Assistive Technology

The Official Journal of RESNA

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/uaty20

The impact of a crisis on the provision of assistive technology in Sweden: the case of COVID-19

K. Baudin, S. Frennert, C. Pettersson & Å. Larsson Ranada

To cite this article: K. Baudin, S. Frennert, C. Pettersson & Å. Larsson Ranada (07 Oct 2024): The impact of a crisis on the provision of assistive technology in Sweden: the case of COVID-19, Assistive Technology, DOI: 10.1080/10400435.2024.2411578

To link to this article: https://doi.org/10.1080/10400435.2024.2411578

ASSISTIVE TECHNOLOGY
https://doi.org/10.1080/10400435.2024.2411578

Taylor & Francis
Taylor & Francis Group

The impact of a crisis on the provision of assistive technology in Sweden: the case of COVID-19

K. Baudin, PhD [a], S. Frennert, PhD [b], C. Pettersson, PhD [c], and Å. Larsson Ranada, PhD [a]

[a]Unit of Occupational Therapy, Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden; [b]Department of Design Sciences, Lund University, Lund, Sweden; [c]Department of Health Sciences, Kristianstad University, Kristianstad, Sweden

ABSTRACT

The entitlement to access assistive technology (AT) is fundamental for all individuals. However, challenges encountered during societal crises can significantly impact opportunities for participation and engagement among AT users. Understanding the implications of crises and disasters on AT provision along with their repercussions for end users is crucial. This research endeavors to investigate the experiences of managers overseeing AT provision during crises, using the first wave of the COVID-19 pandemic as a case study. An open-ended questionnaire was distributed to health care managers ($n = 18$) within AT organizations in Sweden. The responses were analyzed using qualitative content analysis, and four categories derived: *Embracing change and navigating new realities, Optimizing strategies due to decreased and limiting prescriptions, Unlocking access and addressing challenges in AT provision, The impact on the staff and their well-being vs effectiveness in the AT organization*. The findings indicate that AT organizations have demonstrated remarkable resilience and adaptability in the face of reduced consultations and growing care burden. Despite these challenges, managers have gained valuable insights into developing AT provision more efficiently and sustainably, particularly in digitization. The lessons learned will be critical in ensuring AT provision remains responsive to the needs of patients and society in the future.

ARTICLE HISTORY
Accepted 25 September 2024

KEYWORDS
assistive technology; decision-making; health service delivery; management; resilience

Background

The right to access assistive technology (AT) is enshrined as a fundamental human right under the article 32 of the convention on the rights of persons with disabilities (Convention of Rights for People with Disability [CRPD], 2016) with the overarching goal of facilitating individuals´ participation in society and enhancing their daily lives. The CRPD articulates a core principle of "full and effective participation and inclusion in society" (art. 3C, CRPD, 2016), emphasizing the importance of creating an inclusive environment for all individuals. The concept of AT encompasses a wide range of technologies, including universally designed everyday products, mainstream devices, remote technologies, monitoring and sensing devices, as well as various information and telecommunication technologies, as highlighted by the World Health Organization and the United Nations (WHO, 2022). AT provision involves the comprehensive process of ensuring that individuals with disabilities who could benefit from AT receive the most suitable technology solutions tailored to their specific needs (de Witte et al., 2018). Central to this process is the effective delivery of services, as emphasized in previous research by Blomquist and Jacobsson (2011) and Dahlberg et al. (2014). In Sweden, AT provision is an integral part of the country's welfare system and healthcare organization, which are characterized by public funding, universal access and a needs-based approach for all citizens, as outlined by the National Board of Health and Welfare (NBHW, 2022). The well-established AT centers across Sweden provide information, consultations, maintenance and repairs of AT, offering support to prescribers, AT users and their families. AT is recognized as a vital element of healthcare and is financed, distributed and prescribed through the national health system, ensuring equitable access for all individuals (NBHW, 2022). The Swedish approach to AT provision is underpinned by a policy framework that emphasizes integration, full participation and equality, as articulated by the Ministry of Health and Social Affairs (2022). This guiding policy has shaped the development of Sweden´s AT provision systems, as evidenced in the works of Sund et al. (2013) and Larsson Ranada and Lidström (2017), highlighting Sweden's commitment to fostering an inclusive and accessible environment for individuals requiring AT.

