

Digitalization in Public Care – Consequences on Workflow and Attitudes Among Care Givers and Older Adults

Marie Sjölander and Ann-Sofie Mårtensson

RISE Box 1263, SE-164 29 Kista, Sweden

ABSTRACT

This paper describes a qualitative study with the aim to get a deeper understanding of opportunities and challenges related to digitalization within two Swedish municipalities. Employees with different roles in the organizations were interviewed based on concrete examples of digitalization from within their own organization. They were asked questions about how and to which extent the implementation of the digital solutions has changed work-related behavior, and about attitudes towards technology and older adults as technology users. The technology that was implemented was in one of the municipalities digital night supervisions by camera and in the other municipality an app for conducting physical exercises. Both implementations demanded changes in workflow and knowledge about the technology among personnel and the care takers. Insights from the technology implementations are presented and discussed in terms of effect on workflow and attitudes towards technology

Keywords: Digitalization, Technology implementation, Older adults and technology usage, Welfare technology, Remote supervision, Digital tools

INTRODUCTION

To be able to meet the demographical changes and the increasing demand on resources within elder care, new digital tools are needed to an increasing extent. Implementation of new digital services demand both changes in workflow and skills in using the digital services. The feeling of being included in the process and time given for learning and introduction could affect how new digital tools are perceived by the personnel; and time and resources for learning and support could vary between municipalities and between units within the same municipality (Sjölander and Mårtensson, 2021). There are also many assumptions and negative stereotypes regarding aging (Lagacé et al., 2015; McDonough, 2016) and about older adults as users of new digital services (McDonough, 2016; Lagacé et al., 2016). However, many older adults today have experience from using technology and are in general positive to start to use new digital services, but as in the case with the personnel, the learning context and the time that is provided are important (Sjölander and Mårtensson, 2021; Broady et al., 2010). When new digital tools are provided to the

older adults by the municipality, the learning context might also be affected by the care givers time and engagement, which in turn could affect the older adult's motivation to use the technology and their perception of themselves as technology users.

Since both resources are limited and since it is important how new digital services are introduced to the personnel and to the older adults, more in-depth knowledge is needed regarding which aspects that needs to be given the largest focus. This paper describes a qualitative study with the aim to gain a deeper understanding of opportunities and challenges related to digitalization within two municipalities. The focus was on how new digital tools have been implemented in the organizations, in terms of how and to which extent the implementation of the digital solutions had changed work-related behavior, and attitudes towards technology and older adults as technology users.

METHOD

In the study, employees from two municipalities participated. The employees were managers at different levels and employees working close to the care takers. The participants were interviewed based on concrete examples of digitalization from within their own organization. In one of the municipalities the technology was night camera supervision, and in the other municipality it was an app for conduction physical exercises. The participants were asked questions about how it had affected the way the personnel thought about organizational changes and changes in workflow related to new digital tools, and about how the technology had been received by the personnel and the older adults. Questions were also asked about how the implementation of the technology had affected attitudes towards new digital solutions among the care givers and the caretakers. Finally, the participants described, their own previous insights and general thoughts related to implementation of new technology.

In total eight participants were interviewed. The participants from the municipality that had implemented digital night supervision via camera were: two section managers; one assistance officer; and two from the night patrol (one coordinator and one installer). The participants from the municipality that had implemented the app for physical exercise were: one business area manager; one project manager; and one assistant nurse. Notes were taken during the interviews. The results from the interviews are presented below in sections 3 and 4.

DIGITAL NIGHT SUPERVISION VIA CAMERA

Night supervision via camera was introduced in the municipality 2019 to 2020 and was completely in usage 2021. The introduction and the implementation went fast due to the urgent need caused by the pandemic and the importance of reducing the number of physical contacts. Initially around 15 cameras were placed in the caretakers' homes, in three weeks all cameras were in operation. An alarm center was responsible for the supervision, the camera switched on at predefined times, if the caretaker could not be seen

(was out of the bed) the operator had a further check after 10-15 minutes. If the caretaker was not visible the second time, an alarm was sent to the night patrol that conducted a physical visit.

It was the assistance officer that granted the night supervision. In a second step, the care giver and the caretaker together decided if the supervision should be digital or physical. During the pandemic the guideline for granting support by the assistance officer was changed from night supervision to digital night supervision. This, to reduce the number of physical encounters.

