The Journal of Nursing Home Research Sciences
Volume 6, 2020

Jour Nursing Home Res 2020;6:73-77
Published online September 11, 2020, http://dx.doi.org/10.14283/jnhrs.2020.20

HEALTH INFORMATION TECHNOLOGY USE AMONG NURSING ASSISTANTS IN LONG TERM CARE: A USER STUDY OF A TOUCH SCREEN POINT OF CARE SYSTEM

R. MEEHAN

Corresponding author: Rebecca Meehan, Ph.D. Associate Professor, School of Information, Kent State University, 1125 Risman Rd., Kent, OH, USA 44242, RMeehan3@kent.edu, 330-672-9715

Abstract: *Background:* As health information technology (IT) sophistication evolves in long term care (LTC) facilities, it is critical to understand the user experience of health IT among all LTC caregivers to support their roles in providing quality care. *Objectives*: To examine the end user's (nursing assistants) experience of a newly implemented wall-mounted, touch screen point-of-care (POC) system in a LTC facility in the mid-western United States. *Design:* This study used a descriptive qualitative method to conduct a user experience study. *Setting:* The study site was a chain-affiliated, non-profit continuing care retirement community in the Midwest United States, with 79 skilled nursing facility beds licensed for LTC and 29 beds licensed for rehabilitation. *Participants:* This purposive sample included state tested nursing assistants (NA) (n=25), representing all three work shifts (day, afternoon, and night). *Measurements:* Measures included a semi-structured one-on-one interview and a short questionnaire using both closed ended and open ended questions to examine the user experience of the new health IT in terms of 1) usability, (2) overall evaluation (what is working, what is not, what can be improved), and (3) whether the POC has helped staff members to provide better care. *Results:* Nursing assistants reported satisfaction with the system, ease of use, and a more effective data capture experience than compared to using a paper chart. Most respondents agreed that the POC helped staff to provide better care. Respondents voiced concerns in areas of how best to configure the POC system and best practices on how to use the system more effectively going forward. *Conclusions:* Optimizing the user experience of health IT among NA staff can affect clinical outcomes for LTC residents. Recommendations for improvements include improved usability to ensure data is captured efficiently, enhanced and more frequent training for accuracy, ergonomic adjustments for reaching the screen and entering data without injury, and modifications to protect resident health information privacy.

Key words: Health Information Technology, nursing assistant, long term care

Introduction

As long term health care (LTC) settings continue to expand their use of health information technology (IT), it is important to examine the user experience of all health IT end users in order to understand what is working and what needs to be improved in the evolving health IT ecosystem. Health IT solutions can play a part in making the documentation process more efficient, effective and better overall for residents and staff but this has been a gradual process for LTC settings (1, 2) with roughly 67% of LTC facilities having adopted electronic health records (EHRs) as of 2017 (3, 4). EHRs and other health IT systems provide opportunities to improve quality of care for older adult residents, through improved and more efficient communication both within LTC facilities and between the LTC and referring hospitals (2, 5, 6). Alexander and colleagues (2017) explored health IT sophistication in LTC and found IT capability was greater than IT extent of use in all health domains, the highest being in residential care. Other studies of health IT use in LTC settings have shown that having the health IT system or capability does not mean that it is being used consistently, and to its intended benefit (5). To better develop the extent of use, it is important to examine how end users are interacting with health IT. While studies have examined the use of health IT in long term care (2, 5-11); few studies have focused on the user experience of nursing assistants in health IT.

Nursing assistants (NA) are the front-line health care workers who are attending to daily care needs of the older adult residents of long-term care who have physical and/or cognitive challenges making it difficult to take care of themselves. NAs use health records, health IT and communication with nursing staff to be informed about each resident, and to communicate updates on residents' health status to the extended care team. LTC settings introducing new health IT systems for NAs need to ensure that the systems are easy to use and helpful in NA daily responsibilities while promoting better care for their residents.

