

Lohja Hospital

Topic: Digitalisation |

Case summary

Lohja hospital is part of the Helsinki University Hospital (HUS) network, which employs 730 healthcare professionals. A new neurological rehabilitation ward was established in March 2018 and virtual reality (VR) headgear for rehabilitation was deployed in April 2018, making Lohja's ward one of the first adopters of VR for rehabilitation in Finland. The introduction of VR headgear allows health care professionals working in rehabilitation to manage their work and workload more efficiently. Therapists are able to deploy the VR either to work with multiple groups of patients at the same time, or with certain patients as a way to free up time and expertise to concentrate therapeutic support for those who cannot benefit from VR due to their specific needs.

About

Case study name: Digitisation in the workplace (/case-study-names/digitisation-in-the-workplace)

The introduction of VR has not been without its complications. Some of the initial resistance to the more regular use of the VR headgear for rehabilitation was due to technical glitches and limited web connectivity. In addition, as nurses were not among the recipients of the initial training, some of them experienced 'digital stress' when required to assist patients using the VR headset. This was largely due to lack of familiarity with the VR technology. This problem was overcome through informal exchange of knowledge between therapists and nurses, which was facilitated by the head nurse who often pairs interested nurses with therapists working with VR, rather than through formal training. This has the positive benefit of creating a tighter sense of community within the ward. Over time, the VR technology has been met with enthusiasm by the medical staff, including the nurses who view it as an exciting new technology that adds more variety to their work and benefits patients.

Establishment profile

Lohja hospital is part of HUS, which is the largest university hospital operating in the Hospital District of Helsinki and Uusimaa. The Hospital District of Helsinki and Uusimaa itself is further divided into hospital areas: the HUS area; Hyvinkää Hospital area, Lohja Hospital area, Länsi-Uusimaa Hospital area and Porvoo hospital area. Each hospital area has its own board that is responsible for establishing the strategy for the hospital area and also manages the finances for the hospitals within the area.

In Lohja Hospital the new neurological rehabilitation ward employs 26 medical staff of whom 16 are nurses and 10 are occupational therapists (the primary users of the VR headgear). Around 75% of those employed in this ward have permanent contracts, and the majority of employees (80%) are women. The average age of the medical staff is 44 years of age. The workforce is hierarchically stratified: doctors/therapists are in charge while nurses perform tasks to support the medical specialists.

The ward provides outpatient rehabilitation (meaning the patients are not required to be hospitalised to receive rehabilitation treatment) for adults (16 years of age and older) with sudden brain damage. The patients mainly have cerebrovascular disorders or brain injuries and have been suffering with their illness for less than a year. The neurological rehabilitation ward offers neuropsychological rehabilitation as well as physical, speech and occupational therapy.

The relevant trade union in Lohja Hospital is Tehy, whose members are health care professionals and social workers. Trade union membership is typically high in the health and social care sector in Finland with as many as 90% of employees being members.

Technologies adopted and embeddedness in the workplace

In 2018, VR headgear was introduced at the new neurological rehabilitation ward at Lohja Hospital. At that time, five other hospitals that are part of HUS network were introducing VR and the ward management at Lohja Hospital wanted to be among the first.

The VR headgear, developed by an external provider, makes it possible for therapists to modify the VR environment towards specific and tailored rehabilitation exercises for the patients. The approach taken to rehabilitation is tailored to each patient's individual needs. Therefore, the VR headset is deployed only when a therapist has a clear understanding of whether or not it will be beneficial to a patient within their rehabilitation plan. The VR headgear is one tool of many – most being more conventional rehabilitation tools – available for therapists to use as they see fit. By integrating the VR headset into the neurological rehabilitation tools available at the hospital, therapists are able to provide a larger selection of exercises to patients. When using the VR headset, patients are guided through the rehabilitation activities planned beforehand by their therapist. Nurses oversee the process and support the patients as required during the sessions. The VR application presents opportunities for work efficiency by facilitating the treatment of multiple patients at the same time and allowing more informed decisions to be made about specific patient rehabilitation procedures. The long-term goal would be to create a rehabilitation service that allows patients to take a VR headset home and work on rehabilitation exercises outside the hospital setting, which would significantly decrease the time that staff spend interacting with patients.

While all 10 therapists at the ward have access to the VR headgear, its actual usage is more limited. Only three to four therapists use the VR headgear on a regular basis and as part of their daily practice. Such therapists use it for up to one hour daily and with up to a maximum of 10% of their patients.

Two years after the introduction of the technology, the therapists and nurses are interested in continuing using the technology in their daily work. This is in spite of technical glitches experienced during the technology deployment. Some of these issues are linked to Wi-Fi connectivity which, in the event of lost connection, stops the use of the VR headset. This makes patients miss out on planned activities, which discourages the therapists from using the VR technology.