Starting to use the Technology

Implementing digital night supervision was described as a step in the right direction since the value of physical visits during the night was low. It increased privacy and was less disturbing for the care taker's sleep. The discussions around the introduction of the technology placed an emphasis on the routines around granting nightly supervision by the assistance officers. This resulted in that just night supervision was granted, the decision if it should be physical or digital was taken together by the care giver and the caretaker.

Initially there were concerns that the use of the technology should lead to reduction in personnel. Another concern among the personnel was technical malfunction and how this could affect the workflow. During the pandemic information was sent out to all care takers that the supervision should be changed from physical to digital supervision. No one of the care takers questioned this since they thought it was important to avoid physical meetings during the pandemic. However, thoughts were raised about being monitored by a camera during sleep. These doubts were reduced when it became clear that the camera just was switched on during predefined time slots.

The introduction for the personnel consisted of that a new working routine was sent out, and the mobile app to be used by the care givers was described at a meeting. The participants felt that they had support in using the technology and that it was easy to ask each other when they encountered issues. The municipality had a service agreement with the company that supported the service team at the municipality.

Implications on Workflow

In general, the technology was described as well-working, but when the caretaker was not visible through the camera, a physical visit had to be made. The case was often that the caretaker was awake doing something else in another room. Complementary routines or further cameras in other rooms was suggested as a solution to this. However, the overall impression among the participants in the study was that the usage of cameras had made it possible to set off more time for visits that had to be physical. The employee that installed the cameras got an increased workload since this task was added to his/her existing tasks.

After some time, the usage of the digital night supervision went down by approximately 50 percent, and again it was easier for the caretaker to choose between physical and digital night supervision. No one could really explain how this had happened, it just went back to the way it had been previously.

In the interviews it was described in terms of a lack of actively keeping up new routines rather than a decision to go back to previous routines. Some explanations given by the interviewed participants were that the arguments related to the pandemic had become weaker and that the assistant officers had not been informed about that night supervision should be default regardless of the pandemic. For the care personnel, this again increased the working load regarding physical visits.

The actual supervision (looking at the caretaker through the camera) was conducted by the service provider (the company responsible for the equipment) and when a physical visit was needed, they contacted the night patrol. However, there were discussions about advantages with taking over this role. The argument was that interpretation of the situation could be made better by personnel that were familiar with the caretaker's nightly routines. The participants also had thoughts about advantages of using the technology for supervision during daytime. Finally, they mentioned that it during the usage of the technology had become easier to understand for whom the camera solution could be a good option.

Usage from the Perspective of the Personnel and the Older Adults

Starting to use the technology was described in a positive manner and the technology seemed to have worked well, but in some cases the assistant nurses working daytime had not understood how the technology operated. For example, the cameras had been moved, covered, switched off or wires had been plugged out.

The participants mentioned that there had been quite few complaints from caretakers or relatives but to some extent the caretakers had been worried about being monitored by a camera in their sleep. In some cases, the assistant nurses had not been able to explain how the technology worked since they did not have this knowledge themselves. As a solution to this, more written information to the assistant nurses was suggested. Even if information was provided to the caretaker by the assistance officer information needed to be given several times, and in a written version such as a simple brochure that could be given to the caretaker.

From the perspective of the relatives, the implementation of the digital night supervision contributed to a new way of perceiving technology. It went from being something that reduced the physical contact to something that could create new possibilities. However, most of them still thought that nightly supervisions should be physical since this was what they were used to.

General Thoughts and Insights

The importance of a larger focus on digital inclusion and user needs was mentioned, since most older adults do not want to be dependent, and many daily challenges could be addressed easily with different digital solutions. It was mentioned that many older adults both are interested and willing to learn, and that digital solutions could be introduced to older adults to a much greater extent. Further, it was suggested that the organizations should be brave and make decisions earlier and quicker. The implementation of the night supervision due to the pandemic became a good example of how this could be

achieved in a swift way. Finally, it was pointed out that the technology should work without problems, and that it needs to work alongside other technical equipment. The equipment (camera and device for connectivity) was also large and ugly and placed in the home environment without consideration about how it was perceived by the caretaker.

DIGIREHAB – AN APP FOR PHYSICAL EXERCISE

DigiRehab (<https://digirehab.dk/en/>) was a digital app for physical exercise. The aim was to support the user in maintaining physical functions. It consisted of possibilities to set up simple individual training programs and possibilities to conduct follow-ups. The app was used on a tablet brought by the assistant nurse. He or she showed the older adult videos of different exercises, and the older adult conducted the exercises supported by the assistant nurse. At the end of the session, there was an evaluation. Most often it was the assistant nurse that asked the older adult the questions and then filled in the questions for the older adult in the app. When the assistant nurse left, he/she took the tablet with him/her. Each assistant nurse was responsible for one or more older adults that participates in the program. In total around 20 assistant nurse and 15-20 older adults were involved using the training application.

