

Title: Healthcare Providers' perspectives on the adoption of Smart Care Technologies in Korean Long-Term Care Hospitals

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ABSTRACT

Background: Many smart care technologies have been developed recently, but it remains unclear which of them are necessary for use in long-term care hospitals (LTCHs).

Methods: A total of 114 physicians, registered nurses (RNs), nurse assistants (NAs), and care assistants (CAs) from eight LTCHs completed a survey assessing perceived needs for 10 smart care technologies using 5-point Likert scales. One-sample t-tests, one-way ANOVA with Scheffé post-hoc tests, Friedman tests, and simple linear regression were used to examine differences by occupation and hospital characteristics. Additionally, focus group interviews with 10 participants were done.

Results: Mean perceived need for smart care technologies was 3.99, with the highest ratings for smart mattresses (4.14), all-in-one patient transfer robots (4.09), and smart monitoring systems (4.06). Regarding the most preferred by occupation, physicians chose smart monitoring systems (4.19) and leg-care devices (4.19), RNs chose smart mattresses (4.11), NAs chose radar-based fall detection devices (4.22), and CAs chose all-in-one patient transport robots (4.36). Perceived need for smart care technologies was higher in LTCHs with lower monthly family fees and in those without a rehabilitation department, accounting for 42.8% and 10.8% of the variance, respectively.

Conclusion: Smart care technologies were seen as necessary in LTCHs, but the types of technologies considered most important differed by occupational role and hospital characteristics.

Key Words: Long-term care, Hospital, Health Personnel, Workload, Digital Health, Republic of Korea

INTRODUCTION

Korean long-term care hospitals (LTCHs) care for highly dependent older adults with severe frailty and a high prevalence of malnutrition.¹⁻³⁾ LTCH Care assistants (CAs), who provide most daily care, face workforce shortages, aging staff, and increasing reliance on foreign workers.^{4,5)} Unlike nursing homes, LTCHs lack legally mandated staffing standards and dedicated reimbursement for caregiving services.⁶⁾ This structural gap results in high patient-to-caregiver ratios, limiting the capacity to provide adequate and continuous care.⁷⁾ In this context, there is growing interest in using smart care technologies in Korean LTC settings to support care delivery and relieve frontline strain. One study report that healthcare providers perceive smart care technologies as potentially useful for reducing physical burden and improving care efficiency.⁸⁾ This growing interest is consistent with international developments, where the introduction of assistive and smart care technologies has accelerated in response to population aging and chronic staffing shortages in LTC settings⁹⁾. Examples include fall detection sensors, pressure ulcer prevention smart mattresses, automated transfer devices, digital continence management systems, and Artificial Intelligence (AI) enabled monitoring tools, which are designed to reduce preventable adverse events and alleviate repetitive physical tasks.^{10,11)} Qualitative research among nurses further indicates that, while the potential benefits of technologies such as smart mattresses are acknowledged, actual use in clinical practice depends heavily on usability, compatibility with workflow, and prior experience.¹²⁾

The Integrated Care Support Act, scheduled for implementation in March, 2026, represents a major policy shift aimed at overcoming the fragmented, facility centered structure of Korea's current LTC system. This legislation signals a transition from a treatment-oriented model focused on life prolongation to a community based, person-centered model that enables older adults to maintain dignity and age in place.¹³⁾ Such policy changes require new criteria for evaluating smart care technologies, emphasizing not only technical performance but also alignment with real clinical workflows, staffing

constraints, and the needs of frontline healthcare providers. These considerations parallel the broader gerontechnology literature, which highlights that successful adoption depends on user perceptions, organizational readiness, and the degree to which technologies address actual sources of work burden.¹⁴⁾

To the best of our knowledge, no previous study has examined occupation-specific preferences for smart care technologies across multiple LTCHs. Consequently, evidence remains limited regarding which categories of smart care technologies are perceived as most needed in LTCHs, how these preferences differ by occupation and institutional characteristics, and how work burden relates to these preferences. Although physicians, Registered Nurses (RNs), Nurse Assistants (NAs), and CAs perform distinct roles and experience different types and levels of work burden, no study to date has systematically examined how these occupation-specific burdens are related to perceived needs for smart care technologies in LTCHs. Clarifying these occupation-specific needs is essential for designing realistic, sustainable, and person-centered strategies for implementing smart care technologies.

