Aging in Place: Improving Homecare Services for Older Adults by Utilizing Companion Robots

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SOCIAL ISOLATION By the Numbers

More than
6.5 MILLION Americans
65 AND OLDER
are dealing with depression
on some level.
- National Alliance on Mental Illness.

OVER A QUARTER
of the U.S. population – and
28% OF OLDER ADULTS –
now live by themselves.
– U.S. Census Bureau.

A person who reaches the
AGE OF 65

2 IN 5 AMERICANS report that they sometimes or always feel their social relationships are not meaningful, and **1 IN 5** say they feel lonely or socially isolated.
- Brigham Young University.

The number of Americans
65 AND OLDER is expected to dou
between **2012 AND 2050**, and t
number of isolated seniors left at risk w
increase just as dramatically.
- Census.gov.


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Head(Touch Sensor)
Touch Interaction

Left & Right Ear
(Pressure Sensor)
Engagement Programs
(Workout, Quiz, Music, Story…)

Chest(Microphone)
Record Older Adults'
Voice Messages

Chest
(Motion Sensor)
Activity Detection
for Safety Monitoring

Left & Right Hand
(Pressure Sensor)
Touch Interaction

Back(Vibration Sensor)
Touch Interaction

MWC
GSMA

2024
GLOMO
Global
Mobile
Awards

Best Mobile Innovation for
Connected Health and Welling

Hyodol for AI Elderly Care Platform

Hyodol

US. FDA REGISTRATION CERTIFICATE

Owner: Hyodol Co., Ltd.

Initial Registration of Device Establishment and Device Listing

Establishment Operations: Manufacturer

Expiration Date: December 31, 2025

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Socially Assistive Humanoid Robots: Effects on Depression and Health-Related Quality of Life among Low-Income, Socially Isolated Older Adults in South Korea

Othelia E. K. Lee[1], Ilsung Nam[2], Yongho Chon[3], Albert Park[4], and Namkee Choi[5]

Abstract

Using a mixed-method study design, we examined the effects of a socially assistive humanoid robot (SAHR), called Hyodol, on depressive symptoms and health-related quality of life (HRQOL) of low-income, socially isolated older adults ($N = 180$). Quantitative outcomes were assessed at baseline (before Hyodol deployment) and at 3 and 6 months after baseline. Results showed reduced depressive symptoms and improved HRQOL at 3 months; however, these positive effects did not extend to 6 months. Ten focus group participants perceived Hyodol to be a valuable companion especially during the COVID outbreak. These results suggest that while Hyodol may have provided companionship for some low-income, socially isolated older adults during home confinement, its effects on depression and HRQOL were limited. Further research is needed to assess long-term effects of SAHRs as appropriate tools for reducing social isolation and improving behavioral health among community-dwelling older adults.

ASSISTIVE TECHNOLOGY
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Investigating the effectiveness of Socially Assistive Robot on Depression and Cognitive Functions of Community Dwelling Older Adults with Cognitive Impairments

Su Kyoung Kim[a], Jae-Won Jang, PhD[b], Yu Seong Hwang[a], Othelia EunKyoung Lee, PhD[c], and Heui Sug Jo, PhD[a]

applied sciences

MDPI

Article

Designing a Socially Assistive Robot to Assist Older Patients with Chronic Obstructive Pulmonary Disease in Managing Indoor Air Quality

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Abstract: Chronic obstructive pulmonary disease (COPD) stems from airflow blockage and lung damage, and indoor air pollution exacerbates COPD, underscoring the necessity for proactive management. Older COPD patients, prone to respiratory and heat-related issues, require crucial assistance, yet their reduced awareness necessitates ongoing education to identify and enhance indoor air quality. To tackle this challenge, we developed a socially assistive robot (SAR) integrating IoT air quality sensors to guide patients in improving indoor air quality (IAQ). This study evaluated IAQ enhancement among older COPD patients using this technology, uncovering a significant reduction in 'poor air quality alerts' with a clear linear trend. Although 'good alerts' remained consistent, machine learning models predicted improved air quality post-alerts. Consistent alerts serve as a motivating factor for patients to maintain IAQ standards. However, barriers to SAR utilization, such as psychological and operational hurdles, need to be addressed in future research endeavors.

