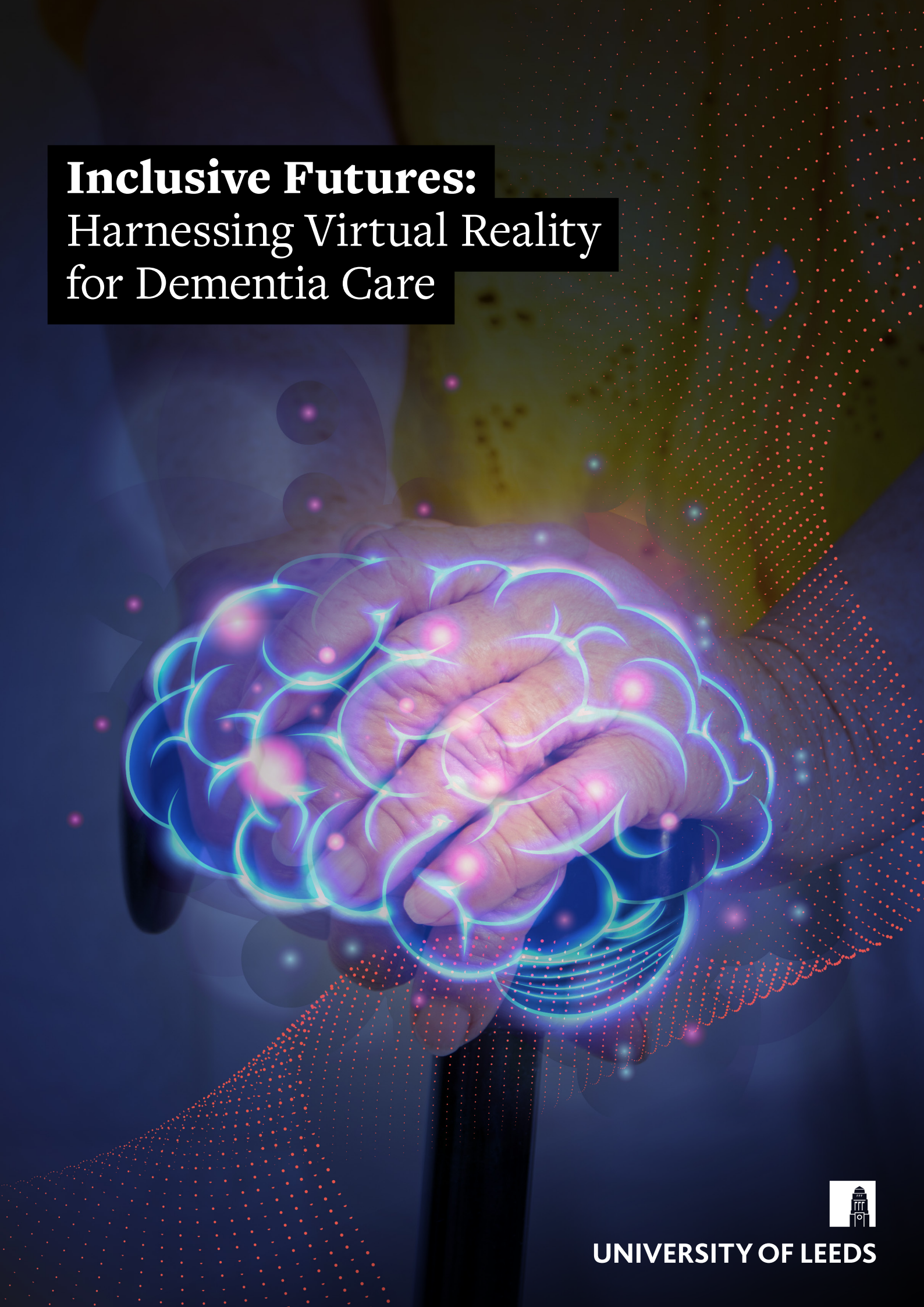
Inclusive Futures: Harnessing Virtual Reality for Dementia Care



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Executive Summary

Dementia care, on both national and global scales, faces mounting pressures as incidence increases, effective treatments remain elusive, and existing support systems struggle to provide personalised, enriching experiences for those in moderate-to-advanced stages of the condition.

Simultaneously, virtual reality (VR) technology has advanced rapidly in both capability and accessibility, offering potentially new ways to deliver immersive experiences to spark reminiscence, social connection, and improve emotional wellbeing. In this report, we explore how these two trajectories—heightened demand for person-centred dementia care and the maturation of immersive technologies—could converge to shape a more inclusive future for people living with dementia. Through four complementary streams of inquiry, we explore the depth and breadth of VR's potential in dementia support. We report on two studies led by the Centre for Immersive Technologies: (i) surveying experts working in healthcare and/or with XR technologies; and (ii) a focus group with the underserved South Asian community. The results of this work show that interventions must reflect personal histories and linguistic preferences if they are to be truly meaningful. We highlight the results of a Yorkshire-based VR company, Recreo VR, who conducted a feasibility trial with 101 participants in community and care-home settings. Their personalised, low-flow 360° videos successfully engaged up to 97% of users, eliciting recollections of treasured life events and facilitating valuable conversations that might otherwise have remained dormant. Finally, a pilot project at Bradford District Care Trust demonstrated that even in the most challenging environment of inpatient wards, VR shows potential for reducing agitation, promoting calmness, and allowing patients who cannot leave the ward to access virtual nature or travel scenes. Collectively, these studies demonstrate the significant potential for VR interventions to be integrated into diverse care pathways, whether as reminiscence sessions in care homes, family-oriented activities in community centres, or therapeutic tools in acute hospital settings. They also underscore that a one-size-fits-all approach will not suffice: content must be culturally relevant, co-designed with people who have dementia, and supported by clear training and guidelines for caregivers. Larger-scale trials, rigorous evaluation of clinical outcomes, and engagement with policy makers will be critical in transforming these promising pilots into standard practice.
By bridging empathy, technological innovation, and cultural awareness, VR may be able to offer deeply personal, uplifting moments for people with dementia, pointing toward a future where immersive care is as inclusive as it is transformative.