To meet the growing care needs of an aging population, coordination between hospital- and community-based health, medical, and welfare services is essential.¹⁵⁾ In this context, 10 smart care technologies were included here: smart mattresses, all-in-one patient transfer robots, smart monitoring systems, radar-based fall detection devices, leg-care devices, CARE-net, wrist-worn bio-signal monitoring devices, large language model (LLM)-based dementia diagnosis tools, multimodal imaging devices, and smart diapers. These technologies align with the WHO's global strategy emphasizing digital solutions for continuous monitoring, early detection, and integrated care for aging populations.¹⁶⁾ Eight of these technologies addressed four key care domains in LTCHs: excretion management, pressure ulcer prevention, mobility support, and fall prevention. These domains were selected because they reflect common and clinically important care issues in LTCHs and are closely associated with nursing workload and patient safety risks.^{17,18)} In addition, the LLM-based diagnostic tool and CARE-net, a digital platform were specifically included to reflect the broader needs of integrated care.

This study aimed to examine healthcare providers' work burden and perceived needs for these smart

care technologies in LTCHs, and to explore how these measures differ according to occupation and hospital characteristics.

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METHODS

1. Study design and participants

This study utilized a survey supplemented by focus group interviews (FGIs) to examine HCPs perspectives on the introduction of smart care technologies in LTCHs. A quantitative survey was conducted to assess overall awareness, perceived need, and readiness regarding smart care technologies. Participants were recruited using convenience sampling from eight LTCHs located in different regions of Korea. To ensure diversity of the sample, participating hospitals were selected to reflect variations in bed capacity, geographic location (e.g., metropolitan and provincial areas), average monthly family fees, the presence of a rehabilitation service, and the proportion of single- and multi-bed rooms. Healthcare professionals working in these LTCHs, including physicians, RNs, NAs, and CAs, were eligible to participate in the study.

2. Survey on Perceived Needs and Work Burden

The structured online questionnaire used in this study was developed specifically to reflect the actual clinical environment of LTCHs. To ensure practical relevance, the survey items were derived based on a review of previous literature regarding routine care tasks and preliminary consultations with LTCH practitioners. The comprehensive questionnaire consisted of sections evaluating respondent demographics, basic dementia knowledge, work burden, and the acceptance of smart care technologies.

1) Preferences

The survey was conducted using a structured online questionnaire that assessed HCPs awareness, perceived importance, and preparedness regarding the implementation of smart care technologies. The survey was administered from 4 to 14 March 2025 to 114 healthcare professionals working in eight

LTCHs. Participants included physicians, RNs, NAs, and CAs from each LTCHs.

Survey items were rated on a 5-point Likert scale (1 = very low, 5 = very high).

The 10 categories of smart care technologies surveyed in this study were systematically selected to reflect the four critical domains mentioned above. They were as follows:

- **Smart mattress:** mattress having sensors to automatically perform patient repositioning, to preventing pressure ulcers.
- **All-in-one patient transfer robot:** A device designed to transfer patients from bed to wheelchair or toilet, preventing musculoskeletal disorders in CAs.
- **Smart monitoring system:** A monitoring display to check the patient's body temperature, heart rate, and overall status at a glance.
- **Radar-based fall detection device:** a device that Uses radar to detect falls instantly by recognizing patient movements as point clouds without cameras.
- **LEG-care device:** A rehabilitation robot (wearable or stationary) that facilitates leg exercises
- **CARE-net:** A central server and integrated mega-platform that aggregates all collected data (sleep, excretion, falls, vitals) to enables medical staff, guardians, and caregivers to monitor patient status collectively and links with the local community
- **Wrist-worn bio-signal monitoring device:** A device to track the patient's vital signs (temperature, heart rate) and real-time location.
- **Large language model (LLM) based dementia diagnosis tool :** A software technology where a LLM analyzes voice tone, vocabulary, and sentence structure to detect early signs of Alzheimer's or Mild Cognitive Impairment (MCI).
- **Multimodal imaging device:** a device Integrates thermal and depth sensors to precisely visualize health conditions and assess the severity of pressure ulcers.

- **Smart diapers:** that utilizes conductive sensors to detect excretion in real-time and visualize the status.