The Novelty Effects in Usage

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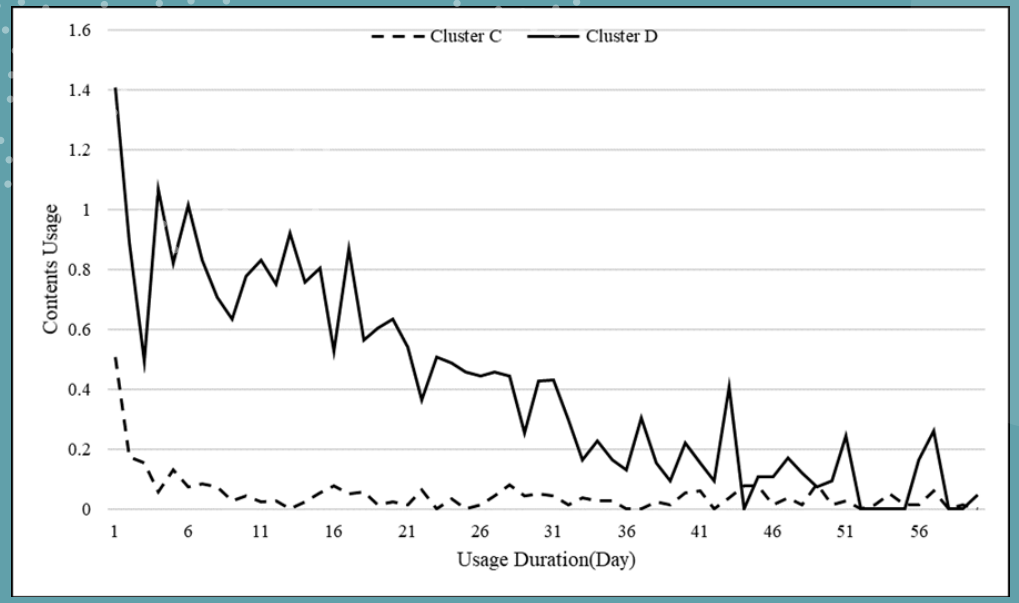
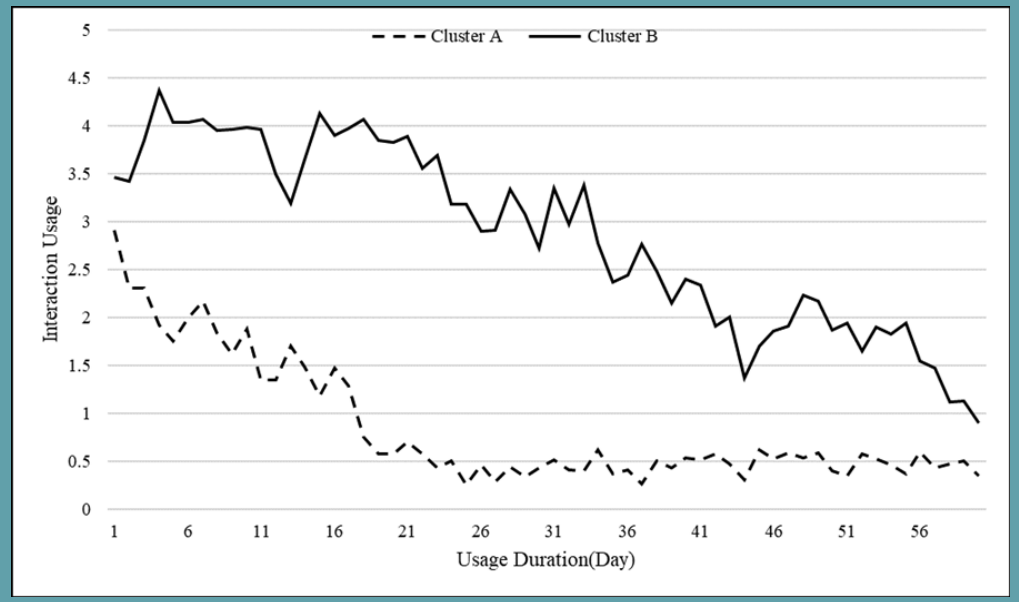
Preprints (earlier versions) of this paper are available at https://preprints.jmir.org/preprint/41093, first published July 14, 2022.