Background & Context

Dementia is a syndrome characterised by the progressive deterioration of cognitive functioning 1,2 and arises primarily in older adults. Symptoms such as memory loss, impaired concentration, changes in mood, and difficulties with movement can all interfere with day-to-day life, prompting the need for additional support from carers at home, in community settings, or within residential care facilities 3,4. Because there is no known cure, many interventions target the maintenance of quality of life and cognitive and executive functioning, and it is widely acknowledged that an effective approach demands person-centred care that reflects each individual's history, preferences, and cultural background 5.

Personal photographs and videos have already proven valuable in this area, helping to elicit recollections that, in turn, foster self-esteem and a calmer state of mind in people with dementia 6,7. These reminiscence-based strategies leverage the strong emotional connections that remain tied to personal memories, which continue to play an influential role even as other cognitive processes deteriorate 8. Yet existing interventions often lack an immersive quality that could deepen these benefits. Where real-world opportunities present accessibility issues for many, advances in digital technology now make it possible to deploy immersive platforms that transport people with dementia into reconstructed or simulated environments where personal relevance is further enhanced.

Among these new solutions are extended reality (XR) platforms, including virtual reality (VR), augmented reality (AR), and mixed reality (MR) 3,9,10. When used with a head-mounted display, VR can deliver more vivid, enveloping scenes than static images or conventional videos, and growing evidence suggests that people with dementia often tolerate such interventions well, find them engaging, and may experience elevated levels of pleasure during and after the VR session 11,12. VR-based activities have already been created to address issues ranging from autobiographical memory recall to physical skills practice 13–16.

> VR footage often receive more positive feedback than those using computer generated imagery

Nonetheless, few studies have examined fully personalised VR content designed specifically for dementia, and the existing research is frequently limited by small sample sizes or conducted outside the UK context, pointing to the need for further exploration and more nuanced data.

Within these emerging approaches, personalised scenarios and recognisable real-world elements may be especially beneficial, as early findings show that people with dementia are eager to explore virtual environments that resonate with their own histories, customs, or places of personal importance 17,18. Critically, interventions built around live-action VR footage often receive more positive feedback than those using computer-generated imagery 19,20. While these developments hold promise for dementia care broadly, they also open a pathway for addressing the specific needs of under-served groups or those from culturally diverse backgrounds. For instance, linguistic barriers, religious observances, and differing conceptions of ageing can lead individuals from certain communities to avoid mainstream dementia services 21,22. In some cultures, dementia may be regarded as a normal part of ageing, reducing the perceived necessity of conventional clinical treatments 23.

Because standard interventions rarely reflect these groups' cultural values or first languages, many people receive inadequate or delayed care. Research further suggests that interventions incorporating culturally specific imagery, music, and language not only provide a greater sense of familiarity but can also improve engagement and acceptance, thereby addressing longstanding equity gaps 24,25. Non-invasive, easy-to-deploy VR tools that focus on personal enjoyment and reminiscence—rather than medicalised settings—may be especially well-suited to these contexts, where family-centric caregiving is often preferred and stigma around formal dementia services is more prevalent.

Taken together, these factors underscore the importance of designing VR interventions that are culturally sensitive and personally relevant. Doing so could help alleviate social isolation, improve emotional wellbeing, and encourage early participation in supportive activities. In turn, this raises the question of how best to integrate immersive technology into communities that have historically been overlooked in mainstream care, ensuring that VR content is sufficiently individualised, accessible, and respectful of cultural norms to motivate long-term engagement.

In order to understand how VR might enrich dementia care in these ways, this report draws on four interconnected lines of inquiry: two led by the Centre for Immersive Technologies, which examined expert perspectives and engaged a focus group in a South Asian dementia café to identify culturally informed design priorities; another undertaken by a VR content developer, Recreo VR, who trialled personalised 360° experiences with 101 participants in care homes and community services; and a final strand in an acute hospital environment, where clinicians piloted the use of immersive content to reduce agitation and encourage reminiscence among inpatients with dementia. Each of these lines of inquiry contributes complementary insights into feasibility, user acceptance, and practical implementation, culminating in a set of recommendations that underscore the value of co-design, cultural responsiveness, and ongoing research to maximise the potential of immersive technologies for enhancing quality of life in dementia care.