2) Work burden

Work burden was assessed using a four-item self-report scale developed for this study. Participants rated the extent to which they experienced (1) mental burden, (2) patient communication burden, (3) staff communication burden, and (4) family communication burden in their current work at LTCHs. Each item was rated on a 5-point Likert scale (1 = very low, 5 = very high), with higher scores indicating greater burden in that domain. For analyses, we used both domain-specific mean scores and an overall work burden score, calculated as the mean of the four items. Internal consistency of the four-item scale was excellent in this sample (Cronbach's $\alpha = 0.90$). However, formal content validity assessment and pilot testing were not conducted.

3. Focus Group Interviews

FGIs were conducted to explore participants' in-depth perceptions regarding smart care technologies. Participants were purposively selected from survey respondents who volunteered for the qualitative phase, ensuring representation across four occupational groups (Physicians, RNs, NAs, and CAs). A total of 10 participants took part across two sessions (five distinct participants per session), with each session conducted at a different LTCH.

The researcher moderated the sessions using a semi-structured questionnaire. The moderator encouraged balanced participation by prompting quieter individuals with follow-up questions while respecting non-responses. All sessions were audio-recorded with prior written informed consent.

For data analysis, the audio recordings were initially transcribed using an AI speech-to-text service (Naver Clova) and manually verified against the original audio by the researcher to ensure accuracy. Responses were then collated by each question. The researcher conducted a conventional content analysis to categorize these responses into broader themes.

4. Ethical considerations

This study was reviewed and approved by the Institutional Review Board of Chung-Ang University (IRB No. 104-2508-202409-HR-012). All procedures adhered to the ethical guidelines of the IRB and relevant privacy protection regulations. All participants received an explanation of the study purpose and procedures and then provided written informed consent. They were informed that they could withdraw from the study at any time without any disadvantage. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

5. Data analysis

We analyzed data using SPSS Statistics version 21.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participants' characteristics and their perception and preference scores for smart care technologies. To assess whether perceived work burden in each domain differed from the neutral point on the 5-point Likert scale, we conducted one-sample t-tests separately for each occupational group. Differences in work burden between occupations were then analyzed using one-way analysis of variance (ANOVA), followed by Scheffé post-hoc tests when the omnibus F-test was significant. A two-sided p-value <0.05 was considered statistically significant. To compare the perceived importance of smart care technologies according to occupation and hospital characteristics, we first performed one-way ANOVA and independent-samples t-tests. Because preference scores were

generally high across all professional groups and omnibus ANOVA F-tests for each technology were not statistically significant, we additionally examined within-occupation and within-hospital differences in rankings of the ten smart care technologies using the nonparametric Friedman test for related samples and Kendall's W coefficient of concordance. At the hospital level, exploratory simple linear regression analyses were conducted to identify predictors of overall technology demand. The overall technology Perceived needs score was set as the dependent variable, while institutional characteristics (presence of a rehabilitation department, average monthly family fee) served as independent variables. Standardized regression coefficients (β) and coefficients of determination (R^2) were reported.

RESULTS

Participant and hospital characteristics

This study included 114 healthcare professionals working in eight LTCHs across Korea. The sample consisted of 16 physicians, 53 RNs, 23 NAs, and 22 CAs. The majority of participants were female (84%). Detailed participant characteristics are presented in Table 1. The eight participating LTCHs showed substantial institutional heterogeneity. Bed capacity ranged from 132 to 524 beds (mean 279 ± 116), and five hospitals (62.5%) operated a rehabilitation department. Information on bed composition, rehabilitation services, and average monthly family fees is summarized in Table 2.

Overall perceived need for smart care technologies

The overall mean preference score across the ten smart care technologies was 3.99 out of 5, indicating a generally high level of perceived need. Among ten technologies, smart mattresses (4.14), all-in-one patient transfer robots (4.09), and smart monitoring systems (4.06) received the highest mean scores.

Work burden by occupation

Perceived work burden differed by occupational group (Table 3). Using the neutral midpoint of the 5-point Likert scale as a reference, physicians reported significantly higher burden across all four domains, including mental burden, communication with patients, communication with staff, and communication with patients' families (all $p < 0.01$). Among these domains, mental burden showed the highest mean score. RNs also reported significantly higher burden in all domains ($p < 0.001$), except for communication with staff ($p = 0.727$). CAs reported significantly higher burden in the mental domains only (both $p < 0.01$). NAs showed no significant deviation from the neutral point in most domains, although they reported a significantly lower burden in communication with staff ($p = 0.025$).