Investigating Older Adults' Use of a Socially Assistive Robot via Time Series Clustering and User Profiling: Descriptive Analysis Study

In-jin Yoo[1]; Do-Hyung Park[1]; Othelia EunKyoung Lee[2]; Albert Park[3]





CLINICAL GERONTOLOGIST
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My Precious Friend: Human-Robot Interactions in Home Care for Socially Isolated Older Adults

Othelia EunKyoung Lee PhD[a], Hyenjoo Lee PhD[b], Albert Park PhD[c], and Namkee G. Choi PhD[d]

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ABSTRACT

Objectives: Using a friendship framework, we explored interactions between a multi-functional companion robot and older adults residing in a low-resource community in South Korea.

Methods: We conducted in-depth interviews with 12 older adults who kept a doll-shaped companion robot called Hyodol for 18 months on average. We applied the Framework Analysis Method to explore three types of friendship (i.e., friendships of utility, pleasure, and the good) that participants cultivated with the robot.

Results: The most common aspect of utility companionship reported by all participants was Hyodol's role as their health coach who reminded them to take medication and to exercise. Participants also found pleasure in playing with Hyodol and reported reduced feelings of loneliness. In the absence of other social supports, all participants also regarded Hyodol as a surrogate family member or human-friend, and interacted with Hyodol as such.

Conclusions: Findings illustrated high acceptability of Hyodol among these socially isolated older adults especially during the global COVID-19 pandemic, suggesting that a humanoid like Hyodol could be complementary to homecare services for solo-living older adults.

Clinical Implications: Well-designed robot interventions, as complements to existing aging service and clinical interventions, have a potential to improve health behaviors among socially isolated older adults.

KEYWORDS

Aging; companion robots; socially assistive robots; social isolation; South Korea

friendship

Utility: Health Coaches

Pleasure: Playmates

The Good: Precious Friends

Study participants' interaction with Hyodol SAR






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Exploring the Use of Socially Assistive Robot Among Socially Isolated Korean American Older Adults

Othelia EunKyoung Lee[1], Kwi Ok Nah[2], Eun Mi Kim[3], Namkee G. Choi[4], and Do-Hyung Park[5]

Abstract

This pilot study explored whether a socially assistive robot (SAR) would have positive effects on Korean American immigrant older adults' health behaviors and emotional well-being and whether the older adults would be receptive to the SAR. A total of 30 participants (age 65+) in a large metropolitan area participated in the study, and each participant was provided a SAR named Hyodol for 4 months and interacted with it in ways that they saw appropriate. We used one-group pre- and post-test design to assess changes between baseline and follow-up in medication adherence, depressive symptoms, loneliness, and disability. Additionally, we employed in-depth qualitative interviews to explore participants' perceptions about the SAR. At post-test, participants showed improved medication adherence, reduced depressive symptoms, and a slightly and statistically nonsignificant decrease in loneliness scores. Qualitative data suggested high adoptability of this particular SAR among the participants.

Keywords

socially assistive robot, social isolation, medication adherence, depression, Korean Americans, older adults

	Pretest		Posttest					
	M	SD	M	SD	t	df	p	Cohen's d
MARS	3.89	.86	4.63	.54	-4.51	29	.000	.82
PHQ-9	8.73	5.38	5.00	5.19	3.41	29	.002	.62
UCLA-LS	20.80	12.92	18.03	14.40	1.48	29	.149	.21
WHODAS-12	17.57	11.69	17.23	14.38	0.15	29	.885	.02

anthropomorphizing


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1
HAPPY LIFE INC.
Age 78
Hyodol!
Way up high, way up high, a wide world!

