

Examining the Role of Conversational AI in Personal Informatics Systems for Collaborative Health Work and Care

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Conversational AI has the potential to facilitate not only individual but also collective and collaborative personal informatics practices by reducing the data capture burden, allowing for richer data collection, and offering empathic interactions. However, we have a limited understanding of how different stakeholders perceive the role of conversational AI in their collaborative health work and care. To examine the impact of integrating conversational AI into personal informatics systems for collaborative health work and care, we are planning to conduct an interview study with older adults living alone and social workers who are using a conversational AI system, CLOVA CareCall for monitoring the older adults' health and providing social companionship.

CCS Concepts: • **Human-centered computing** → **Human computer interaction (HCI)**; **Empirical studies in HCI**; **Natural language interfaces**; **Collaborative and social computing**.

Additional Key Words and Phrases: Conversational AI, Older adults, Speech-based interaction, Personal Informatics

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1 INTRODUCTION

While research on Personal Informatics (PI) has predominantly focused on individuals' tracking practices for improving self-understanding, researchers are increasingly examining collaboration among families, clinicians, and public health officials around personal data generated from self-tracking [3]. One promising technique to support collective and collaborative PI practices is speech-based interaction. Recent studies on integrating speech-based interaction with conversational AI into PI systems have suggested the technique can lower data capture burden [10, 11], increase the richness of data collected [10], and facilitate the data exploration [6]. Speech-based interaction also has the potential to assist self-tracking practices for public health by offloading the burden of collecting community-level health data while preserving the quality of tracking data. However, previous research prototypes leveraging speech interaction were predominantly aimed at promoting the self-understanding of individuals. Thus, there is a lack of understanding of how speech-based interactions might impact collective and collaborative PI practices for public health.

We set out to examine the role of conversational AI in PI systems designed to help mitigate social isolation in older adults. Social isolation in older adults is a significant public health crisis associated with a range of health problems such as increased risk of dementia, depression, heart disease, and stroke [2]. However, with the rapid growth in the aging population, many countries including the United States are experiencing a severe caregiving shortage in supporting older adults in social isolation [13]. Accordingly, numerous technologies, including robotic pets and telecare devices, have been proposed to alleviate loneliness in older adults and monitor their health [1, 18, 19]. With

new advances in artificial intelligence (AI) and natural language processing (NLP) technologies, conversational AI opens up a new promising avenue for care for older adults, potentially enabling more empathic interactions when collecting personal data or providing contingent recommendations for action [9, 15]. However, little is known about how different stakeholders—older adults who directly interact with an AI and social workers who monitor the data collected through the AI system—perceive the role of care technologies driven by conversational AI.

We are designing a study to understand how an AI-powered conversational system, **CLOVA CareCall** (*cf.*, [8]; referred to as CareCall hereinafter for brevity), impacts the data-driven collaboration between older adults and social workers in the context of social isolation interventions. CareCall regularly checks up on older adults living alone via automatic phone calls, with the goal of assisting social workers’ efforts in taking care of older adults in social isolation as public health measures. CareCall simulates conversations between social workers and older adults not only to collect data about older adults’ general health, but also to serve as a conversational partner to mitigate social isolation. Unlike previous conversational systems that predominantly depended upon rule-based dialog flows, CareCall leverages a large-scale pre-trained language model, HyperCLOVA [5], thereby generating human-like questions and answers on the fly. The following is an excerpt from a conversation between the CareCall agent and an older adult:

CareCall	<i>Did you sleep well last night?</i>
Older adult	<i>Nope, I’m not sleeping well these days.</i>
CareCall	<i>What’s wrong? Are you worried or anxious about something?</i>
Older adult	<i>I don’t worry about anything, but I have a problem with my knee...</i>
CareCall	<i>Do you feel pain in your joint?</i>
Older adult	<i>Not sure what’s exactly wrong, but my knee feels sore...</i>
CareCall	<i>Oh, I am sorry to hear that. Why don’t you try massaging using hot water or using pain relieving patches then?</i>

