

Home Use of a Conversational Robot in Older Adults Living Alone
With Cognitive Impairment in Japan: Results From 16-Week and 18-
Month Deployments

P3-10

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KEY TAKEAWAY: Home conversational robots were feasible and acceptable for older adults living alone with cognitive impairment; future LLM-supported systems should improve conversational depth, flexibility, and user control.

Introduction

Older people living alone with cognitive impairment are at increased risk of loneliness and related mental-health problems. Conversational companion robots may offer scalable home-based support, but evidence for their acceptability and sustained use in cognitively impaired populations remains limited. We therefore examined short- and long-term home deployments of conversational robots, with a preliminary extension to a large language model (LLM) -supported robot.

RoBoHoN

- 20cm, 400g
- Scenario-based conversation
- Sing & Dance



Sota(AI-supported ver)

- 28cm, 800g
- LLM-based conversation (Conversational function only)



Study design	Duration	Participants	Main focus
RoBoHoN, single-arm mixed-methods study	16 weeks	MCI, mild dementia, late-onset psychosis, n=11 enrolled; n=9 completers	SUS (usability), UCLA-LS3 (loneliness), GDS-15 (depression), interviews
RoBoHoN, case series	18 months	MCI or late-onset psychosis, n=5	Repeated measures above
LLM-supported Sota, qualitative study	1 week	MCI, n=8 (not limited to person living alone)	Interviews, log-based use record

Key Quantitative Results

In the 16-week RoBoHoN study, usability was high and effect sizes suggested small-to-moderate reductions in loneliness and depressive symptoms, although changes were not statistically significant.

 **Completion rate** **81.8%**

 **SUS** **81.7**
High usability

 **UCLA-LS3** **r = 0.40**
Reduced loneliness

 **GDS-15** **r = 0.64**
Reduced depressive symptoms

In the 18-month RoBoHoN study, all five participants used RoBoHoN in daily life with intermittent light-touch support. Four of five wished to continue robot use after study completion.

Key Qualitative Results

 **Perceived benefits**

- Companionship and a sense of presence
- Enjoyment of conversation
- More opportunities to speak
- Routine greetings and encouragement

 **Conversational limitations**

- Limited conversational depth
- Delayed or mismatched responses
- Repetitive or superficial exchanges
- Difficulty maintaining topic continuity

 **Implementation and safety issues**

- Technical/usability issues requiring occasional support
- Privacy concerns around voice/camera use

LLM-supported Sota: preliminary extension

During 1-week home deployment, Sota was used on **72.4%** of full deployment days (mean dialogue-mode time, **68.2 min/day**). Participants perceived Sota as intelligent and capable of more natural, open-ended dialogue. However, acceptability still depended on low latency, smooth turn-taking, sufficient conversational depth, and user control over interaction.

Conclusions

Across 16-week and 18-month deployments, RoBoHoN was feasible and acceptable for home use, offering companionship despite conversational limitations. Early Sota findings support future comparison with LLM-supported robots.

Ongoing Next Steps

- Refine LLM dialogue, user control, and safety
- Test sustained home use and psychosocial outcomes
- Compare scenario-based and LLM-supported robots

Contact

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Related references and Disclosures

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