This study focuses on the user experience of NAs working in a LTC short term rehabilitation and LTC units, both of which had installed a new wall mounted, touch screen point of care (POC) system on which NAs recorded data from daily care they provided to each resident, replacing a long-used paper flow sheet system.

Received June 10, 2020
Accepted for publication July 29, 2020

Methods

This study uses a descriptive qualitative method, incorporating both a semi-structured one-on-one interview and a short questionnaire to examine the end users' (NAs) experience of a newly implemented (in the past 8 months) POC in a LTC facility. NAs are required to enter vitals and other patient care information from daily care rounds for residents into the POC system, which is automatically uploaded to the EHR for review and care coordination with other care team members. The POC system replaced the former hand-written paper flow sheets previously used by NAs. A descriptive qualitative method can be used to describe an event in the everyday terms of the event (12). The descriptive qualitative method is useful in the healthcare research as it allows a focus on the experience of health care stakeholders and their description of a phenomenon in the health care setting (13). The questionnaire used both closed ended and open-ended questions, which has been shown to be an effective strategy when assessing user experience of new technology or software (14).

Closed ended questions asked in the questionnaire help to provide background on how much experience participants had with technology, how long they had worked in their current job, in LTC in general, as well their assessment of the user experience of the POC system. Usability of the POC system was measured using items adapted from the task, user, representation and function (TURF) framework (15) by asking respondents (using the 5-point Likert-type scale) to what extent the system was easy to use and satisfactory. Open-ended questions in the interview asked respondents to describe their experiences of the wall mounted POC screen in three areas: (1) usability, (2) overall evaluation (what is working, what is not, what can be improved), and (3) whether the POC has helped staff members to provide better care.

Sample

This purposive sample included NAs (n=25), on all three shifts, working at a dual-licensed skilled nursing and rehabilitation unit, housed within a chain-affiliated, non-profit continuing care retirement community in the Midwest United States. The study site has 79 skilled nursing facility beds licensed for LTC and 29 beds licensed for rehabilitation. Inclusion criteria for participation in the study were employees at the study site who are state tested nursing assistants (NA) who work directly caring for patients and who enter data in the POC wall mounted system. The author recruited participants by displaying a poster describing the study in the staff break room, along with flyers in NA mailboxes. The response rate for the study was 83%, with 30 nursing assistants meeting inclusion criteria, and 25 agreeing to participate. Informed consents were obtained from participants, with participants receiving a $10 gift card to a local grocery store. Interviews, conducted during a meal or break time, averaged 17 minutes, ranging from 10 –28 minutes. Interviews were audio recorded with the participants' permission. Interviews were then transcribed and analyzed for themes and patterns.

Analysis

Content analysis was used to evaluate data from respondents, aligned with the qualitative descriptive method (16). The investigator and two research assistants, all of whom are trained in qualitative data analysis techniques, followed a process of (a) coding data from notes and interviews; (b) recording insights and reflections from the study; (c) identifying patterns, phrases, and important features; (d) reconciling elements consistent across data; and (e) assessing these patterns in the context of the related literature. Intercoder reliability was achieved through "negotiated agreement" (17) by using a process in which the research team members coded a transcript, compared codes, and then discussed any differences to reconcile them for a final coding solution.

Results

Sample Characteristics

As a group, respondents had a wide range of experience working in long-term care settings, averaging 5 and ½ years working onsite. The turnover of NAs at the study site was lower than national averages, with respondents having an average of 4 years of employment at the study site and ranging from 6 months to 16 years. All respondents are women. Respondents were well acquainted with basic touch screen technology, with most all respondents (n=22) having experience on personal computers and smart phones, with some of the newer hires to the facility having more daily experience using smart phones for communications and transactions than those who had been at the facility for a while. Most respondents (N=21) reported they spend about 20% of their shift using the POC system.