Experts' Perspectives: Shaping Culturally Relevant Immersive Care

Achieving genuine cultural inclusivity in dementia care hinges on listening to those who live with the condition every day, as well as to professionals who have spent their careers researching cognitive decline and supporting people with dementia. Bringing these complementary voices together is especially important when striving to make VR interventions culturally inclusive. Tailoring content to reflect unique cultural norms, language needs, and personal memories requires direct input from individuals and families who have firsthand knowledge of what resonates and what alienates.

To understand how VR might address longstanding gaps in cultural relevance, particular attention must be paid to communities that historically encounter barriers to mainstream dementia services. Among these groups, South Asian people in the UK experience a comparatively higher prevalence of dementia 22. As the South Asian population ages 24, the demand for interventions that address linguistic, religious, and broader socio-cultural factors intensifies. However, existing dementia care options often fall short of meeting these needs 24. Even when services are technically available, pervasive views of dementia as a normal part of ageing, lack of familiarity with resources, and less trust in formal medical systems can delay or limit uptake among South Asian families 23,26.

Because these factors contribute to low engagement with conventional services, it is essential to develop culturally appropriate, non-invasive approaches that align with family-centric care preferences 21,25. If VR experiences can incorporate contexts or activities that feel familiar, comforting, and respectful of personal identities, they may offer a more acceptable and effective route to engagement. VR-based methods also open possibilities for structuring short, easily accessible sessions that fit smoothly into daily routines—an attribute likely to appeal to those who consider intensive clinical interventions unnecessary or uncomfortable.

To explore how immersive technology might be integrated into dementia care for South Asian communities, a feasibility study was undertaken that emphasised cultural appropriateness at every stage. Researchers gathered insights through two main lines of inquiry. First, a survey was administered to experts in dementia and VR technology to identify guiding principles for creating and implementing extended reality (XR) interventions. This step was motivated by the reality that previous trials of personalisation in VR-based dementia care often involved small cohorts and rarely addressed the complexities of cultural adaptation. By reaching out to professionals across healthcare, academia, and technology, the study sought a broad-based consensus on matters including co-design, user safety, and the ethics of gathering personal data.

Second, a focus group was held with older South Asian adults living with dementia and their carers. The goal was to provide qualitative insights on how people already balancing cultural expectations with cognitive decline might perceive a new intervention. Understanding existing levels of digital literacy and willingness to experiment with an unfamiliar medium was critical—especially in communities where face-to-face, family-led support is the norm, and knowledge about dementia can remain limited or inaccessible. The discussion also investigated whether and how users would want technology-based solutions to incorporate language preferences, religious practices, or shared community routines.

> What emerged from these consultations was the importance of cultural identity

What emerged from these consultations was the importance of cultural identity in shaping meaningful VR content. At a practical level, this may involve developing 360° video experiences showing festivities that mirror participants' cultural traditions, ensuring spoken instructions and narration are available in Punjabi, Urdu, or other relevant languages, and collaborating with community leaders to design experiences that neither impose nor trivialise cultural markers. By weaving lived experiences into the VR environment, the interventions stand a better chance of eliciting positive reminiscences and offering the sense of comfort that high-quality dementia care should provide.

Expert Perspectives: Survey Results

Seventy-two experts in dementia and/or XR technologies completed a survey where they were asked to rate the importance of various factors in designing and implementing VR-based dementia interventions, covering topics such as user-centred development, therapeutic integration, accessibility, cultural sensitivity, evaluation, and policy considerations. Their responses yielded several key themes that consistently surfaced across professions, despite differing levels of expertise in dementia or immersive technology.

Survey Theme 1: **User-Centred Development**

Responses underscored the principle that people with dementia, along with their families and broader care teams, must be actively involved in shaping VR experiences. Many respondents argued that direct feedback from potential users is essential for creating relevant, engaging, and respectful content. One participant stressed that "dementia research should guide the design just as much as XR expertise", suggesting that co-design efforts must blend clinical insight with technological innovation. This view was echoed in open-ended comments advocating for slow-prototyping and pilot testing with real-world users to ensure that each VR element—visual style, pacing, controls—feels intuitive rather than overwhelming.

Survey Theme 2: **Safety, Comfort, and Ethical Practice**

Experts consistently highlighted safety and comfort as pivotal, given that many older adults with cognitive impairments may be wary of digital interfaces or susceptible to cybersickness. They recommended minimising abrupt transitions or high-motion visuals, as well as integrating supportive hardware adaptations. Ethical considerations were also paramount: ensuring informed consent, offering clarity about what data (if any) would be recorded, and safeguarding each participant's dignity. These concerns took on special urgency for those with advanced dementia who could not reliably articulate discomfort or confusion, or have capacity to give informed consent

Dementia research should guide the design just as much as XR expertise

Survey Theme 3: **Accessibility and Usability**

Another strong theme was the need to prioritise accessibility and user-friendliness at every stage of development. Participants pointed out that carers, volunteers, and healthcare professionals might themselves be new to immersive technology. Training resources, "best practice" guidelines, and simple hardware or software interfaces were all seen as crucial for helping staff feel confident about introducing VR into everyday routines. Some dementia specialists insisted on highly personalised content, tailored to each person's life story, while others—particularly those with deeper XR backgrounds—cautioned about practical constraints and scalability challenges. This tension highlights the importance of balancing feasibility with a genuinely person-centred ethos.