The emergence of the COVID-19 pandemic in early 2020 marked an unprecedented global health and social crisis, as acknowledged by the WHO (2020). The multifaceted repercussions of the pandemic and the ensuing efforts to mitigate the spread of the coronavirus have had far-reaching economic, social, mental and physical impacts on individuals and communities worldwide. A wealth of literature has highlighted the concerning rise in health inequalities and heightened risks faced by vulnerable groups, particularly those with disabilities or chronic conditions, during challenging period (Layton et al., 2021; Lazarus & Oluwole, 2020; Pettinicchio et al., 2021; Qi &

CONTACT K. Baudin katarina.baudin@ki.se Unit of Occupational Therapy, Department of Health, Medicine and Caring Sciences, Linköping University, SE-601 74 Norrköping, Linköping, Sweden.

Hu, 2020; Rizzo & Beheshti, 2021; Shakespeare et al., 2021; Siette et al., 2021; Smith et al., 2021, 2022).

In contrast to its Nordic counterparts such as Denmark, Finland and Norway, Sweden experienced a threefold higher infection rate during the initial wave of the COVID-19 pandemic, despite similar rates of municipal infection (Ludvigsson, 2020). By the close of 2020, Sweden had recorded approximately 7,000 COVID-19 related fatalities, with nearly 90% of the deaths occurring among elderly individuals, half of whom were residents in long-term care facilities (SOU, 2020). In response to the imperative of protecting the health of vulnerable older adults, especially those residing in frailty within long-term care settings, stringent measures were quickly implemented. These measures included a comprehensive prohibition on visitations to long-term care facilities from March 2020 onwards, with the aim of containing the spread of the virus among residents (Hanna et al., 2022). The effectiveness of these restrictive measures in decreasing the viral transmission and their implications for ensuring quality care provision warrant thorough investigation throughout the pandemic, a noticeable neglect of the perspective of management within healthcare service delivery organizations (i.e. registered nurses and certified care nurses) who bear ultimate responsibility for the wellbeing of older individuals became apparent (Rasmussen et al., 2022; Rauhala et al., 2022). The invaluable insights and experiences of these stakeholders in navigating the challenges posed by the crisis and upholding the standards of health service delivery for vulnerable populations merit closer examination and consideration in the broader discourse on pandemic response and healthcare delivery. The crisis of the COVID-19 pandemic also affected AT provision, especially as the largest group of AT users, older people, was also one of the groups that suffered the most from the pandemic and its consequences. Considering the pivotal significance of AT, it is critical to comprehend the effects of a crises on their utilization and accessibility, as well as the potential of these technologies in crisis and pandemic-related challenges. Amidst barriers and crises, the responsibilities of managers become pivotal in overseeing business operations to ensure the uninterrupted delivery of services. It is crucial for these managers to have a profound understanding of the diverse impacts experienced across different settings and contexts. Such insight can lead to the development of strategies that strengthen services and systems, enabling them to navigate effectively through the complexities of a global health emergency. Understanding how a crisis affects the organization is essential for enhancing resilience and ensuring equitable provision of AT services in the future.

Thus, this study aimed to explore the impact of a crisis, using the COVID-19 pandemic as a case study, on AT provision from the perspective of managers in healthcare organizations.

Methods

This is an exploratory study (Polit & Beck, 2012) adopting the qualitative research method content analysis according to Graneheim et al. (2017). To address the study's aim, a questionnaire with open-end questions was developed and sent to healthcare managers in AT organizations in Sweden. The Standards for Reporting Qualitative Research (SRQR) (O'Brien et al., 2014) were consulted during the preparation of this manuscript.

Participants

The selection of participants was based on stratified purposive sampling (Polit & Beck, 2014), in which the The Swedish Association of Local Authorities and Regions (SALAR´s) National Network of Assistive Technology Managers recommended managers from regions in Sweden for the study. The network consists of all the managers and decision-makers responsible for the economy at AT organizations. The inclusion criterion for participation was managers responsible for/involved in decisions when purchase or procurement of new ATs is considered to big volume assortment in their respective AT organizations. Potential participants ($N = 30$) were contacted by an e-mail in which the study was described, and a request was made for them to participate. They were provided written information about the study, including confidentiality, the purpose of the study, their right to decline or withdraw at any time, and how the data would be handled. This information was given to all participants before the survey was sent out. The questionnaire was web-based, along with a reminder and was distributed 4 weeks after the initial e-mail.

