

Using PARO, a robotic seal, to support people living with dementia in inpatient care settings

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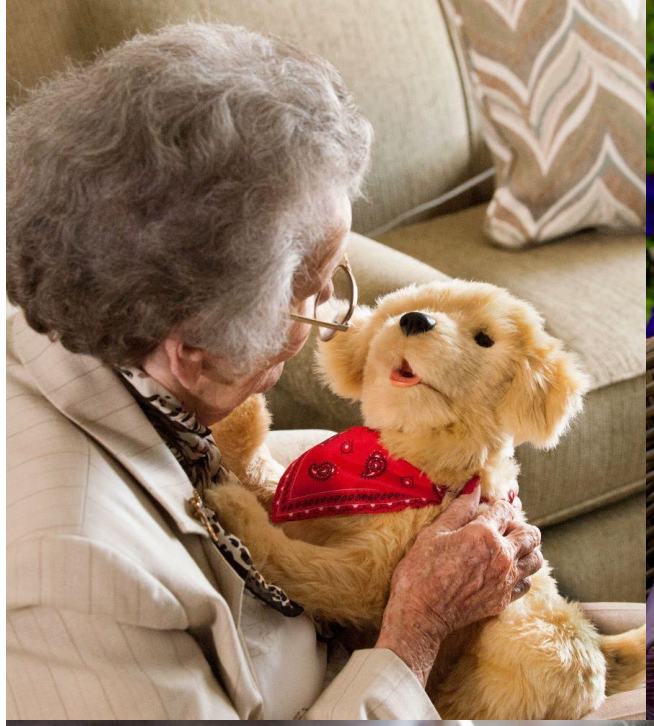
Background

- Research indicates robotic animals can offer numerous benefits to people with dementia.
- Robotic animals can engage individuals with their lifelike movements and sounds, stimulating memory and providing a sense of comfort.
- Robotic animals as a substitute to live animals may circumvent potential safety risks associated with interactions with live animals.