Starting to use the Technology

Under a period, the municipality had discussed the fact that when an older adult receives his/her first support from the municipality the decline and the support from the municipality increases rapidly. There was also a discussion about to which extent this course of event was reinforced by the behavior of the assistant nurses that might provide too much support to the caretaker. The aim of using the app was to delay the point in time when an older adult rapidly becomes dependent.

Many older adults were enthusiastic to participate since the project had gained attention in the local media. Many assistant nurses were also interested in participating. The assistant nurses were selected by the unit managers, however not all that were interested were asked to participate. The concerns among the assistant nurses were related to further documentation and increased workload.

A one-day introduction was held by the company and the assistant nurses supported each other in the usage. The company that had developed the app was also available for support and for making changes in the app. The exchange was mutual, and the company used this project as a pilot project to gain feed-back and improve the application. In the interviews, preparation and planning were also described as important. On some occasions there were no tablets to use after introduction to the personnel.

Implications on Workflow

Time for conducting the exercises with the older adults was scheduled outside the ordinary tasks and these visits were dedicated to participation in the training program. The assistant nurses perceived it as a part of their work

and not as something that further has been added. When starting to use the service, it was realized that there was a need for scheduling time before and after usage as well, both for practical and social reasons.

During the project the assistant nurses became more secure and there were less questions. During the project it was also realized that they needed to follow-up if the older adults wanted to remain in the program. This to avoid pressuring someone that did not want to participate anymore. Further, there was a wish to be able to plan more individual training programs together with a physiotherapist. The arrangement around the usage of the app was also suggested to be more flexible with a group (instead of a specific assistant nurse) responsible for each participant. Since there was a need for some knowledge in physiology, this group should also consist of a physiotherapist and several assistant nurses to reduce the dependence on the availability of a specific person.

Usage from the Perspective of the Personnel and the Older Adults

The usage was described as engaging but also demanding since the assistant nurse had to take initiatives, be innovative and support the older adult in conducting the exercises. The training session was also described as providing added value in terms of social interaction. Planning and scheduling were described as important. Engaged participants in the training program became disappointed when a session had to be canceled due to lack of personnel.

Many of the older adults were interested and engaged, but interest varied and some of the participants opted out. However, the older adults that have continued with the program were excited over their improvements and their possibilities to become more independent. Selection of older adults to participate was also discussed since the municipality wanted to reach older adults before they had become too dependent.

The app was described as a bit difficult to use in the interaction with the older adults. Each exercise should be evaluated after being conducted, which at least by some of the assistant nurses, were described as complicated. Instead, this was done by paper and pen and then added to the app afterwards.

The collaboration with the company was appreciated and mutual. The company got feedback on their product and the municipality received quick adjustments and changes in the app. The statistics the municipality gained from the company was used for improving both the training program and the ways of working.

General Thoughts and Insights

During the interviews it was mentioned that there probably exists many stereotypes related to both older adults' and care personnel's knowledge about technology. It was said that these groups are likely to be more technology savvy than expected, and it is important to believe in their willingness and in their skills. Many opportunities to invoke interest are also foreseen. The municipality already used other digital services, for example purchasing groceries online together with the older adults. These experiences could make it

easier to bring a tablet to the older adult and to create an interest in using other digital services as well.

Further, it was mentioned that the largest challenge was not to introduce and implement new technology, it is to start to work in new ways without sticking to old parallel versions. New processes and workflows need to be well defined and followed-up.

DISCUSSION AND CONCLUSION

The digital solutions that were described in this paper were different in that sense that the usage of one of them (supervision by camera) actively did not involve the older adults but the other one (rehab app) did. However, both contexts needed changes in workflow for the care givers and involvement and knowledge about the technology among the care takers or the older adults

Digital Night Supervision

The introduction of the night supervision by camera went smoothly, both since the value of physical visits during the night was low and due to the pandemic. However, after some time the usage went down showing the importance of continually follow-up to reduce the risk of slipping back to how things were done previously.