Data collection

Due to the COVID-19 pandemic and the managers´ workload, interviews were not possible to perform and a questionnaire with open-ended questions was used for data collection. The questionnaire was designed specifically for this study, as no previous questionnaire was deemed suitable, and it was created following the process described by Charlton (2000). The topic areas were based on earlier experiences and knowledge by the authors (i.e. Baudin et al., 2020, 2021; Larsson Ranada & Lidström, 2017; Pettersson et al., 2022) to cover the ecosystem of AT provision, and were discussed among the author group until a consensus was reached. The questionnaire covered the following areas: 1) challenges with prescriptions, 2) challenges with consultations, 3) experiences with distributions, 4) patients' challenges with the use of AT, 5) learning and experiences from the pandemic start during spring 2020, 6) adaption of work, 7) changed work situation, 8) the aspect of digital technology and AT for patients, 9) patients' changed behavior due to Covid-19, and 10) how patients changed behavior influenced the participants' work. The self-administered online questionnaire was distributed in October–December 2020, with one reminder sent after 4 weeks to managers. If the participants chose to answer the questionnaire, informed consent to participate in the study was presumed.

Data analysis

The data were analyzed using qualitative content analysis (Graneheim & Lundman, 2004; Graneheim et al., 2017). The data from the web-based questionnaire were

downloaded and imported into a Microsoft Excel© spreadsheet used for organizing the extracted data. Following the steps in the method, the whole data set, that is, all participants' answers, were read several times by the authors. The dataset as a whole was considered the unit of analysis. Next, the text was divided into meaning units: words, sentences, or paragraphs that, through their context and content, were related to each other (Graneheim & Lundman, 2004). These meaning units were condensed and labeled with a code. A code is a shorter sentence or a single word shortening the meaning unit but keeping the principal content of it. This coding was performed by two of the authors, followed by discussions to reach consensus in the coding. The codes and condensed meaning units were then utilized in forming categories based on similar content. The categories were presented and discussed among all authors until consensus, and four categories were formulated. This process of analyzing the data was not linear but more of an iterative process where the focus switched between the whole and the parts of the data during the analysis to understand the different statements in relation to the categories emanating from the data. The analysis was performed on the original answers from the questionnaire in Swedish, and exemplifying citations presented in the findings was translated after the analysis. Due to differences in syntax, expressions and word order, translation is not an easy process (Nikander, 2008), and to match the Swedish content and citations to English translations, the intention was to bring forward the narratives in the answers not the exact wording.

To ensure the trustworthiness of the analytic process, the authors' preunderstanding was as transparent as possible in terms of their relationship to the field of knowledge produced by the voices of others. Coming from different experiences and professional backgrounds (cognitive science and occupational therapy), such as experience with the target group and qualitative research methods, an awareness of the importance of having an open mind when analyzing empirically generated data was maintained during the whole process (Backman & Kyngäs, 1999).

Research ethics

This study did not include any personal or sensitive information that required ethical approval under the standards of the Swedish Research Council. However, the Helsinki Declaration (World Medical Association, 2013) regarding ethical principles for research involving human subjects and the guidelines for research ethics issued by the Swedish Research Council were followed. Informed consent to participate was obtained from all participants, as described earlier.

Findings

In total, 18 managers completed the questionnaire, and the analysis revealed four categories describing the impact of COVID-19 on the provision of ATs from the managers' perspectives. The participants' backgrounds are presented in Table 1.

The categories identified were: *Embracing change and navigating new realities, Optimizing strategies due to decreased and limiting prescriptions, Unlocking access and addressing challenges in AT provision, The impact on the staff and their well-being vs effectiveness in the AT organization*. The key findings for each category are presented in Table 2.