App for caregivers

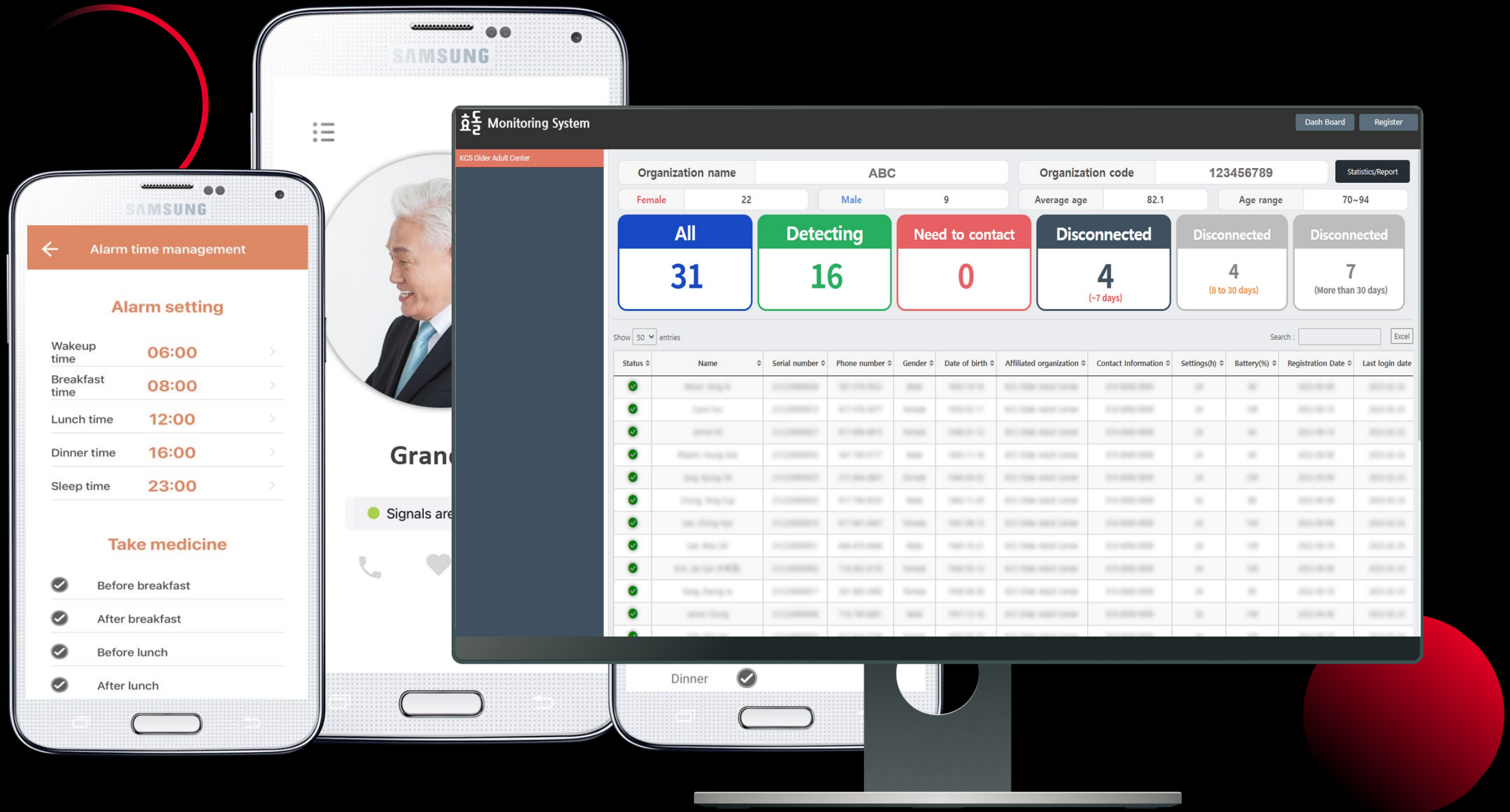
Social workers, homecare aid, nurse, occupational therapist, family

Robot

Older adults who live alone, reside in nursing homes, or attend daycare centers

Web monitoring system

Institution managers in local municipalities


SAMSUNG
Alarm time management
Alarm setting
Wakeup time 06:00
Breakfast time 08:00
Lunch time 12:00
Dinner time 16:00
Sleep time 23:00
Take medicine
Before breakfast
After breakfast
Before lunch
After lunch
Monitoring System
Dash Board
Register
KCS Older Adult Center
Organization name
ABC
Organization code
123456789
Statistics/Report
Female 22
Male 9
Average age 82.1
Age range 70~94
All 31
Detecting 16
Need to contact 0
Disconnected 4 (~7 days)
Disconnected 4 (8 to 30 days)
Disconnected 7 (More than 30 days)
Show 50 entries
Search :
Excel
Status
Name
Serial number
Phone number
Gender
Date of birth
Affiliated organization
Contact Information
Settings(h)
Battery(%)
Registration Date
Last login date
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Thank You

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Questions

- Is Hyodol in the US market? W
- hen will it be available?
- What are digital-literacy and AI-literacy required for older adults to utilize the socially assistive robots (SARs)?
- What are the advantages and disadvantages of human-robot interactions?
- How will it impact human-human interactions?

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