Survey Theme 4: **Evaluation, Engagement, and Policy**

Finally, respondents emphasised the value of rigorous, longer-term research to determine how VR interventions affect clinical outcomes such as agitation, mood, and quality of life. Stakeholder involvement—ranging from NHS commissioners to third-sector organisations—was viewed as essential for establishing the evidence base that could justify wider adoption. Concerns about cost, training, and the variable pace of technology uptake in care facilities emerged repeatedly, underscoring the need for structured pilot studies and policy support. While the survey revealed optimism about VR's potential to enhance dementia care, it also showed that widespread adoption will hinge on carefully demonstrating ethical integrity, cultural sensitivity, and measurable impact.

Insights from an Underserved Community: Focus Group

To complement the expert survey findings, which underscored the importance of cultural and linguistic sensitivity, we conducted a focus group session with members of a South Asian dementia café to gain deeper insights into how technology might be perceived and adopted by older adults from underserved communities.

We chose to focus on the South Asian community because they represent a demographic in the UK with both a growing older adult population and a higher-than-average prevalence of dementia 22,27. Individuals from these backgrounds often face similar cognitive and emotional challenges to those in other groups, but their experiences can be further complicated by additional cultural and linguistic barriers. South Asian people with dementia, for example, are less likely to access mainstream health and social services and more likely to rely on close family networks or disengage from formal care providers that fail to acknowledge their dietary, religious, and linguistic needs 28. In some contexts, dementia is also perceived as an expected part of ageing, leading to underdiagnosis and a later uptake of supportive interventions. By offering VR content in relevant languages or reflecting familiar cultural settings we may be able to create interventions that resonate more deeply with people and encourage greater trust and engagement.

Although our immediate focus is on South Asian communities in the UK, it is important to note that the methodological and cultural principles underpinning this work are broadly transferable to other cultural groups who share parallel experiences of exclusion or underrepresentation in dementia services, both nationally and internationally. Many of the same challenges—such as language barriers, and divergent cultural expectations regarding care—affect older adults from diverse backgrounds in countries around the world. Consequently, the lessons learned from developing culturally informed VR approaches for South Asian people may serve as a blueprint for adapting similar interventions in a range of cultural contexts, thereby extending these benefits to a wider global population of people living with dementia.

Focus Group Theme 1: **Technological Knowledge Barriers**

Most attendees reported minimal use of smartphones or computers, relying on magazines and books for leisure, with younger family members or community volunteers stepping in when technology was required. While several participants expressed curiosity about new gadgets, they emphasised that learning was often slow due to combined effects of cognitive decline and unfamiliarity with digital tools. These insights could have broader applicability to other minority and migrant communities facing similar structural barriers and the benefits of culturally tailored VR interventions are likely to be useful to a wide range of older adults who are underserved by standard dementia services.

Within the group, only two carers had firsthand exposure to VR headsets, providing a glimpse into the variability of responses. One individual found VR film-watching engaging, while another quickly removed the headset due to discomfort. Most others were unsure what VR entailed until shown a photograph of a headset, highlighting the importance of thorough explanations and demonstrations when introducing the technology.

Focus Group Theme 2: **Access to Dementia Knowledge**

Across the group, the value of local, face-to-face dementia support services was strongly reiterated. Carers spoke of the difficulty of finding accessible resources about dementia or relevant therapies, with language barriers, digital divides, and limited educational materials restricting the flow of helpful information. Some participants described experiences where vital knowledge could only be gleaned from academic or technical sources, which they found daunting. They saw community gatherings as an essential means of sharing practical insights, bridging the knowledge gap, and alleviating feelings of isolation.

Focus Group Theme 3: **Cultural Considerations**

Focus group participants unanimously underlined the need for culturally and linguistically aligned interventions, pointing out that typical care settings fail to accommodate dietary restrictions, religious observances, or the shared cultural touchstones that form an integral part of daily life. Punjabi and Urdu were singled out as particularly important languages within this setting for this group. Attendees lamented that many respite care services seem designed primarily for English speakers and rarely factor in music, imagery, or activities that might resonate with South Asian traditions. These shortfalls were viewed as a major contributor to low uptake and reduced satisfaction with NHS dementia services.

Focus Group Theme 4: **Intervention Considerations**

When discussing how a potential VR-based intervention might be introduced, participants recommended small-group or one-to-one sessions to maintain focus and ensure that individual queries could be addressed in real time. Larger-scale demonstrations had often proved overwhelming or confusing, especially for individuals with more advanced memory impairments. Participants also emphasised the need for simple, repetitive instructions delivered on a daily or near-daily basis, with the understanding that recall might be patchy or inconsistent. The notion of repeated practice aligns with general advice around cognitive interventions for dementia, where familiarity and consistent routines frequently prove beneficial.

Summary

Overall, the focus group's input echoed many of the themes identified in the survey—particularly around the importance of cultural relevance and the need to respect older adults' comfort levels with technology. Their contributions also underscored why simply providing VR equipment is not enough; effective strategies must incorporate language support, accessible information, and ongoing staff or volunteer training to guide participants through each step of the process.

101 Pathways to Reminiscence: A Feasibility Trial

Building on the focus group's emphasis on familiar, user-friendly content, we turn next to a feasibility trial to see whether personalised 360° videos might engage people with dementia in typical community and care-home settings, and to explore the practical barriers and enablers of VR adoption.

