intervention was very helpful. This included an intervention manual, patient home file and equipment, both for the intervention exercises and to support participants in other ways e.g., rails, plastic step by shower. The intervention manual was thought to be very comprehensive and was a 'bible and reference point' for the intervention. Staff used it in different ways, some 'dipping in and out', but they thought it was important for ensuring the intervention was delivered as prescribed and not just 'ad hoc'. The intervention manual was thought to be invaluable for supporting training.

The patient home folder (an A4 size ring binder folder) was thought to be 'brilliant', and most patients found it useful and took pride in having it. Interviewees reported that the file was however quite big, and some of the paperwork and terminology was confusing for patients. It was suggested that a smaller, simplified exercise booklet might be helpful where staff delivering the intervention can tick off the exercises to do. This might also reduce the burden on delivery staff for carrying lots of paperwork and printing the exercise sheets before the visit, as the current exercise sheets were quite large, and some were thought to be confusing as the photos of the exercises were similar. Interviewees thought the folder was useful for giving patients information to use in the future, even if it was not used during the intervention.

Some staff developed a central resources folder to support signposting to other activities and services during the intervention, though this took time to build up and required local knowledge and experience. Other interviewees used a search engine such as Google to find services. Interviewees thought it would be useful to set up a central folder or database in future for signposting/what services are available in each local area. Sharing knowledge and making use of therapist networks was useful to support this wider knowledge of community resources and how to access these. It was also noted that sometimes there isn't a service that meets the patient's needs in their area.

"There's so many things out there, so many charities, so many resources. I think there's a central resource hub now where you can have a look. So, if you're looking for a dementia swimming group for example, you can just search yourself." (Occupational Therapist)

Whilst most staff already had experience and skills in working with patients with dementia, specific PrAISED training was provided for the research study and the pilot service by the research team. Staff delivering the intervention received different formats and amounts of training depending on when they joined the study. Some received three days face to face, whereas others received two days remotely (mostly due to the COVID-19 pandemic social distancing restrictions); most received refresher training which was also thought to be useful. The training provided was reported to be very good quality and well delivered. Interviewees reported preferring face to face training as it allowed more networking and sharing than remote training. Others liked the online training as it allowed time to pause the session and write notes. Shadowing colleagues was also thought to be useful to increase confidence with delivering the sessions.

"Having a bit of training is definitely important, the training was really helpful for me initially to understand what the aim and what the goals were, what available advice there was out there and how to tailor my visits, and what to do on each visit was really helpful." (Physiotherapist)

Interviewees thought that future training should be offered online and face to face but there was uncertainty as to who could provide this in practice. It was felt that core training was needed but local training may be required to address operational differences in different organisations, and ongoing training should be offered to ensure fidelity of the intervention. It was recognised that staff have differing backgrounds and that training may need to be tailored to take this into account. It was also thought that shadowing an experienced therapist on visits/assessments when new to the intervention to see processes and understand how to deliver the sessions was important.

Discussion

There is a paucity of evidence relating to the implementation of dementia care interventions (Lourida et al., 2017). PrAISED is a 12-month, home-based, individually tailored rehabilitation programme for patients with early dementia or MCI, delivered by therapists and rehabilitation support workers, with a focus on

strength, balance, physical activity and activities of daily living (Booth et al., 2018). The aim of the current study was to identify what is required to implement the PrAISED intervention in routine clinical practice to develop the evidence base for the implementation of dementia care interventions. We explored this through delivering a pilot service and conducting interviews with those delivering PrAISED as a service, as well as those involved in delivering the intervention provided during an RCT.

We found it was feasible to deliver a 6 month PrAISED intervention as a clinical service with some adaptations including removal of the research inclusion criteria and research processes to make it suitable for service delivery. However, referrals were fewer than expected and the shortened duration of the intervention impacted on intervention delivery (increased flexibility with the number of visits, but some changes in session content), which may have affected the fidelity and impact of the intervention. From qualitative interviews, we found themes which align to the CFIR and show implications for the future implementation of PrAISED and other similar dementia care interventions.

Support post-dementia diagnosis

Our study confirms there is a gap in support for patients immediately post-dementia diagnosis. This has been reported previously (Bamford et al., 2021; Gauthier, 2022; Low et al., 2023; Wheatley et al., 2021) and exists despite the policy focus on dementia (National institute for Health and Care Excellence, 2018). Whilst the gap may partially be due to lack of infrastructure, and capacity and capability in services (Wheatley et al., 2021), should these infrastructure and resource issues be resolved, PrAISED or a similar intervention could fill this need for support by intervening early, and providing a holistic and preventive approach for promoting physical and mental health in dementia patients.

Funding, leadership and operational processes

In order to establish and deliver PrAISED or similar dementia care interventions in current UK healthcare systems, funding will be needed with a substantial initial investment to establish resources and staffing for the intervention. There is uncertainty as to how interventions like this could be funded which will be a major barrier to intervention implementation and scale-up. A 'champion' is needed to promote dementia care interventions and provide leadership and management across organisations and the wider healthcare

system. Evidence suggests there is an association between the use of champions and increased use of healthcare innovations by organisations (Santos et al., 2022), and that leadership and management support facilitates implementation of dementia care (Lourida et al., 2017). To facilitate the effective implementation of any new dementia care intervention, and before commencing service delivery, time is needed to establish operational processes, identify how best to embed the intervention into organisational pathways, engage relevant personnel and intervention staff (for referral and delivery), and provide staff training.