Occupational differences in technology preference rankings

A one-way analysis of variance (ANOVA) showed no statistically significant differences in mean preference scores for any of the ten smart care technologies across occupational groups (all $p > 0.05$), indicating similarly high overall levels of preference. However, analyses of within-occupation ranking patterns using the Friedman test revealed significant differences in technology prioritization among physicians ($\chi^2(9)=18.39$, $p=0.031$), RNs ($\chi^2(9)=24.07$, $p=0.004$), and CAs ($\chi^2(9)=27.32$, $p=0.001$). NAs showed a marginal trend toward significance ($\chi^2(9)=15.20$, $p=0.086$). Mean preference scores for each technology by occupation are shown in Figure 1. Physicians most highly ranked smart monitoring systems, leg-care devices, and CARE-NET. RNs ranked smart mattresses, CARE-NET, and all-in-one patient transfer robots highest. NAs showed the highest rankings for radar-based fall detection devices, smart monitoring systems, and wrist-worn bio-signal monitoring devices. CAs ranked all-in-one patient transfer robots, smart mattresses, and wrist-worn bio-signal monitoring devices highest.

Hospital-level variation in technology demand

At the hospital level, smart mattresses and all-in-one patient transfer robots consistently ranked among the top three technologies across all eight LTCHs, with smart monitoring systems or radar-based fall detection devices also appearing among the highest-ranked technologies in several hospitals (Figure 2). Exploratory regression analyses identified institutional characteristics associated with overall technology demand. LTCHs without a rehabilitation department showed higher perceived demand ($\beta = 0.329$, $p < 0.001$), explaining 10.8% of the variance ($R^2 = 0.108$). The average monthly family fee explained 42.8% of the variance in overall technology demand ($R^2 = 0.428$). Hospital-level contrasts were particularly evident between Hospital E and Hospital B. Hospital E, which had no rehabilitation department and the lowest monthly family fee, showed the highest overall

technology demand score (4.57). In contrast, Hospital B, which operated a rehabilitation department and had the highest monthly family fee, showed the lowest overall demand (3.49).

3. Insights from Focus Group Interviews

The FGI data provided qualitative depth to the survey findings, revealing that specific technology needs are directly driven by distinct occupational burdens. The qualitative findings are categorized into three distinct functional themes:

1) Physical Workload and Automation Needs

CAs emphasized the need to automate repetitive manual tasks to prevent musculoskeletal injuries. A CA noted, "Lifting heavy patients and repeatedly assisting with patient positioning during diaper changes are physically exhausting and prone to cause injury". Consequently, they strongly prioritized smart mattresses and patient transfer robots to mitigate this specific structural burden.

2) Patient Safety and Liability Concerns

Nursing staff (RNs, NAs) highlighted the severe mental stress associated with unexpected patient accidents. An RN stated, "Falls are not only dangerous but also cause immense liability-related stress and disputes with guardians". Thus, they advocated for continuous radar-based fall detection and smart monitoring systems to reduce reliance on intermittent visual checks.

3) Clinical Complications and Preventative Care

Physicians focused on preventing secondary clinical complications in bed-bound patients. A physician explained, "Missing the exact diaper change timing for severely contracted dementia patients quickly leads to severe eczema and skin damage". Therefore, they expressed a critical need for smart monitoring, smart diapers and bed-side rehabilitation devices (LEG-care) to maintain baseline physical health.

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DISCUSSION

To our knowledge, this is the first study to examine healthcare providers' perceptions of multiple smart care technologies in LTCHs using a survey supplemented by focus group interviews. Our findings suggest that distinct patterns of work burden across occupations are associated with different technology needs (e.g., decision-support technology is primarily required for Physicians, management technology for RNs, and robotics technology for CAs). First, physicians showed a high preference for the smart monitoring system, LEG-care, and CARE-net. This pattern may reflect the fact that physicians' work typically centers on assessing patients' medical status and making treatment decisions. Second, RNs most preferred the Smart Mattress, CARE-net, and the All-in-One Patient Transport Robot. This pattern may reflect the core components of nursing work in Korean LTCHs. Third, NAs preferred fall detection devices, Smart Monitoring, and Wrist-Worn Biometric Monitoring Devices. They provide routine daily care while simultaneously assisting nurses by performing ongoing observation, recording patient status, and executing basic treatments. This is interpreted as leading to a high preference for technologies that allow for the immediate detection of patient danger and tracking changes in medical status. Lastly, CAs preferred the All-in-One Patient Transport Robot, Smart Mattress, and wrist-worn biometric monitoring devices. CAs, who had the highest mean age among the job categories and were primarily responsible for high-intensity physical tasks such as patient transfer, diaper changes, and repositioning for pressure ulcer prevention, reported the greatest physical fatigue.