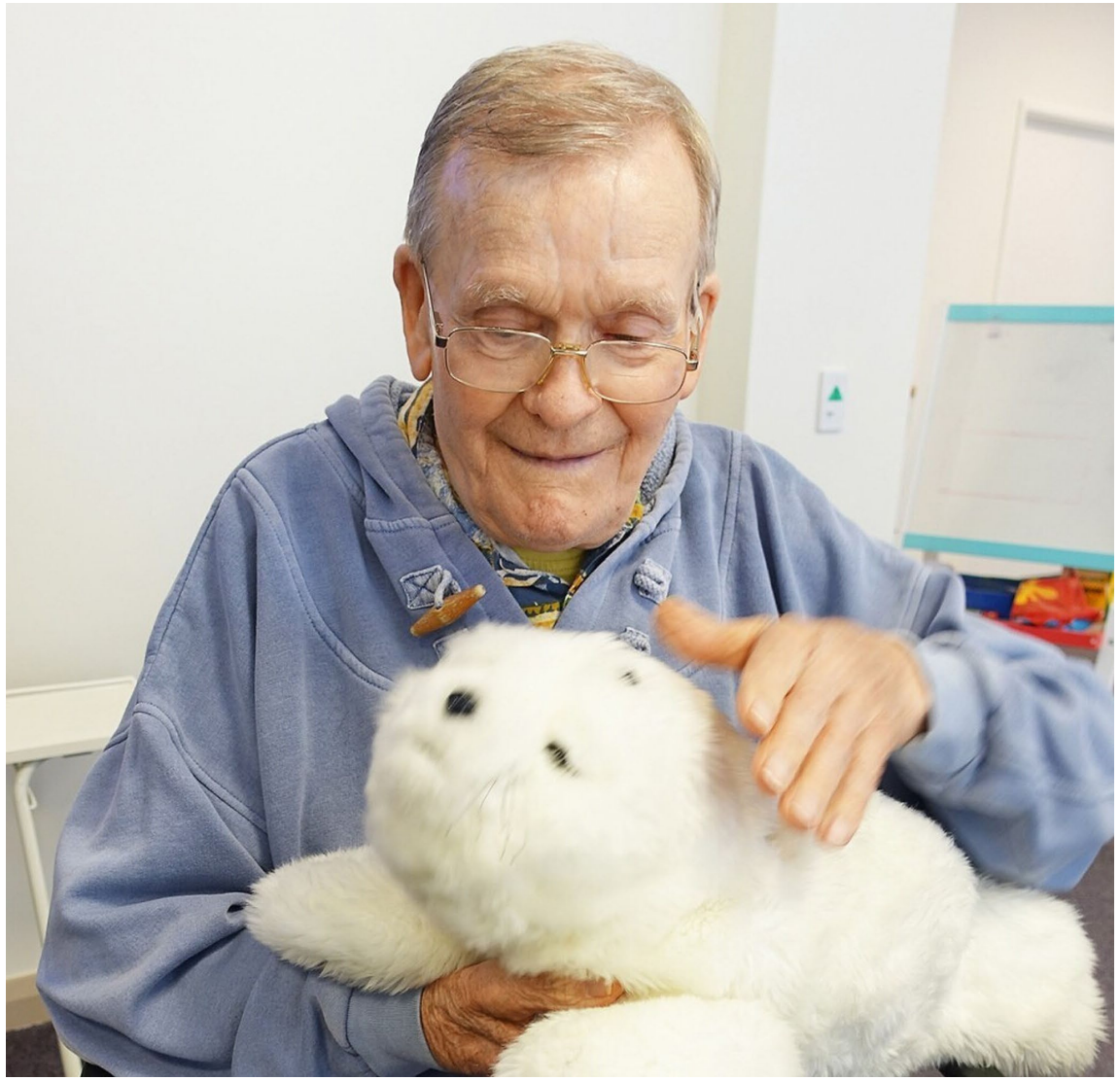
Robotic animals within dementia care

PARO the robotic harp seal

- PARO, modelled on the features of a baby harp seal, has shown potential to support people living with dementia.
- PARO is commonly used as a substitution for interventions with live animals.
- However, despite increased use, evidence is mixed, and concerns have been raised (e.g., infantilisation).

Using PARO in research in practice

- Most research on PARO in dementia care reports findings in care home settings.
- Research that has been conducted is limited by methodological rigour.
- Little research has been conducted to improve our understanding of how and why these interventions may ‘work’ within inpatient dementia care.



Our study aims

- To address current limitations in the field, our study used principles from realist methodology to explore aspects of an intervention using PARO that work, for whom, under what circumstances, and how.
- The overarching aim of the study was to contribute insights into for whom PARO works best in the inpatient dementia care context, and what the change mechanisms involved in this context might be.

Research questions

What are the core components of the robotic animal intervention provided in an inpatient dementia care context?

What are the likely psychosocial outcomes of the robotic animal intervention within inpatient dementia care?

By what contextual factors do robotic animal intervention outcomes appear to be influenced within inpatient dementia care?

What are the proposed mechanisms underlying any potential impact of the robotic animal intervention within inpatient dementia care?

Intervention context

- PARO is equipped with tactile sensors, including sound, light, temperature, and touch.
- PARO responds to physical and social interaction and can exhibit lifelike emotional responses.
- The robotic animal intervention was delivered by Clinical Psychology staff on a participating NHS inpatient dementia ward in the UK.
- PARO is used as a purposeful, person-centred clinical intervention.

Methods

- **Semi-structured interviews** were conducted with healthcare professionals, people with dementia and their relatives to explore the delivery and receipt of the intervention.
- **Observations** of sessions were conducted to gain further insight into provision and implementation of sessions using PARO in ‘real time’.
- Data from interviews and observations aimed to collect information on the:
  - **Intervention**: nature and characteristics of the robotic animal intervention
  - **Context:** social and physical environment in which the intervention was implemented
  - **Actors:** participants involved in the receipt and delivery of the intervention
  - **Mechanisms:** the potential mechanisms of change
  - **Outcomes:** unintended and intended psychosocial outcomes of the intervention
- **Data analysis:** Data were analysed using thematic analysis and we constructed a visualisation of our findings within the ICAMO model.

Demographics: Interviews (n = 13)

Healthcare professionals (n = 6)	4 female 6 White British Varied roles (e.g., Psychologists, Activity Coordinators, Occupational Therapists)
People with dementia (n = 4)	2 Female 4 White British 3 Mixed dementia; 1 Vascular dementia 4 Moderate to severe dementia
Relatives (n = 3)	2 Female 3 White British 2 children; 1 spouse

Demographics: Observations (n = 6)

4 female, 2 male	6 White British
4 Mixed dementia; 1 Vascular dementia; 1 Alzheimer's	6 moderate to severe dementia

Results

ICAMO element	Themes	Sub-themes
Intervention	Robotic animal intervention content and delivery process	• Session structure • Promoting autonomy • Intervention duration and frequency • One-to-one delivery
Context	Provision of a safe space to facilitate focused engagement	• The importance of a private space within a busy and medicalised care setting • Providing a safe and caring atmosphere • Infection control
Actors	Delivery and facilitation: skills and training	• Training, experience, and core values
	Receipt: appropriate identification of individuals with dementia	• Influence of individual needs on engagement • History of pet ownership or ‘animal lovers’
Mechanisms	Potential mechanisms underlying the impact of interacting with PARO	• Enhancing social interaction • Working with attachment • Evoking emotive memories • Physical interaction and sensory stimulation • Perception of PARO as a live being
Outcomes	Impact of attending sessions	• Positive impact on mood and verbalisation in the moment • Soothing effect of PARO • Potential negative impacts of session attendance

Robotic animal intervention content and process

Session structure

"The seal is subtly introduced. He starts with him on his lap and explains the seal. It's initially gauging interest. It would be too overwhelming to put the seal on someone's lap – it's better to gradually introduce the seal."

Promoting autonomy

"A fairly circumscribed intervention that's personalised so we are bearing in mind the person's needs, identity and history. There are not any pre-determined activities, but more of a recommendation for the interaction and then respond with the seal in response to the needs of the person."