Embracing change of work and navigating new realities

The participants reported that their work the AT center had changed in many ways during the COVID-19 pandemic. First, there was a focus on hygiene and protective equipment. The participants underwent education on basic hygiene and measures to decrease the spread of infection, and there was a higher demand for surface disinfection than before the pandemic. In some cases, it was hard to follow the hygiene guidelines and to make visits safe, both at the customer's location and for those coming to the AT center. Before a consultation or prescription, more careful management of protective equipment was necessary, as was the need to ensure that those involved did not have any symptoms of Covid-19. Also, customers were more careful before visits. Travel was avoided to a higher degree, even though repairs onsite increased. Much of work was carried out at a distance; if

Table 1. Participants' backgrounds.

Gender	Years of age	Educational background	Years of experience as a manager	Small/big city/municipality
Male $n = 6$ (66.7%)	26–25 = 0 %	Postsecondary education (less than 3 years) 11.1% ($n = 2$)	0–5 = 44.4% ($n = 8$)	Big city/municipality (more than 50´ citizens) 61.1% ($n = 11$)
Female $n = 12$ (38.9%)	36–45 = 22.2%	Postsecondary education (longer than 3 years) 77.8% ($n = 14$)	6–10 = 33.3% ($n = 6$)	Big city (more than 200´citizens) 33.3% ($n = 6$)
	46-55 = 22,2%	Other education (e.g., management course) 11.1% ($n = 2$)	11–15 = 11.1% ($n = 2$)	Smaller cities/municipalities (less than 40 ´citizens) 5.6% ($n = 1$)
	56–65 = 55.6%		16–20 = 5.6% ($n = 1$)	
			>26 = 5.6% ($n = 1$)	

Note: at least $n = 2$ participants commented that they work cross-regionally

Table 2. Categories and key findings.

Categories	Key findings
Embracing change of work and navigating new realities	Focus on hygiene, protective equipment and more remote work
Optimizing strategies due to decreased and limiting prescriptions	Fewer prescriptions and more digital solutions
Unlocking access and addressing challenges in AT provision	Problems with deliveries from abroad, pick-up and delivery at other places
The impact on the staff and their well-being vs effectiveness in the AT organization.	High sick leave and working at a distance

possible, more staff worked from home, and meetings with customers and coworkers were digitalized to a higher degree.

> We have developed and participated in digital meetings with the patients, which we haven't done before. This has been a huge change in our way of working. If the technology had not been there, we would not have been able to enable this. (Manager 3)

Digital tools, contacts and communication methods such as ZOOM or TEAMS encounters with the patients increased. However, the managers reflected that detailed information regarding digital AT, for example applications, should have been better introduced by the staff. The participants noted that unclear information and guidelines were recurring during the pandemic.

Optimizing strategies due to decreased and limiting prescriptions

According to the participants, the number of prescriptions for AT decreased, as did consultations, testing, service and equipment repairs. Both cancelations of meetings and pending prescriptions caused this decrease, as only necessary prescriptions and repairs have been carried out.

> The patients have canceled a lot of appointments. And there has been a huge load of phone calls concerning protecting clothes, companies among other things … from both relatives, staff, and the prescribers … (Manager 17)

When possible, digital prescriptions and follow-ups were made. More prescriptions were carried out without a physical meeting, and some were made in out of the ordinary places, such as outdoors. There were also fewer participants at the consultations, limiting the number of persons involved. The repair needs of AT were prioritized. The participants raised concerns regarding this, as many unmet needs might affect patient safety. The care debt and staggering care remain a risk that the worst-affected customers will get worse and that their physique will suffer. Thus, any pent-up needed to be monitored by the AT center.

> In April/May, a great many 70+ and chronically ill older people disappeared … I mean, those in great need of both assistive technology and health care services, and that care debt that has now been created. we need to consider and be able to meet these. Some of these patients have started returning, but … with the new increasing spread of the virus, I don't know how it will turn out … (Manager 11)

Unlocking access and addressing challenges in at provision

The participants indicated that delivery was challenging because not all ATs were manufactured in Sweden. The borders between certain countries were closed, and products were stuck, for example, in Asia. To some degree, this issue was addressed by increased domestic production.