Importantly, the qualitative FGI findings significantly extended these quantitative survey results by providing the contextual mechanisms behind the occupation-specific technology preferences. While the quantitative data established the statistical trends between high work burdens and specific technology needs, the qualitative data explained the why. For instance, while the survey demonstrated that CAs highly prioritized transfer robots and smart mattresses, the FGIs extended this by revealing that this preference is not merely about general fatigue, but a strategic response to the repetitive physical strain

of managing patient restraints during diaper changes. Similarly, the high mental burden reported by RNs quantitatively was qualitatively contextualized as liability-related stress concerning fall accidents, which perfectly explains their strong demand for continuous smart monitoring.^{19,20)} Ultimately, the qualitative data did not challenge the quantitative findings, but rather enriched them, demonstrating that technology needs in LTCHs are driven by specific, structural clinical risks rather than simple convenience.

At the LTCH level, the pervasive decline in inpatients' ADLs necessitates preventive strategies.²¹⁾ As shown in Figure 2, smart mattresses, all-in-one patient transport robots, and smart monitoring systems consistently occupied the top tier of preferences across hospitals. This pattern likely reflects the clinical profile of LTCH inpatients, many of whom are bed-bound or have severe mobility limitations; consequently, healthcare providers showed particularly strong interest in technologies that can prevent pressure ulcers, support safe transfers between bed and wheelchair, and enable continuous monitoring at the bedside.

Taken together, these findings suggest that, in our sample of eight LTCHs, ward environment and cost structure may be more salient contextual factors for technology demand than the mere presence of a rehabilitation department. Although hospitals without a rehabilitation service tended to show higher demand in the regression analysis, Hospital E and Hospital B illustrate that “high-density, low-fee” versus “low-density, high-fee” configurations may shape staff perceptions more directly. Hospital E combined the lowest monthly family fee with an exclusively multi-bed ward structure and showed the highest overall technology demand, whereas Hospital B combined the highest monthly family fee with a relatively high proportion of private or semi-private rooms and showed the lowest demand. This contrast is consistent with the interpretation that crowded multi-bed environments and lower reimbursement levels may heighten concerns about workload and safety, increasing the perceived need for physical assistive technologies, while settings oriented toward more individualized care with higher per-patient fees may perceive less immediate pressure to adopt such technologies. However, these

hospital-level analyses were exploratory and based on only eight facilities, and the observed associations should therefore be interpreted with caution.

Overall, these findings may be interpreted using concepts drawn from technology acceptance and implementation theories, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT).²²⁾ Across both the quantitative and qualitative findings, smart care technologies were more likely to be valued when they were perceived as useful for reducing care burden and supporting safer care in everyday practice.²³⁾ At the same time, adoption in LTCHs may depend not only on this perceived usefulness but also on facilitating conditions, such as staffing, budget, training, and organizational readiness. In this respect, technology demand in LTCHs appears to reflect both frontline clinical needs and the broader institutional context in which care is delivered.

This study has several limitations that should be considered when interpreting the findings.

First, the sample size was modest and based on convenience sampling of eight LTCHs. Second, most participants had limited or no direct experience with several of the smart care technologies evaluated in this survey. Subsequent research should examine changes in work burden and attitudes before and after real-world implementation of specific technologies in LTCH wards. Third, data were collected through a cross-sectional, self-administered online questionnaire, which is subject to self-report bias and social desirability effects. Fourth, although our questionnaire demonstrated adequate internal consistency, the work burden scale was newly developed for this study and did not undergo formal psychometric validation, including content validity assessment, pilot testing, or construct and criterion validity testing. Therefore, the work burden scores should be interpreted with caution as exploratory measures. Finally, the study focused on physicians, RNs, NAs, and CAs and did not include other key stakeholders; future research should incorporate a broader range of professional roles across different LTC systems.

CONCLUSION

Healthcare providers in Korean LTCHs reported a high perceived need for smart care technologies, particularly prioritizing smart mattresses, all-in-one patient transfer robots, and smart monitoring systems. While overall demand was higher in institutions with lower fees and no rehabilitation services, specific technology preference rankings differed significantly by occupation according to their distinct work burdens.