Usability

Respondents were asked how easy the system was to use (1 = very difficult to 5 =very easy). Most respondents rated the system as "easy or very easy" to use (n=22). One respondent said "I mean it's pretty self-explanatory…it has answers right there. You just have to click it." Respondents were asked how satisfied they were with the POC system (1 = very dissatisfied to 5 =very satisfied). Most (n=23) were either very satisfied or satisfied. Several users (n=7) commented on ways to improve the usability and saying that the POC system currently needs "too many clicks'" to get to a certain page of a resident's information.

What is Working Well and What Needs Improvement

Respondents were asked an open-ended question about what was working well and what was not or could be improved in the POC system. Themes of the responses included a) ergonomic

Table 1
Sample Characteristics

Variable	Average	Range
1.Experience working in LTPAC settings	5.5 years	6 months – 25 years
2. Length of employment at study site	4 years	6 months – 16 years
3. Do you have experience with personal computers/ touch screen devices away from work?	Yes (n=22) No (n=3)	
4. What is the percentage of time spent using POC during your shift?	20% of shift (n=21) 40-50% of shift (n=3) 60% of shift (n=1) 90% of shift (n=1)	

issues, b) privacy, c) efficiency, and d) training.

a) Ergonomic issues were mentioned as an area for POC improvement by several respondents. Many respondents (n=5) mentioned the need to have the touchscreen monitor mounted lower on the wall, because it became more of an effort to reach for some people. One respondent said: "…I have problems touching the screen with my hand; after a while it begins to hurt." Some respondents (n=3) offered an alternative to the wall mounted unit, suggesting a monitor on a desk or cart instead of on the wall for both ergonomic and privacy concerns. Some respondents (n=4) mentioned that the wall placement was helpful to have one less thing to carry, bridging both ergonomic and efficiency benefits.

b) Some (n=5) were worried about maintaining residents' privacy, because POC data is entered on the large wall mounted screen in a common hallway. While there were visual protections to prevent people from viewing the information from the sides, it was still visible if someone was standing behind the NA. One respondent shared: "…it's a privacy thing because you put in the information you have, and people [are] walking past, seeing what you are putting in [the POC] ." Another respondent mentioned that she "…found it awkward to have to tell someone in the hallway to look away from the screen," to protect the resident's privacy, so, often, she would just continue to add the information, trying to block information by moving, but not saying anything to passersby.

c) A few respondents (n=4) mentioned that when they enter in information on vitals or other health information, the screen information often lags, taking more time than expected to show that the data was saved. This time lag led to confusion as to whether the data was captured, and overall frustration with the process. One respondent said "…when it goes slow, it doesn't work well for anybody because we're all standing there charting on one person. We have a big facility and if it's just two people on a floor and we're charting on one person and it takes ten minutes, you have two lights going off and then by the end of the day, you only charted on like six people. That was in an hour and we still have six more people to chart on. Those are the days that we wish we would have had the [paper] book instead." Beyond being slow occasionally, the POC system sometimes 'froze' resulting in potential data inaccuracies because of the lag time between care given and documentation of that care. Some conveyed that if a system froze, they would go to another unit on another hallway to add data, but this caused a delay for the other nursing assistants assigned to that hallway.

d) The facility offered a 30-minute initial training on the wall mounted POC software, with refresher courses offered every 2 to 3 months. Although all respondents indicated that the training was adequate, they commented that they would welcome additional training sessions. One respondent suggested that it could have been explained better if the training session was broken up in different groups, with one group of experienced computer users, and another group with limited experience on computers. Beyond technical training, respondents voiced concern over the need for NAs to get periodic training on how to accurately document care. Several respondents conveyed a frustration over being able to correctly document care issues for the resident by both themselves and their co-workers. One respondent said: "Right now [for food eaten] the values go from zero. I think it says none and then it's zero to 25, 26 to 49, 50 to 70 and then 75 to – it's a big difference for someone with diabetes to show if they eat nothing to a little bit." In terms of transfer assistance, charting the wrong classification for the resident's care can create a situation where the next care team member is physically unprepared to transfer the resident and may need more help. One respondent described her co-worker's confusion over how to characterize the dependence level of a resident when it comes to transferring the resident between a chair and bed. She said: "…when someone [needs] a Hoyer we used to put [document] that as an 'extended assist' function but in reality because it's a Hoyer lift…we have to list that person as 'total dependence'… I think that was a big question about the terminology." Some respondents conveyed that they need other more specific levels of classification. Another respondent, who had worked at the facility for many years, added "I'm not going to lie, sometimes I still get confused with

limited and extensive [assist]."