Although the potential of VR for dementia has been recognised by previous studies 3, the existing evidence base remains limited, particularly in the UK, where small-scale projects and research conducted outside of typical care settings means that outcomes are often difficult to generalise. Recreo VR, a Yorkshire-based VR company founded by two developers who experienced firsthand the difficulties of having loved ones in care during the restrictive conditions of COVID-19, identified the need for a more systematic trial of personalised, reminiscence-oriented VR experiences deployed in environments where people with dementia typically receive support, such as care homes and community groups.

Study Design and Setting

Supported by the Alzheimer's Society, a total of 101 people with dementia participated in this feasibility trial, spanning 12 locations including care homes and services managed by the Alzheimer's Society. Of these participants, 50 lived in care homes, while 51 engaged in community-based support programmes. Recreo VR's software library of 360° videos was carefully developed to promote reminiscence, featuring serene natural settings, cultural landmarks local to where participants lived and grew up, and gentle activities likely to resonate with the past lives of older adults. The headsets, designed with lightweight materials and a simple gaze-based interface, aimed to remove physical or cognitive barriers to using VR.

Core Outcomes and Observations

The trial produced encouraging results across several measures of engagement and wellbeing. Of the participants, 97% willingly tried the headsets, spending an average of 8 to 12 minutes in VR per session and typically viewing three different videos. Most found the hardware itself both lightweight and unobtrusive: 97% reported feeling physically comfortable while wearing it, and 90% expressed genuine enjoyment of the VR experience. Further underscoring the potential for repeated use, 86% indicated that they would be interested in using VR again in the future.

One of the chief concerns surrounding VR in dementia care relates to the risk of cybersickness or emotional distress, but no such adverse effects were recorded. A small subset of participants did not find the content appealing; however, these cases were attributable to personal taste rather than discomfort or confusion. Facilitators and relatives noted that, for most participants, the immersive environments triggered discussions around past events and preferences—topics that standard care activities seldom evoked. This phenomenon hints at VR's unique ability to unlock memories and stories and may provide a basis for supporting stronger social interactions. Mechanisms underlying this could be the subject of future research studies.

Dementia-Friendly Design

Central to Recreo VR's approach was a set of strict filming and editing protocols designed to produce calm experiences with a stationary viewpoint and low visual flow, reducing any potential dizziness. Although immersive, the videos avoided abrupt movements, topics related to people's phobias or disorienting transitions. Throughout the sessions, trained staff members encouraged participants to proceed at their own pace and frequently checked for verbal and non-verbal signs of discomfort. This continuous feedback mechanism proved integral to preventing overstimulation or confusion.

By limiting the number of variables that could overwhelm individuals, Recreo VR effectively aligned with emerging best practices in person-centred dementia care. Their headsets' single-application interface removed the need for complex controllers or intricate menu navigation. This design minimised technical hurdles for both carers and service users, meaning the focus remained squarely on the emotional and cognitive value of the virtual environment rather than on navigating a complicated device.

Impact on Mood, Memory, and Social Connection

The observed benefits ranged from improvements in mood and self-confidence to enhanced reminiscence and interpersonal communication. Participants often spoke animatedly about family holidays or significant life moments they were reminded of during VR sessions. Some indicated that the immersive scenery helped them feel "transported," even briefly, back to happier or more active times. Conversations continued well beyond the headset session, suggesting that VR might act as a catalyst for deeper group interaction and personal sharing within care communities.

Although these findings are promising, questions remain about long-term integration. Recreo VR's sessions were predominantly one-off or occasional experiences. Future research might explore whether scheduling regular VR intervals leads to sustained gains in emotional wellbeing or cognitive engagement, or how personalisation could be expanded to reflect increasingly nuanced aspects of an individual's background and preferences. Yet, based on these initial results, VR experiences designed with older adults in mind—especially those underpinned by reminiscence-oriented content—showed strong potential for acceptance, enjoyment, and meaningful interaction in dementia care settings.

Case Studies in Focus

Across all of these scenarios, the common denominator was the power of carefully tailored VR experiences to stimulate curiosity, elicit warm memories, and encourage meaningful connections—both with the content itself and the people around them. By prioritising simplicity, comfort, and thematic familiarity, this trial demonstrates that immersive technology could act as a vital supplement to traditional dementia care approaches, opening doors to moments of joy and reminiscence that might otherwise remain locked away.

Case Study 1:
A Sense of Home on the Farm

One participant had rarely engaged in structured activities, but came to life when experiencing a VR scene set on a working farm. This environment evoked memories of their own farm from decades ago, leading their daughter to remark on how unusual it was to see such enthusiasm. The VR visit not only lifted the participant's mood in the moment but also sparked conversation about livestock, farm tools, and daily routines long forgotten.

Case Study 2:
Rediscovering the Coast

A community-group attendee who once spent summers on the British coast responded warmly to a seaside-themed VR video, exclaiming that it brought back recollections of travelling there with cousins. They spent considerable time afterward recounting stories of sandcastle-building and fish-and-chip suppers. The participant's carer noted that this was the first time they had voluntarily reminisced in weeks.