Declaration of a Conflict of Interest

The researchers claim no conflicts of interest.

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AUTHOR CONTRIBUTION

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TABLE1. Healthcare Providers' Characteristics(n=114)

	Total(%) (N=114)	Physicians (N=16)	RNs* (N=53)	NAs** (N=23)	Care assistants (N=22)
Age(y)		48.3(39-63)	43.9(24-68)	54.7(43-72)	56.9(31-79)
Gender					
Men	18(15.8)	11	1	0	6
Women	96(84.2)	5	52	23	16
Nationality					
Korean	110(96.5)	16	53	23	18
Foreigners	4(3.5)	0	0	0	4
Marital status					
Married	76(66.7)	11	36	18	11
Single	29(32.4)	4	17	5	11
Non answer	1(0.9)	1	0	0	0
Employment type					
Full time	93(81.6)	16	53	21	3
Temporary	21(18.4)	0	0	2	19
LTCHs*** Career(y)		15.1±7.99	12.6±10.83	6.7±4.55	4.7±5.22
Job Satisfaction****		4.1±0.85	3.6±0.69	3.7±1.02	3.4±0.78

*Registered Nurse, **Nurse Assistants ***long-term care hospitals **** Job Satisfaction is measured using a 5-point

Likert scale, from 1: Not at all to 5: Very much.

TABLE2. LTCHs Characteristics(n=8)

Hospital	Total Beds #	Beds type(beds#/room)			Rehab*	Monthly family fee(USD)
		1-2	3-5	6-		
A	230	17	5	30	X	2,721
B	524	131	11	57	O	10,492
C	180	28	38	0	O	2,798
D	132	0	0	18	X	909
E	299	0	0	43	X	769
F	292	21	25	7	O	3,148
G	290	10	1	53	O	2,518
H	300	5	29	35	O	2,658

*Rehabilitation service

TABLE3. Healthcare Providers' work burden

H.Provider		Physicians	RNs**	NAs***	Care assistants
Burden*					
Mental Patient Communication with Staff Family		Very high 4.5±0.51(t=11.619, p<.001)	High 3.84±0.88(t=6.979, p<.001)	Not significant 3.39±1.11(t=1.679, p=.107)	High 3.63±0.84(t=9.139, p=.002)
		High 4.31±0.47(t=10.967, p<.001)	High 3.75±0.97(t=5.614, p<.001)	Not significant 3.08±0.94(t=0.439, p=.665)	Borderline 3.36±0.84(t=2.012, p=.057)
		Significantly high 3.81±0.75(t=4.333, p=.001)	Not significant 3.03±0.78(t=0.351, p=.727)	Low 2.6±0.78(t=-2.398, p=.025)	Not significant 2.81±0.66(t=-1.283, p=.213)
		High 4.12±0.71(t=6.260, p<.001)	High 3.56±0.84(t=4.884, p<.001)	Not significant 2.95±0.97(t=-0.214, p=.833)	Not significant 2.86±0.56(t=-1.142, p=.266)

*The burden scores were measured using a 5-point Likert scale, from 1: Not at all to 5: Very much. **Registered Nurse,

***Nurse Assistants

Figure 1. LTCHs Healthcare Providers' perceived needs for smart care technologies

(A) Among physicians, the highest perceived needs were observed for smart monitoring systems (4.19), leg-care devices (4.19), and CARE-NET (4.13). (B) Among Registered nurses (RNs), the highest perceived needs were observed for smart mattresses (4.11), CARE-NET (4.02), and all-in-one patient transport robots (4.00). (C) Among Nurses Assistants (NAs), the highest perceived needs were observed for radar-based fall detection devices (4.22), smart monitoring systems (4.17), and wrist-worn biosignal monitoring devices (4.13). (D) Among Care assistants, the highest perceived needs were observed for all-in-one patient transport robots (4.36), smart mattresses (4.32), and wrist-worn biosignal monitoring devices (4.27). Scores were measured using a 5-point Likert scale from 1 (not at all) to 5 (very much).

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Figure 2. Perceived needs for smart care technologies of each LTCH

Mean perceived need scores for ten smart care technologies across eight long-term care hospitals. Colored lines (A–H) represent perceived need scores reported by each hospital, and the gray vertical bars indicate the overall ranking of technologies based on the mean scores across all hospitals. Scores were measured using a 5-point Likert scale from 1 (not at all) to 5 (very much).

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