Robot voice calls asking older adults daily life difficulties for the prevention of early dementia

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Purpose As the number of dementia patients is increasing, early measures to prevent or slow its progress are needed. Dementia is a disease diagnosed when a decline in cognitive function interferes with daily life; thus, asking older adults about their daily life difficulties is one early method of assessment. For example, forgetting a schedule or forgetting what one has already bought and buying it again when shopping could indicate dementia. The daily difficulties this study aims to deal with are not ones a person is unworried about, but rather ones causing them concern. We used a dialogue robot to ask older adults about their difficulties to clarify if this approach can reliably identify these concerns. **Method** There are two ways for a robot to ask older adults about their daily difficulties: directly and indirectly. First, we examined the responses of participants when they were directly questioned by a robot. Since it can be difficult to find out a person's actual situation, even from a human conversation partner, we added the following ideas for the contents of the robot's comments: show that the robot perceives the problem positively, or that robot itself or the person's friends also have the problem. In a pilot experiment, we used the BONO-06, shown in Fig. 1, to ask users questions in a scenario-based dialogue (Kumagai et al. 2022) that lasted about 5 to 10 minutes. Based on a preliminary questionnaire about daily difficulties, the robot asked questions about what the person was and was not having trouble with, and the contents and timing of the participants' responses were recorded. The contents of the robot's questions are shown in Table 1. The questions were selected based on User A's questionnaire because User B had difficulties with nothing asked about in the questions. The same questions were asked of both users. **Results and Discussion** A man and a woman in their late 60s participated the experiment. Table 2 shows the users' answers to the questionnaire and replies to the robot. There were two out of six items in which their responses to a questionnaire and their responses to the robot were different. One participant would not say, "I am in trouble" unless they were seriously in trouble, when completing the questionnaire on their own, but when the robot asked them, they said, "If I had to say it, I am in trouble." One of the reasons for this discrepancy is thought to be that the participants were trying to establish a dialogue with the robot. Even when the response to the robot were a simple yes or no, participants often added more information about their difficulties after the robot had replied to them. As a next step, we will conduct experiments with a larger number of participants and analyze their responses to consider better methods for eliciting information on the daily difficulties of older adults. We also need to analyze differences in responses due to differences in cognitive function.

Figure 1 Robot for experiment

Table 1. Content of questionnaire and the robot's questions

Q1	Are you afraid of falling when walking down stairs?
Q2	Do you find it difficult to park a car?
Q3	Do you find that you cannot concentrate on restaurant menus?
Q4	Do you find that you rarely taste anything?
Q5	Do you have trouble cleaning your home?
Q6	Do you sometimes forget that you are cooking or doing laundry?

Table 2. Users' answers to the questionnaire and replies to the robot (✓: No problem, ×: Problem, —: irrelevant)

		Q1	Q2	Q3	Q4	Q5	Q6
User A's answers	to questionnaire	×	×	✓	✓	×	✓
	to robot	×	×	×	✓	×	×
User B's answers	to questionnaire	✓	—	✓	✓	✓	✓
	to robot	×	—	×	✓	✓	✓

References

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Keywords: dementia, older adults, dialogue robot, daily difficulties

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Acknowledgement This research was supported by the JSPS KAKENHI (Grant Numbers: JP22H04872, and JP22H00544) and the Japan Science and Technology Agency (Grant Numbers: JPMJCR20G1, JPMJST2168, JPMJPF2101, and JPMJMS2237).