Case Study 3:
Pain Management and Relaxation

Despite chronic back pain, one participant decided to try a short woodland exploration video at the encouragement of family and facilitators. Surprisingly, they reported feeling less pain while immersed in the tranquil natural scene, and staff observed them maintaining an upbeat demeanour well after removing the headset. This exemplified how VR might temporarily redirect an individual's attention from physical discomfort and also open new possibilities for non-pharmacological interventions.

Case Study 4:
Connecting with Non-English Speakers

A former ballet dancer from Russia, who spoke limited English, was drawn to a VR performance featuring classical music. Although she struggled to understand the English spoken by her carers and other residents, she responded by swaying in her chair and moving her arms gracefully, as if stepping back into a familiar world of dance. Care staff described this as a remarkable moment of recognition, transcending linguistic barriers and fostering a shared sense of pleasure.

Bringing Nature and Reminiscence to Inpatient Wards: A Pilot Study

Complementing the community-based feasibility study, an innovative pilot project led by Bradford District Care Trust (BDCT) was designed to explore the use of VR in acute mental health and dementia care. While VR is rapidly gaining recognition as a possible tool for enriching dementia care in home and community settings, its introduction into inpatient wards—where infection control protocols are stringent, staff time is limited, and many patients experience heightened distress—presents a novel proof of concept. BDCT's early findings not only illustrate the feasibility of VR in these circumstances but also provide a springboard for more extensive trials aimed at validating the longer-term impact of immersive experiences on wellbeing and clinical outcomes.

Tailoring VR for Inpatient Use

In order to give service users a sense of the outdoors—even when they are unable to leave the ward—BDCT adopted VR software originally developed by Orbital Media for Kingston NHS dementia wards. This software offered immersive 360° videos of four distinct locations across the south of England: a tranquil lakeside forest, a hilltop ruin in Shropshire, a Devon beach, and a secluded countryside cabin. Although the general concept of VR in dementia care was not uncharted territory, implementing it in a busy clinical ward demanded several careful adaptations. For example, the VR Pico 4 headset's Velcro straps were replaced with silicone versions to facilitate cleaning and meet infection prevention standards. The headset's back rest was likewise converted to silicone, ensuring that it could be disinfected thoroughly between each use. These measures provide examples of the level of detail required to reconcile VR's potential benefits with the rigours of inpatient healthcare protocols.

On a technical level, BDCT opted for stationary videos that encourage seated viewing, reducing the likelihood of nausea. Each environment has multiple vantage points, accessible via a handheld controller, but staff quickly discovered that a significant proportion of users were content to remain in one location. This minimised the need for complex navigation and mitigated confusion for patients unaccustomed to gaming-style interfaces. A practical challenge emerged in the form of the "VR boundary" that must be set up beforehand. Because this boundary is location-specific, the headset had to be used in precisely the same physical space for each session—a logistical hurdle in a ward where rooms may be reallocated or needed for urgent clinical tasks.

Trial on the Dementia Assessment Unit

Although initially deployed on adult mental health wards, the VR pilot extended to BDCT's Dementia Assessment Unit (DAU) to evaluate whether immersive technology might help calm agitation or enhance reminiscence in people with moderate to severe dementia. Patients were carefully chosen to ensure they could benefit from the intervention without experiencing disorientation or distress. Each session took place in a quiet room, with at least two staff members present to supervise and provide reassurance. Six individuals participated during this phase:

- All six wore the headset without complaint or discomfort, easing concerns that VR headsets might be unsettling for older adults with cognitive impairments.
- The average time in VR was around 15 minutes, but two participants remained happily immersed for over 25 minutes—a remarkably long period for people who often found it difficult to focus on standard activities.
- Users were free to look around and, if they wished, move to different vantage points with the controller. Staff noted that the beach setting was particularly popular, likely due to many participants' memories of childhood or family holidays by the sea.
- Every participant indicated they would be willing to use VR again, suggesting a high level of acceptance despite the novelty of the experience.

Outcomes: **Calmness, Reminiscence, and Social Connection**

The DAU trial pointed to two main benefits. First, patients who had shown signs of agitation or aggression toward staff in that episode became calmer, with no observed confrontations during or immediately after the VR sessions. This hints at the soothing influence of natural or familiar scenes in a closed, clinical environment; a concept that has been theorised but rarely tested in acute settings. Second, a marked increase in reminiscence emerged as individuals commented on how the virtual landscapes reminded them of vacations or personal experiences. Staff members observed that these recollections often sparked further conversation, both with the individual and among group members who had similar memories of beaches, countryside walks, or ruined abbeys.

Moving Forward: **A Proof of Concept for Larger-Scale Trials**

BDCT's venture underscores that with the appropriate modifications and supportive supervision, VR may be safely introduced into inpatient dementia care. This is especially noteworthy given the scepticism some might hold regarding whether technology that relies on wearable headsets can be adapted for busy clinical environments with infection control requirements, and still remain comfortable and user-friendly for older patients in cognitive decline. While it's important to note that the sample size is small and the duration of each session relatively brief, the pilot demonstrates a proof of concept: immersive experiences have the potential to reduce agitation, spur reminiscence, and encourage meaningful dialogue among ward occupants.

These early successes pave the way for bigger questions, such as whether repeated VR sessions might have sustained benefits, whether outcomes differ in distinct subpopulations or dementia stages, and how best to integrate VR with pharmacological and psychosocial interventions. Future large-scale studies could incorporate control groups and implementation frameworks, track clinical outcome indicators (e.g., frequency of agitation or antipsychotic use), and evaluate health economics, providing more robust evidence for policy change and investment.