The introduction of CareCall poses questions about the role of AI-driven conversational PI systems for older adult care. While the introduction of such a novel AI-driven system may free social workers up to provide other kinds of more useful support, it might challenge their ability to build rapport with older adults. There are also questions about whether such a system can support collecting relevant data from the older adults, as well as providing the empathic support necessary for quality care. Therefore, CareCall presents a useful case study to understand how the stakeholders perceive the impact of AI-driven PI systems on collaborative health work and care. To that end, we set out to investigate the following research questions:

- RQ1: How do *social workers* perceive the impact of conversational AI-driven PI systems on their work practices checking up on older adults living alone?
- RQ2: How do *older adults* perceive the impact of conversational AI-driven PI systems on the care that they have received from social workers?

2 RELATED WORK

Our study draws upon previous research on speech-based data collection and conversational agents for older adults. Recent studies have shown the potential benefits of integrating speech-based interaction into PI systems. Speech-based interaction can lower the data capture burden because it allows hand-free interaction [11] and faster data input [10, 17]. In addition, speech interaction can contribute to richer data collection by holding people accountable for providing necessary details by simulating interpersonal conversations [10]. Speech interaction incorporated in personal tracking technology has been relatively simple, primarily considering speech as an input modality [6, 10, 11]. However, new advances in AI and NLP technologies have enabled more complex speech interactions [14], which could enable empathic

interactions when collecting personal data or provide contingent recommendations for action by analyzing large-scale data [15]. Furthermore, although more research on PI is increasingly examining collaborative tracking practices for health, previous research prototypes leveraging speech interaction were predominantly aimed at promoting the self-understanding of individuals. As a result, there is opportunity to extend our understanding of how speech-based interactions may impact collective and collaborative PI practices for public health understanding.

HCI researchers have increasingly investigated how conversational agents might support older adults in various aspects such as health information-seeking [16], memory support [16, 21], and social companionship [15]. Prior work also suggested that older adults found conversational agents more approachable than visual display-based technologies [15, 16]. While previous studies offered useful insights on how older adults might use and perceive features of conversational agents, less work has examined their role as data collection tools. Moreover, introducing new care technologies, including conversational agents, to support older adults also requires consideration of different stakeholders including informal caregivers (e.g., family members) or formal caregivers (e.g., healthcare professionals). Previous studies have pointed out that the introduction of care technologies could lead to unexpected and unwelcome work for older adults as well as for their caregivers [7, 19, 20], which suggests the need for understanding how such technology might fit into older adults' everyday life and their caregivers' workflow.

3 STUDY PLAN

We are planning on an interview study to understand how a conversational AI system might impact the collaboration between social workers and older adults in the context of social isolation interventions. The beta version of CareCall has been deployed to older adults living alone in Busan, the second largest city in South Korea, since November 2021. We plan to recruit older adults and social workers who are currently using CareCall through recommendations of four of the authors who are current employees at NAVER, an enterprise that developed the CareCall system. In the individual interviews with older adults, we plan to ask questions focusing on the impact of CareCall on the care that they receive from social workers. For example, how do they feel about the empathic support that the system aims to provide, compared to what social workers have provided? In the individual interviews with social workers, we plan to ask questions focusing on the impact of CareCall on their work practices checking up on older adults. For example, with the introduction of CareCall, do they perceive that they came to focus better on providing more needed support or lost opportunities to build rapport with older adults?

4 WORKSHOP PARTICIPATION

Our research team has a long history of PI research. We specifically have investigated how personal tracking technology can better support clinical and public health decisions [4, 9], facilitate speech-based data collection [12], and data exploration [6]. We believe studying CareCall poses many opportunities to understand how AI-powered PI systems can be used for public health purposes and might impact the collaboration between public health officials and individuals. We are excited to discuss opportunities and challenges of leveraging AI-powered PI systems for public health purposes and ways to better design such systems for vulnerable populations including older adults in social isolation.

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