> The borders are closed, and the products are stuck in their respective countries. However, our Swedish companies have increased their production to replace certain parts, and it feels good to favor Swedish companies. We´ll take that with us! (Manager 5)

Some substitute products were introduced, and production was changed with more equipment reconditioning. Returns increased due to mortality among older people. All returning equipment was considered dirty on return, as always, but more effort was put into reconditioning. The demand for certain aids increased, for example, breathing aids, hygiene items and beds, especially beds for covid-care units. Also, the distribution of consumable aids increased with more deliveries to make. The deliveries were also picked up and left in places other than usual to facilitate deliveries according to safety regulations regarding COVID-19. More deliveries were made directly to the end user than previously.

> After agreement with the staff or patient/relatives, they have left/picked up on balconies, stairwells, and other places where assembly or disassembly was not required because there was full protective equipment. Lots of surface disinfection of tools between each delivery and patients … (Manager 12)

The stockpiling of aids was also affected, partly due to the smaller volume of different aids available and the introduction of contingency stocks of protective equipment.

The impact on the staff and their well-being vs effectiveness in the AT organization

The participating managers reported that fewer customer service calls and less unnecessary interference affected staff assignments at the service centers. Visits were either canceled or decreased in size, with fewer participants, and some training was canceled or conducted remotely as distance learning. However, some managers noted that distance education alone was not always effective. Premises were adapted, such as no longer providing prescriptions for weighted blankets due to the inability to cater to secure hygiene. Due to high sick leave rates and concerns about staff health, access to staff was limited, and reprioritization of tasks was necessary. Managers also had to prioritize which assignments staff could carry out. The increased sick leave led to more rehabilitation cases among the staff. In some locations, fewer duties resulted in layoffs.

> We have to think about how we want to work forward, which is good; it develops the business and the creativity in it … (Manager 7)

There was a heightened focus on risk assessments in the work environment, with committed management identifying potential risks and developing action plans to mitigate them. While flexible work arrangements in adaptable organizations helped address challenges, they also increased staff workloads due to a faster pace of change.

> … the burden on managers was very high. The number of employees on sick leave due to mild symptoms was high, which required an effort from the managers, and the number of rehabilitation cases increased. (Manager 16)

More tasks, such as meetings and procurement, were conducted remotely from home, saving time but impacting the social work environment, according to managers. Daily contact was limited, affecting networking and integration between colleagues. Distance work counteracts close contact and can

lead to feelings of social isolation. This has called for a changed management strategy with high preparedness for emergency measures. Leading remotely was challenging, and some managers worked onsite to be more hands-on. The participants also emphasized the need for future preparedness through effective planning and development. They highlighted the importance of reflecting on lessons learned during the pandemic, such as increased creativity, alternative solutions and collaborative problem solving. They also expressed a sense of having "put out many fires," indicating the need to focus on long-term solutions rather than just reacting to immediate challenges.

> We have learned a lot, I think, from this pandemic wave. When it calms down, I do hope we can gather and reflect; however, there is still too much 'putting out fires' . . . (Manager 10)

Discussion

This study aimed to explore the impact of a crisis, using the COVID-19 pandemic as a case, on the provision of ATs from the perspective of managers in healthcare organizations. The global pandemic has affected everyone; however this study highlights its disproportionate impact on a specific and vulnerable population and the ecosystem around them – the AT users. The health care manager's roles, knowledge and experiences are crucial in maintaining access to ATs, especially during crises and the pandemic. Effective leadership and workload distribution are essential for managers to ensure the continued provision of AT even during societal challenges and disasters.

One major result category identified was "embracing change of work and navigating new realities," where study participants rapidly adapted to new working methods. This adaptation positively impacted productivity and innovation, offering a new perspective on work within the healthcare sector, as confirmed by other scholars (Fiorini et al., 2022). Occupational therapists and physiotherapists working within AT center services typically perform individualized evaluations, during which the client, family and therapist collaboratively determine the person's goals and customize interventions to enhance the person's ability to perform daily activities. This process requires close patient interaction and the swift adoption of new safety protocols during the pandemic (Mihevc et al., 2022; Robinson et al., 2021). The technicians working in indoor production areas at the AT centers in the study adapted new behaviors to comply with safety regulations. Meanwhile, staff with partly or fulltime administrative tasks in computer-based office environments transitioned to remote work, managing tasks such as meetings, digital prescriptions and follow-ups from home. Although this shift to remote work has proven to be both time-saving and environmentally beneficial, it has also impacted social participation, networking and integration among colleagues. Previous studies (Ishioka et al., 2021; Robinson et al., 2021) have confirmed that (occupational therapy and physiotherapy) staff faced significant challenges during the crisis, including fear of the unknown, social isolation, anxiety, insomnia and changes in social behavior. This study participants reported similar results with the lack of daily contact, which included missing out on small talk, important reflections and meaningful discussions with colleagues. The managers also encountered various difficulties in leading remote teams, which led several of the study participants to work onsite to better facilitate team leadership.