Conclusion and Next Steps

This report has highlighted the potential for VR to enrich dementia care in multiple contexts—ranging from community settings to acute hospital wards. Taken together, the four distinct lines of inquiry underscore that immersive technologies can offer moments of delight, connection, and reminiscence for people with dementia, even when disease progression has severely restricted their engagement in traditional activities. They also show that meaningful implementation demands far more than simply supplying a headset; diligent attention to cultural sensitivities, linguistic needs, user comfort, and co-design processes proves paramount to any successful intervention.

A Convergence of Insights

The academic expert survey and focus group discussions highlight the importance of designing interventions that address both the universal symptoms of dementia and the unique cultural or personal dimensions that shape individuals' responses. Careful personalisation—whether it involves familiar landmarks, native languages, or cherished family rituals—stands out as a particularly significant factor in promoting a sense of security and enjoyment. RecreoVR's feasibility trial demonstrates how intentionally selected 360° video content can catalyse reminiscence, boost mood, and spark meaningful social exchanges, all without overwhelming care staff or compromising user wellbeing. Meanwhile, the pioneering work at BDCT provides an on-the-ground proof of concept for bringing VR into an inpatient setting traditionally viewed as too regulated and time-pressured to accommodate technology-based interventions.

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Opportunities for Wider Adoption

1. **Person-Centred Content Libraries:** There is a clear need for VR libraries that reflect not only general interests but also culturally specific and locally meaningful scenes. The successes in filming local landmarks, as well as Recreo VR's emphasis on personalised reminiscence materials, suggest that content diversity is vital in addressing the spectrum of memories and backgrounds found within dementia populations.

2. **Enhanced Co-Design Frameworks:** Both the expert survey and focus groups reinforce that people with dementia and their carers must be active collaborators. Co-design protocols, iterative testing, and ongoing feedback loops can ensure that VR interfaces are accessible, that session lengths are appropriate, and that the technology remains user-driven rather than imposed.

3. **Integration into Existing Care Pathways:** The studies collectively make a compelling case for embedding VR sessions into conventional routines, whether through weekly reminiscence activities in care homes, "nature breaks" in inpatient units, or small-group sessions in community hubs. Such integration has the potential to reduce agitation, encourage positive social interactions, and even help with pain management, as reported by some participants.

4. **Focus on Clinical Research and Policy:** Larger-scale, clinical trials are required to establish long-term effectiveness and evaluate cost implications for both care homes and hospital wards. Only then can policymakers and commissioners confidently allocate resources toward VR initiatives, as they seek evidence that immersive interventions can produce measurable gains in quality of life and potentially lessen the need for pharmacological interventions.

5. **Cultural and Ethical Imperatives:** Nearly all stakeholders emphasised respect for cultural identity, linguistic preference, and ethical safeguards. Future efforts should incorporate robust data protection measures, clear consent procedures tailored to cognitive capacity, and content that fully represents the communities involved—whether they are South Asian, other minority groups, or anyone whose life experiences have been neglected by mainstream dementia care.

Recommended Next Steps

1. **Establish Standardised Guidelines**
   Developing openly available “best practice” toolkits would enable care providers, clinicians, and technology companies to align on safe and effective VR usage. These guidelines could address topics ranging from hardware selection, disinfection protocols, and staff training to appropriate session durations, all underpinned by a user-centred ethos.

2. **Commission Larger, Multisite Trials**
   Building on the pilot initiatives described, future research can randomise participants to VR or current interventions, measure changes in agitation or medication usage, and investigate whether culturally adapted content delivers superior results. Expanding the evidence base will be key to attracting policy-level support.

3. **Create Modular, Scalable Content**
   Content libraries should be modular, offering a variety of short segments that can be tailored to different stages of dementia or cultural and linguistic identities. Additional focus on live-action, “low flow” filming can maintain users’ comfort while offering interactive elements where appropriate (such as guided tours in multiple languages).

4. **Promote Community Engagement and Partnerships**
   Working with advocacy groups, local authorities, and cultural organisations can amplify the benefits of VR interventions. Co-producing content with community leaders, filming real-life events or local sites, and holding interactive demonstrations are all ways to foster buy-in from families who might otherwise be hesitant to embrace new technology.

5. **Emphasise Inclusivity and Accessibility**
   As with any innovation in dementia care, VR solutions must remain affordable, intuitive, and flexible. Stakeholders should ensure that the requisite technology—whether headsets, software, or training resources—is financially and logistically feasible for the widest range of care settings, including those serving rural or lower-income populations.

By pursuing these recommendations, it will be possible to both deepen the immediate benefits of VR for people with dementia and build a robust foundation for the future of immersive healthcare. Efforts to address cultural, technological, and infrastructural barriers will ensure that VR does not become an isolated novelty but rather an integral, evidence-based aspect of high-quality dementia support.

Expanding the evidence base will be key to attracting policy-level support

References

1. NHS. What is dementia. nhs.uk **https://www.nhs.uk/conditions/dementia/about-dementia/what-is-dementia/** (2023).

2. World Health Organisation. Dementia. **https://www.who.int/news-room/fact-sheets/detail/dementia** (2023).

3. Appel, L. et al. Virtual reality to promote wellbeing in persons with dementia: A scoping review. J. Rehabil. Assist. Technol. Eng. 8, 20556683211053950 (2021).