Staff skills, intervention training and resources

Staff delivering PrAISED or similar dementia care interventions need to have experience of working with patients with dementia along with wide ranging personal and clinical skills. They need to have capacity to deliver the intervention and be able to work as part of a team. Teamwork is essential for effective intervention delivery, and this is known to be important for providing patient care (Buljac-Samardzic et al., 2020). Intervention specific training is needed for staff referring to any new service as well as those delivering the service; it is not clear who would provide this training, and this requires further exploration. It has been noted that the time and support needed for staff to gain experience and confidence in delivering a new intervention should not be underestimated (Clare et al., 2023). Resources such as training materials, an intervention manual, a patient file and equipment are important for intervention delivery. In addition, therapist knowledge is important for identifying local services and activities to support intervention delivery and sustainability of dementia care.

Patient eligibility and referral

Some of the patients referred to PrAISED were still very well and able; they typically wouldn't be seen in normal services until they had deteriorated and required assistance. Commissioning preventative interventions such as PrAISED for patients with dementia requires a shift in focus for healthcare services to facilitate access to funding and delivering interventions of this type. Whilst the NHS Long Term Plan (NHS England, 2019) highlights the contribution the NHS will make to prevention activities, it may take some time for this healthcare transformation to be realised.

There were challenges in receiving referrals to the PrAISED pilot service, and this has been noted in other similar studies (Clare et al., 2023). Referral pathways need further investigation to increase the number and diversity of patients referred to dementia care services like PrAISED. Ethnic and socio-economic diversity in PrAISED was limited, and research has shown there are substantial barriers to engaging in dementia healthcare, rehabilitation and research for some ethnic groups (Howe et al.; forthcoming). Options for increasing referrals might include considering whether staff in MAS have capacity to undertake referrals to other services alongside their other activities and how this could be managed, and broadening out points of referral, for example to GPs, memory clinics, falls clinics, day centres or self-referral. The timing of referrals to best support patient needs also needs to be considered. Offering flexibility in the timing of when a patient starts a dementia care intervention may help to address patient preferences for when they most need the support.

Intervention design and fidelity

Home-based dementia care interventions such as PrAISED may help to address inequalities in access to healthcare services for some population groups, as well as facilitating the assessment of patients with dementia and supporting them in their everyday environment. The duration of any intervention offered in clinical practice would ideally be long enough to allow time to effectively work with patients and enable them to achieve their goals, and deliver the intervention activities as planned, with flexibility for delivering visits and adapting the intervention to patient needs. Balancing intervention adaptation with intervention fidelity remains a challenge in health promotion and prevention but using adaptable designs, rather than designs with strictly defined fidelity criteria, are thought to be more sustainable and more likely to have public-health impact (Bopp et al., 2013).

Strengths and limitations

This study included a 'first attempt' at delivering the PrAISED intervention as a service in practice. It adds to a paucity of data regarding the implementation of interventions for patients with dementia and provides insight as to what may be required to deliver an evidence-based dementia rehabilitation intervention in routine clinical practice. The pilot service was delivered by an organisation which was involved in the RCT

evaluating PrAISED and therefore they may have already been bought-in to the intervention, have staff and systems in place and be familiar with intervention delivery. Whilst this facilitated intervention implementation in the pilot service, there will be organisational barriers to delivering PrAISED in organisations who are completely new to the intervention. The length of the pilot intervention was constrained by the end date of the PrAISED study, which may have affected fidelity. Many interviewees discussed the difficulties of delivering this shorter intervention to patients, however this may be more reflective of what could be feasibly funded and delivered in NHS services. Given the short duration of the study, the available funding, and the focus on implementation of the intervention, we did not assess the impact of the intervention on patient cognitive and physical outcomes. A future hybrid effectiveness-implementation study is needed to explore this further. Staff who may have been less enthusiastic or motivated to deliver the PrAISED intervention may have been less likely to participate in the interviews.

Conclusion

There is a need for interventions to maintain physical and mental health, and social engagement immediately post-dementia diagnosis. It was possible to deliver a shortened version of PrAISED as a service in practice, but adaptations were required to deliver the intervention as a service instead of research study and referrals were fewer than expected. Future implementation of PrAISED or similar dementia care interventions will require attention to identifying intervention funding, leadership and management, time to establish operational processes, the skills and experience of intervention deliverers, providing training and resources to support intervention delivery, patient eligibility and referral processes, and the duration and components of the intervention. Future research might include a hybrid effectiveness-implementation study to explore these issues further, to examine intervention adaptation and fidelity in practice and to assess the impact on patient outcomes to increase the evidence base for the implementation and effectiveness of dementia care interventions in practice.

Declarations

Ethical Approval

The current study received research governance approvals and ethical approval from the Bradford Leeds Research Ethics Committee as a sub-study to the main PrAISED2 trial (18/YH/0059; 236099) on 25th May 2022. All interviewees gave written or verbal consent to participate. Analysis of anonymised routinely collected data in the pilot service was approved as a service evaluation by the NHS organisation's Research and Evaluation team.

Funding

This study was funded by the NIHR (National Institute for Health and Care Research) Programme Grants for Applied Health and Care Research, award number RP-PG-0614-20007. The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care.

Authors' contributions

EA, RV, ST, EO, SG, JG, TM and RH designed the protocol for the implementation study. HS led the implementation of the pilot service and oversaw recording of data for the service. EA analysed the quantitative data from the pilot service. CB and JL conducted the interviews. EA, CB and JL coded and analysed the interviews and identified recurring themes. EA, CB, JL, RV and RT discussed the findings to facilitate data interpretation. EA drafted the manuscript. All authors critically reviewed and edited the manuscript and read and approved the final version.

Competing interests

The authors declare they have no competing interests.

Acknowledgements

The authors wish to thank the staff and patient participants in the PrAISED implementation study for their contribution to the project.

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