Drivers to technology adoption

The main motivation behind the introduction of the VR headset was to increase the efficiency of the neurological rehabilitation process. Neurological rehabilitation is characteristically a one-to-one process where a therapist works with the patient through rehabilitation activities. It is a time-consuming process as the therapist can only give attention to one patient per time. In addition, it is a process based on repetitions performed by the patients. Repetitions of specific physical actions are meant to continuously stimulate the patient. These activities normally require a medical professional (therapist or nurse) to oversee the patient. In the future, more efficiencies could be introduced if patients were allowed to take the VR headset back home (the neurological rehabilitation ward is for outpatient rehabilitation) and continue their therapy.

Coupled with the promise of offering efficiency benefits, the technology adoption was also motivated by the need to stay at the forefront of new technological developments. The opening of the new rehabilitation ward was considered the right time to invest in new technologies. The adoption of the VR technology is regarded as part of an inevitable pathway towards other more complex med-tech solutions in the future.

Strategy to technology adoption

The deployment of VR in the neurological rehabilitation ward is neither part of a wider institutional strategy, nor is it part of a department level strategy. The VR headgear was acquired as an 'off the shelf' product, from a Finnish company which provides technical maintenance and software updates.

While the VR headgear was piloted at another HUS hospital prior to its deployment at Lohja, these developments were not part of concerted efforts.

The ward was allocated funding for technologies and digital equipment from the Lohja Hospital area board which allocates funding to the activities of hospitals operating within the respective hospital area. The deployment of the technology was not funded through any additional external sources.

The roll-out of the technology at the ward was rather ad hoc with an underestimation of the number of technical issues still to be tackled and an underestimation of the training needs of medical staff, especially nurses.

The technology provider provided the initial training to therapists on the use of the VR headset, after which the new tool for rehabilitation was at the disposal of therapists to integrate into their patient plans. At that time, this training was deemed sufficient for the technology to be deployed. In hindsight, nurses should have also received training on VR headgear use. The solution was found in more informal exchange between therapists who acted as 'champions' of the new technology and nurses who were interested in learning about the novel technology. These champions also motivated other medical staff to engage with the VR headset and continue using it in spite of some technical glitches.

In terms of future plans, the ward management foresees a co-creation model with different VR headgear providers, whereby technology providers and the ward's therapists and nurses as users, work together in developing the technology and tackling glitches. There is no defined strategy as to how training is to take place, although the co-creation model hardly allows for formal training, as new solutions are being constantly created – a continuation of the informal exchanges is most likely.

Impact of the technologies in the workplace

Business model

The introduction of the VR headset has changed the business model as the technology is used by the therapist when they deem it necessary and beneficial for the patients. The ward is however reliant on the technology provider for the use of the technology by medical staff. Management is reportedly in talks with other VR headgear developers to expand the types of exercises and treatments that can be offered through VR. The ideal situation would be to have one manufacturer for VR headgear but many software providers to expand the 'library' of VR exercises which would not require any additional hardware. The current situation is that new VR software is connected to new VR hardware. If other hardware were introduced, it would negatively impact the working environment as different VR headset by different manufacturers would start taking up space.

The long-term goal is to create a rehabilitation service which would allow for patients to use VR headgear to work on rehabilitation exercises outside of a hospital environment, however, such plans are still in progress.

The management is also considering shifting away from the prevailing business model of the ward as a consumer of off-the-shelf solutions and moving towards a co-creation model whereby the ward would take part in the development of technology solutions, together with other technology providers.

Work organisation

The use of VR technology primarily depends on whether the occupational therapist decides to include it in the patient programme. However, unlike other neurological rehabilitation practices which can be scheduled for, as they involve physical exercises, the use of VR has encountered challenges in the form of software crashes or trouble with WiFi connectivity. This translates into workflow disruptions as scheduling for VR usage is less reliable.

When the VR headgear does work as intended it allows for more efficient time use by occupational therapists as they can work with several patients at the same time; either supervising several patients performing rehabilitation exercises with VR, or scheduling use of VR for some patients (who are then supervised by nurses) while the therapists work more extensively with patients with more complex needs.

The VR headgear has not affected the composition of the workforce at the rehabilitation ward. It has, however, created new informal exchange and closer cooperation between different staff members (nurses and therapists). It has also meant that nurses skilled in the use of VR headgear would be more at liberty to support patients. Conversely, therapists were able to leave the task of actually performing the therapy they had designed for their patients to the nurses.

Job quality

Physical environment

The introduction of the VR headgear did not bring any significant changes to the physical work environment at the rehabilitation ward, nor influenced the ergonomics. This is largely due to the fact that occupational therapists use the VR headgear as a medical tool, but do not interact with the VR - this is done by the patient. The concerns of ambience, posture, etc. are more related to the patient experience rather than that of the occupational therapists or nurses. In terms of how patients react to VR, they consult with the occupational therapists on their use and patients can opt out from utilising VR.

Social environment

The impact of the technology on the social environment at the rehabilitation ward in many respects stems from the technical issues experienced when using the VR headgear (for example software crashes, limited WiFi connectivity) and the way employees have dealt with such issues. The frequency of technical glitches tended to discourage medical staff from using the technology. The chief physician and other therapists acted as 'champions' of the new technology, motivating other medical staff to engage with the VR headset and solving the technical issues.