4. Prince, M. J. et al. The burden of disease in older people and implications for health policy and practice. Lancet Lond. Engl. 385, 549–562 (2015).

5. Nehen, H.-G. & Hermann, D. M. Supporting dementia patients and their caregivers in daily life challenges: review of physical, cognitive and psychosocial intervention studies. Eur. J. Neurol. 22, 246-e20 (2015).

6. Hung, L. et al. Feasibility and acceptability of an iPad intervention to support dementia care in the hospital setting. Contemp. Nurse 54, 350–361 (2018).

7. Yasuda, K., Kuwabara, K., Kuwahara, N., Abe, S. & Tetsutani, N. Effectiveness of personalised reminiscence photo videos for individuals with dementia. Neuropsychol. Rehabil. 19, 603–619 (2009).

8. De Vita, D., Sagliano, L. & Trojano, L. Memory biases in Alzheimer's disease and mild cognitive impairment. A systematic review and metanalysis. Neurosci. Biobehav. Rev. 152, 105277 (2023).

9. Ridout, B., Kelson, J., Campbell, A. & Steinbeck, K. Effectiveness of Virtual Reality Interventions for Adolescent Patients in Hospital Settings: Systematic Review. J. Med. Internet Res. 23, e24967 (2021).

10. Suh, A. & Prophet, J. The state of immersive technology research: A literature analysis. Comput. Hum. Behav. 86, 77–90 (2018).

11. Rose, V. et al. Bringing the outside in: The feasibility of virtual reality with people with dementia in an inpatient psychiatric care setting. Dementia 20, 106–129 (2021).

12. Strong, J. Immersive Virtual Reality and Persons with Dementia: A Literature Review. J. Gerontol. Soc. Work 63, 209–226 (2020).

13. Benoit, M. et al. Is it possible to use highly realistic virtual reality in the elderly? A feasibility study with image-based rendering. Neuropsychiatr. Dis. Treat. 11, 557–563 (2015).

14. Chapoulie, E. et al. Reminiscence Therapy using Image-Based Rendering in VR. in 2014 IEEE Virtual Reality (VR) 45–50 (2014). doi:10.1109/VR.2014.6802049.

15. Faw, M. H., Buley, T. & Malinin, L. H. Being There: Exploring Virtual Symphonic Experience as a Salutogenic Design Intervention for Older Adults. Front. Psychol. 12, 541656 (2021).

16. Muñoz, J. et al. Immersive Virtual Reality Exergames for Persons Living With Dementia: User-Centered Design Study as a Multistakeholder Team During the COVID-19 Pandemic. JMIR Serious Games 10, e29987 (2022).

17. Coelho, T. et al. Promoting Reminiscences with Virtual Reality Headsets: A Pilot Study with People with Dementia. Int. J. Environ. Res. Public. Health 17, 9301 (2020).

18. Tominari, M., Uozumi, R., Becker, C. & Kinoshita, A. Reminiscence therapy using virtual reality technology affects cognitive function and subjective well-being in older adults with dementia. Cogent Psychol. 8, 1968991 (2021).

19. Huang, L.-C. & Yang, Y.-H. The Long-term Effects of Immersive Virtual Reality Reminiscence in People With Dementia: Longitudinal Observational Study. JMIR Serious Games 10, e36720 (2022).

20. Niki, K. et al. Immersive Virtual Reality Reminiscence Reduces Anxiety in the Oldest-Old Without Causing Serious Side Effects: A Single-Center, Pilot, and Randomized Crossover Study. Front. Hum. Neurosci. 14, 598161 (2020).

21. Uppal, G. & Bonas, S. Constructions of dementia in the South Asian community: a systematic literature review. Ment. Health Relig. Cult. 17, 143–160 (2014).

22. Hossain, M. Z., Tarafdar, S. A., Kingstone, T., Campbell, P. & Chew-Graham, C. A. From detection to preparing for the end-of-life: A qualitative exploration of the South Asian family carers' experiences of the journey with dementia. Health Soc. Care Community 30, e5135–e5144 (2022).

23. Turner, S., Christie, A. & Haworth, E. South Asian and white older people and dementia: a qualitative study of knowledge and attitudes. Divers. Equal. Health Care 2, (2005).

24. Giebel, C. M. et al. South Asian older adults with memory impairment: improving assessment and access to dementia care. Int. J. Geriatr. Psychiatry 30, 345–356 (2015).

25. Jenkins, C. & Kamal, A. A qualitative study exploring nurses' experiences of supporting South Asian people with dementia and their family carers. J. Adv. Nurs. 80, 161–175 (2024).

26. Lawrence, V., Murray, J., Samsi, K. & Banerjee, S. Attitudes and support needs of Black Caribbean, south Asian and White British carers of people with dementia in the UK. Br. J. Psychiatry 193, 240–246 (2008).

27. Blakemore, A. et al. Dementia in UK South Asians: a scoping review of the literature. BMJ Open 8, e020290 (2018).

28. Regan, J. L. Redefining dementia care barriers for ethnic minorities: the religion–culture distinction. Ment. Health Relig. Cult. 17, 345–353 (2014).

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