Does the POC Help Staff to Provide Better Care

Most (n=17) of the respondents agreed with the statement that the POC helps them provide better care to their patients, explaining that it is because they have better access to patient information. One respondent said "… it's very useful, because it gives me the [resident] profile… I know how they transfer… there's nothing going to slip by me on this person." Some (n=3) mentioned the advantage in no longer having to rely on asking nurses for patient related information since they have the information in the POC system. One respondent works on all different units shared "…[be]cause I'm a 'float', meaning like I get thrown on every hallway possible; I'm downstairs, I'm upstairs, I'm everywhere. So if I was given a report by an aide that didn't really tell me much about the person I could just go in the computer [POC] and look at the patient records and figure out how they transferred, if they got dementia…It helps me walk into the room and [prepare] myself better to them because I understand them now."

Discussion

When LTC facilities install new health IT for NAs, there is necessary preparation, integration and on-going monitoring and maintenance to do in order to derive the proposed value of such a system. The POC system helped NAs to gain insight into the changing needs of their residents and communicate updates to other care team members in an efficient and effective manner. Consistent with research on use of health IT in LTC settings, effective use of the POC system for NAs demonstrates an organizational culture that is receptive to innovation and one that is open to leveraging health IT across care team (6). Findings of this study showed a setting with higher health IT sophistication (8) because the POC system operated by the NAs was used extensively and was integrated into the daily care routine. Aligned with other studies (9, 10) many respondents in the study indicated that the POC system allowed them to get relevant information about the residents, without having to communicate directly with nurses, making the process more efficient.

Specific recommendations for implementing a touchscreen, wall mounted POC system include concerns for ergonomic design, usability, privacy, training on system use and ongoing training on care documentation as these all influence quality of patient care and user/employee satisfaction. Findings from the study suggest further consideration of ergonomic and privacy issues of the POC. The height of any wall mounted data entry screen needs to be adjustable to accommodate the differing physical heights of the NA staff members, ensuring that all staff can reach and use the screen comfortably. In terms of usability, the POC system should be updated to provide feedback to the user on the status of the system (18), allowing the user to know if the system has frozen, and they need to restart the data entry or if the POC is registering the data and just taking a longer time. Regarding privacy, the POC system did not prevent viewing from people who could observe an NA in the hallway entering data, putting NAs in a difficult position, as respondents voiced concerns around how to keep information private. Their distress over privacy also shows that NAs have limitations on what they can do if someone is standing over their shoulder as they enter data. Policies or procedures need to be reconsidered around how best to protect resident's personal health information when NAs are entering data on screens in the hallway with other passersby present. Training needs to include interpretation of coding and documenting health status, rather than only the technical aspects of how to use the POC system. When respondents discussed their experiences in documenting care, many were confused about how to document the amount of food residents consumed, and the extent of assistance needed by residents when transferring from their bed or chair. In a like manner, many discussed not being clear on how to document a resident's need for assistance when transferring from a bed or chair. Issues with documentation cascade and affect care and preparedness to lift residents, contributing to the threat to LTC worker safety (19). NAs, physical therapists and other staff members who need to lift, transfer and move residents safely rely on the accuracy of this information to help keep themselves and the residents safe.

This study is one of few examinations of health IT use among NAs in LTC settings. Future research should examine POC and related health IT use among NAs at other LTC sites, as well as user research among other interdisciplinary care team members. Moreover, future research should evaluate time savings in care tasks using new health IT. As health IT sophistication increases among LTC sites, the evolution of their organizational culture will depend not only on evaluations of how all stakeholders are interacting and using health IT systems, but also how well adjustments and corrections can be implemented to optimize use of the systems and to improve care.