The novelty of VR technology in therapeutic practice can result in greater wellbeing and satisfaction for both employee and patient. It was described in some interviews as a 'candy' adding novelty and variety to the rehabilitation activities. Working with VR was even mentioned as a bonus to the working experience. When the VR technology works as intended and it achieves the expected impact on patient rehabilitation progress, the medical staff feel more motivated and engaged in their daily work.

The nurses in the rehabilitation ward showed a considerable interest in working with the VR technology because reportedly it adds novelty to their work. The nurse's satisfaction with the use of the VR headgear comes from seeing the progress made by patients in terms of healing process.

The informal exchange of knowledge between therapists and nurses contributed to a tighter sense of community within the ward, as they try to help each other in the use of VR and teach the necessary skills to operate the VR (for example, how the software functions, how to navigate and operate the VR software, etc.).

Working time quality and work intensity

In the phase of technology deployment, the use of the VR headgear at the neurological rehabilitation ward led to a degree of 'digital stress' particularly among nurses who did not receive any prior training and had infrequent interaction with the VR technology. Nurses worried about having to learn on the job and develop new IT-related skills. The stress and uneasiness with the technology diminished over time as familiarity and IT skills improved with more frequent use and through informal knowledge transfer between medical staff, with therapists teaching nurses how to operate the VR headgear. These informal exchanges were facilitated by the head nurse who paired nurses keen on using the VR with therapists that had scheduled use of VR with patients.

The use of the VR technology did not create additional job demands or increase the number of tasks to be performed. VR technology does not use data gathering software and the evaluation of the patient progress is still based on occupational therapists and nurses assessing the patient progress through medical tests.

Because the use of VR is optional, this has led to different degrees of exposure to the technology among medical staff, with nurses having less overall experience. Those who interact with VR less often end up requiring more frequent reminders on how the VR headset works.

By making it possible to increase the opportunities to help patients through the capacity to treat multiple people at once, the VR headset has contributed towards some improvements in resource and time efficiency in the ward. These are partially offset by the additional technical issues, however, this did not lead to changes in working time as there are always other tasks to perform.

Skills and discretion

The primary recipients of the initial training courses were the occupational therapists. The nurses expressed disappointment towards not receiving any training, which should have been made available to a wider group of employees. While therapists are the primary users of the VR headset, as they are expected to interact with it on a more technical level, nurses are equally expected to assist in rehabilitation exercises involving VR in terms of helping patients who use VR equipment. For instance, nurses are responsible for helping patients put on and remove the VR headgear as well as provide technical assistance during the exercises if the patients require help.

While the therapists already have a relatively high level of discretion in their work, the nurses would enjoy using the VR headgear more in their activities. This would not necessarily enhance their job discretion but allow them to use a wider range of advanced rehabilitation tools and add variety to their job.

Once the technology was deployed, the head nurse identified nurses at the ward who were interested in learning to use the VR headset and paired them with the therapists who use the technology for patient care.

Prospects and earnings

While therapists and, at a later stage, nurses were required to learn how to use new medical equipment, it did not result in changes to their employment profile or affect their remuneration. The remuneration practices are governed by law and are not impacted by the use of the technology. Prospects are also very much regulated as the staff (both nurses and therapists) progress through their career. The most apparent benefit to employees is the ability to enrich their work activities by learning new tools. Furthermore, the deployment of VR in the neurological rehabilitation ward did not result in unemployment and the management was sceptical that this technology would ever replace employees. This opinion was supported by the employees themselves, as none of the interviewees felt their job was at risk, or otherwise threatened, by the introduction of the VR technology.

Employee involvement

While all employees in the ward were informed about the introduction of the technology, the VR headgear was deployed without employee consultation. The decision was solely in the hand of the management of the rehabilitation ward, who had a vision to be cutting-edge in relation to approaches to neurological rehabilitation. The approach taken was to make the new technology available to staff as part of their toolkit, and to encourage its uptake on-the-job, putting in place communication channels, knowledge sharing and nominating 'champions' of the new technology, who motivate other medical staff to engage with the VR headset.

The trade union representative had no influence on decisions related to the adoption of the new rehabilitation technology. The introduction of technology was not regarded as a source of concern for the trade union representative. From a trade union perspective, areas of greater interest concern collective agreements, legal aid to workers, and occupational health and safety.

Commentary

One lesson learned was that instead of buying a technology off the shelf, it would have been better to engage with hardware and software developers in a co-creation mode, in which the ward is more actively involved in the development of the VR rehabilitation solutions. This would have also reduced the reliance on a single technology provider. The ward is now considering moving toward a co-creation model.

The expansion and larger integration of VR technology into the digital infrastructure of the hospital could bring further added value. Combining VR with other technologies (for example with Internet of Things (IoT) to add patient monitoring and data gathering functionalities which are currently missing)

would bring about larger impacts on how work is organised. However, such developments would require that several new challenges be addressed (for example data protection, the potential of new employment profiles for work with digital technologies and/or digital data).

Information sources

Interviews were conducted between May and June 2020 at Lohja hospital with the chief physician at the neurological rehabilitation ward (in the capacity of innovation director), an occupational therapist and a nurse, the head nurse (in an HR management position) and a trade union representative.

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 **Revision log summary**