When the municipality had started to use the digital supervision, the care personnel started to discuss how the service could be improved. This, in terms of taking over the supervision from the service provider since they were more familiar with the caretaker's nightly routines. The participants also discussed possibilities of using the camera for supervision during daytime. These parts from the interviews are in line with Sjölinder et al. (2015), where the care personnel starting to take own initiatives when gaining a feeling of control over the technology.

There was a need for more written information to the assistant nurses about how the digital night supervision worked. The assistant nurses need to be skilled enough to be able to convey information both about how the technology works and about its benefits. A larger emphasis should be placed in getting the assistant nurses and the older adults to understand what the technology is about. They should also get written information to return to when there are uncertainties or when there are new assistant nurses that are not familiar with the technology. The assistant nurses are ambassadors for the technology, and they need to feel that they are skilled and in control. This could also increase the older adults' understanding of the technology since it will become easier for the assistant nurses to provide a supportive context for learning (Broady et al., 2010).

The equipment (camera and device for connectivity) was large and ugly and placed in the home environment without consideration about how this was perceived by the caretakers. Aesthetics with respect to the equipment should be given a much stronger attention since this is closely related to how the older adult perceives the technology, and even more important how he/she perceives his/her own identity, self-images and feeling of being in control in a situation where it is no longer possible to be independent.

Rehab Application for Physical Exercise

The implementation of the rehab app pointed out the importance of how participants are selected. Initially, participants were selected instead of having the possibility to sign up. A more inclusive approach might increase engagement, and the personnel that are the most interested ones could be engaged as superusers to provide support and spread further enthusiasm (Mannheim et al., 2019). A further aspect regarding keeping up the engagement turned out to be the planning. On some occasions there were no tablets to use after introduction to the personnel. The enthusiasm to get started could decline and therefore it is important to have everything prepared to make use of the energy among the involved actors.

With respect to workflow time for conducting the exercises with the older adults was scheduled outside the ordinary tasks with dedicated visits for the training program. The organization round the usage was flexible and the scheduling was changed when it was realized that there was a need for scheduling time before and after usage as well.

Stereotypes related to both older adults' and care personnel's knowledge about technology was brought up and it was pointed out that it is important to believe in their willingness to use technology and in their skills to do so. There are many opportunities to invoke interest by bringing a tablet and create curiosity, and when the technology is used together it also provides added value in terms of social interaction which could have further positive effects (McCarney et al., 2007).

ACKNOWLEDGMENT

The authors would like to thank the participants in the study for their time and valuable input to the work.

REFERENCES

- Broady T., Chan A., Caputi P. (2010). Comparison of older and younger adults' attitudes towards and abilities with computers: implications for training and learning. *Br J Edu Technol* 41(3): 473–485
- Lagacé, M., Charmarkeh, H., Laplante, J., Tanguay, A. (2015). How Ageism Contributes to the Second-Level Digital Divide: The Case of Canadian Seniors. *Journal of Technologies and Human Usability*, vol 11, no 4
- Lagacé, M., Charmarkeh, H., Zaky, R., Firzly, N. (2016). From psychological to digital disengagement: exploring the link between ageism and the 'grey digital divide'. *Journal of Communication and Public Relations* vol. 18, no 1(37), 65–75
- Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S.C., McDonnell-Naughton, M., Wouters, E.J.M, van Zaalén, Y. (2019). Inclusion of Older Adults in the Research and Design of Digital Technology. *Int. J. Environ. Res. Public Health*. 16(19): 3718; doi: 10.3390/ijerph16193718
- McCarney R, Warner J, Iliffe S, van Haselen R, Griffin M, Fisher P. (2007). The Hawthorne Effect: a randomised, controlled trial. *BMC Med Res Methodol*. 7: 30. doi: 10.1186/1471-2288-7-30. PMC 1936999. PMID 17608932.
- McDonough C.C. (2016). The Effect of Ageism on the Digital Divide Among Older Adults. *J Gerontol Geriatr Med* 2: 008. DOI:10.24966/GGM-8662/100008

-
- Sjölinder M, Scandurra I. (2015). Effects of Using Care Professionals in the Development of Social Technology for Elderly. In Human Aspects of IT for the Aged Population. Design for Everyday Life. LNCS Vol 9194, pp 181-192, 2015 First International Conference, ITAP 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015.
- Sjölinder, M., Mårtensson, A. (2021). Human Stereotypes Affecting Behavior when Implementing Technology Targeted Towards Older Adults. AHFE 2021: International Conference on Applied Human Factors and Ergonomics, New York, United States, July 25-29, 2021