Funding: Funding for this project was provided by the author's university.

Conflict of interest: No conflict of interest.

Ethical standards: Institutional Review Board (IRB) of Kent State University approved this research protocol.

References

1. Kruse, CS, Mileski, M, Vijaykumar, AG, et al. Impact of Electronic Health Records on Long-Term Care Facilities: Systematic Review. JMIR Medical Informatics 2017; 5(3):e35. https://doi.org/10.2196/medinform.7958
2. Rantz, M, Alexander, G., Galambos, C, et al.The use of bedside electronic medical record to improve quality of care in nursing facilities: a qualitative analysis. Comput Inform Nurs. 2011, Mar, 29(3):149-56.
3. Alvarado C, Zook K, Henry J. Electronic health record adoption and interoperability among U.S. nursing facilities in 2016. 2017, ONC Data Brief, 39:1-10.
4. Henry J, Pylypchuk Y, Searcy T, et al. Adoption of Electronic Health Record Systems among U.S. Non-Federal Acute Care Hospitals: 2008-2015. 2016, ONC Data Brief, 35.
5. Meehan, R, Transitions from acute-care to long term care: Evaluation of the continued access model. Journal of Applied Gerontology, 2018, 38(4): 510–529.

6. Vest, J.R., Jung, H. Y., Wiley, K, et al, Adoption of Health Information Technology Among US Nursing Facilities. JAMDA, 2019, 20 (8):995-1000 e4.
7. Meehan R. Electronic Health Records in Long-Term Care: Staff Perspectives. J Appl Gerontol. 2017;36(10):1175-1196. doi:10.1177/0733464815608493.
8. Alexander GL and Wakefield DS. IT sophistication in nursing homes. J Am Med Directors Assoc. 2009,10(6):398–407.
9. Alexander GL, Pasupathy KS, Steege, LM, et al. Multidisciplinary communication networks for skin risk assessment in nursing homes with high IT sophistication. Int J Med Inform 2014, 83(8): 581-591.
10. Alexander G, Madsen, Miller E, et al. A national report of nursing home information technology: year 1 results, Journal of the American Medical Informatics Association 2017, 24:67–73.
11. Alexander G, Steege L, Pasupathy K, et al. Case studies of IT sophistication in nursing homes: a mixed method approach to examine communication strategies about pressure ulcer prevention practices. Int J Industrial Eng. 2015, 49:156–166.
12. Sandelowski M. Whatever happened to qualitative description? Res. Nurs. Health 2000,23: 334-340.
13. Neergaard MA, Olesen F, Andersen, RS, et al. Qualitative description – the poor cousin of health research?. BMC Med Res Methodol 2009,9, 52.
14. Farrell, S. (2016). Open-Ended vs. Closed-Ended Questions in User Research. Nielsen Norman Group. https://www.nngroup.com/articles/open-ended-questions/. Accessed 1 May 2020.
15. Zhang J, Walji MF. TURF: toward a unified framework of EHR usability. J Biomed Inform. 2011, 44:1056-1067.
16. Miles MB and Huberman AM. Qualitative data analysis—An expanded sourcebook. 1994. Thousand Oaks, CA.
17. Campbell JL, Quincy C, Osserman J, et al. Coding in-depth semi structured interviews: Problems of unitization and intercoder reliability and agreement. Sociological Methods & Research, 2013,42: 294-320.
18. Lowry S, Ramaiah M, Patterson E, et al. Technical evaluation, testing, and validation of the usability of electronic health records: Empirically based use cases for validating safety-enhanced usability and guidelines for standardization. 2015, NIST.IR 7804-1, National Institute of Standards and Technology.
19. Lapane K, Dubé C, Jesdale B. Worker injuries in nursing homes: Is safe patient handling legislation the solution? Journal of Nursing Home Research, 2016, 2:110-117.