Intervention duration and frequency

"The guidance is 20-30 minutes. We need to carefully wind down and not just abruptly take the seal away. Not prescriptive, but guidance, in the amount of time people can engage and process information and not be overstimulated."

One-to-one delivery

"It may become quite overwhelming and intense in a group. Individually, it's really sweet that people can get close to the seal, singing to it, they're engaging and whispering to it."

Provision of a safe space to facilitate focused engagement

Providing a safe and caring atmosphere

"There is a lot to think about in terms of how they're experiencing and engaging with the seal, and how we facilitate that. How we make people feel safe but in a very positive, open way. It's about being fun and providing a nice experience."

The importance of a private space within a busy and medicalised care setting

"We do not use the seal in a communal space because it gets difficult to control and see it as a purposeful intervention. For some, they have not been able to leave their room or have chosen not to, so we've taken the seal to them."

Infection control

"We clean him with disinfectant spray and wipes. They were encouraged not to share during Covid, so he had to be thoroughly wiped down and cleaned. He still is now."

Delivery and facilitation: skills and training

Training, experience, and core values

"You need to have experience in working with therapeutic activities and how they're meant to be delivered, and how to introduce the seal appropriately. To have the experience if someone is getting tearful, reassuring them, trying to re-focus their attention, but if they are not engaging, draw the session to a close. Focus on their emotions. Empathy is one of the most important things."

Receipt: appropriate identification of individuals with dementia

Influence of individual needs on engagement

"Be as person-centred as possible and the content of the session should be guided by the needs and preferences of the person – whichever level they are at."

History of pet ownership or 'animal lovers'

"We are mindful of those who are scared of animals. We are not specifically identifying those who have animals or like animals, but we are more confident they will respond to the seal better."

Potential mechanisms underlying the impact of interacting with PARO

Enhancing social interactions

"They have the same conversations every day of their lives, but the seal can be used as an interesting conversation starter to initiate different topics that we wouldn't usually talk about."

Evoking emotive memories

"It's triggered a bit of an emotional life story conversation about previously owned pets, which has been really positive."

Working with attachment

"Animals can be our partners, our family, our friends, and when people come here, it's a very big change. People are missing their family, the seal can allow them to project that onto him, that connection, because he is very lifelike. The seal provides a safe space for that connection."

Perception of PARO as a live animal

"They say it's cuddly, furry, soft, the eyes are big – all characteristics of what makes an animal cute, how lifelike it is. One had the seal on her lap and she was patting him on the back, 'I can feel you wriggling', so it's that movement and that closeness."

Physical interaction

"The mechanism for some can be the comfort and the pleasure that is derived from holding and stroking the seal."

Impact of attending sessions

Positive impact on mood and verbalisation in the moment

"The person had defined it in that moment as something to talk about, which is so positive, because at that point, he was non-verbal. The seal was a really beneficial tool to get him to open up and increase his mood."

"Even if it sparks five minutes of joy for her, then it is absolutely worth it."

Soothing effects of PARO

"A lot of people absolutely love animals, but it can be hard to bring live animals onto the ward. I think offering the robotic animal is a fun, alternative way to offer animal activities, and can be really soothing to people who miss their own."

Potential negative impacts

"It wouldn't be like you're making a fool of him, would it? He's a grown man – would it be silly? I know he has dementia, but he's still my husband, and I think of him as he was. I don't want him to be ruled as daft."

Framing results within the ICAMO model

Context

- Caring and safe social atmosphere
- Private, undisturbed space

Actor *(facilitator)*

- Competent, skilled facilitator with person-centred communication
- Understanding of delivering therapeutic sessions
- Core values (patience, empathy, respect)
- Informal training for implementation

PARO intervention

- Structured introduction and ending
- Goal-directed session, promoting participant-led and autonomous activity
- Consider individual needs and preferences
- Brief one-to-one sessions (20-30 mins) delivered on a flexible basis

Indirect actor *(relative)*

- Attitudes and beliefs towards PARO
- Willingness to attend a shared session

Actor *(person with dementia)*

- Interest in PARO, regardless of severity/type of dementia
- Identification of individuals guided by history and possible affinity to animals
- Exclude those who have exhibited fearful reactions towards animals

Mechanisms of change

- Enhancing verbalisation and social interaction (with facilitator & PARO)
- Working with attachment
- Evoking emotive memories
- Sensory impact through physical interaction
- Perception of PARO as a live being

Intended outcomes

- Positive impact on mood, verbalisation, and engagement with the facilitator and PARO
- Catalysing the expression and processing of emotions
- Positive impact on social interaction
- Soothing effect through physical touch
- Positive engagement in meaningful activity

Unintended outcomes

- Identifying new therapeutic techniques for participant

Conclusion

- To the best of our knowledge, this is the first study to contribute such insights within inpatient dementia care, by explicitly considering the context and mechanisms of a robotic animal intervention within this setting.
- It is important for future research to test the findings obtained from this study, with the ICAMO configuration guiding the research design and intervention implementation.



Thank you for listening!

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