Regarding the category of "Optimizing strategies due to decreased and limiting prescriptions," the participants expressed concerns about numerous unmet needs that could impact patient safety. This concern is supported by the latest report from the UN and WHO (2022), which indicates that many healthcare services were put on hold due to acute measures taken during the pandemic (WHO, 2022). Meetings to test or prescribe technical aids for AT were restricted by time, availability and participants' attendance. The most urgent and necessary repairs of AT were prioritized for patients who attended these meetings and received support at the AT centers. Resource allocation to the most urgent and critical cases was essential. However, participants also voiced concerns about patients who had not received the ATs they needed due to these limitations and decreased prescriptions, and that there might be a care debt that they did know about. The global report on AT (WHO, 2022) highlights that inadequate access to AT significantly affects the health, livelihood and wellbeing of individuals, impacting families, communities and all areas of society (WHO, 2022). The pandemic exacerbated these issues, as the provision of AT was disrupted, leading to unmet needs and potential risks to patient safety. Additionally, a new scoping review on AT service provision underscores the lack of widely accepted guidelines for AT service delivery, which further complicates the situation during crisis (Layton et al., 2024). The review suggests that developing globally applicable guidelines could help standardize AT provision and ensure consistent and appropriate technology delivery even during emergencies (Layton et al., 2024).

The COVID-19 pandemic presented significant challenges across various sectors, including the provision of AT. The widespread shortages of goods disrupted supply chains, affecting the availability of essential safety equipment for staff, such as mouthguards and protective clothing, which were predominantly manufactured abroad. The difficulties in international shipping further exacerbated these issues, as many accessories and spare parts were sourced from different countries. Despite these obstacles, the AT organizations, demonstrated remarkable resilience and adaptability, which was shown in this study. Managers and staff quickly learned to navigate the new landscape, developing and manufacturing various types of equipment locally. This shift not only addressed immediate shortages but also enhanced the overall preparedness of these organizations for future crises. Previous studies have highlighted the broader impacts of the pandemic on healthcare and organizational operations. For instance, a systematic review highlighted the challenges faced by staff and organizations during the pandemic, emphasizing the importance of organizational strategies and employee well-being (Mun et al., 2022). Additionally, research on health care service utilization during the pandemic crisis, underscored the need for adaptive strategies to ensure continued access to essential services (Moynihan et al., 2021). In the context of the elder care, and the most

common group of AT users, the pandemic also underscored the need for effective management and innovative solutions. This has been confirmed in previous research, where a systematic review on elder care management, highlighted the importance of integrated care, quality management, workforce management and ICT management in addressing the challenges faced by elder care (Kokkonen et al., 2012). The development work regarding patient safety was adapted and increased very sudden, which was shown in the study. For example, AT was picked up and delivered directly to patients or healthcare units instead of routing through the AT centers. A Swedish study within eldercare (Dellve & Williamsson, 2022) reported similar findings, noting increased development work for the safety of older adults and digitization of staff planning, while other development aspects either decreased or remained the same. Study participants also expressed that preparedness and resilience for the future have become priorities, focusing on effective planning and development. There was also an emphasis on the need for reflection, as many challenges were overcome during the pandemic. They expressed that they had learned significantly, such as increased creativity, finding alternative solutions and resolving problems collaboratively.

In the last category "The impact on the staff and their well-being vs effectiveness in the AT organization," the analysis showed that there was increased pressure on the organization, resulting in fewer patient visits for consultation and many cancelations at the AT centers. Staff at the AT centers were either ill, reassigned or the consultants had to reprioritize the patients and cases due to cancelations. Managers faced an increased burden due to staff illness and rehabilitation and the deployment of substitutes. They had to handle numerous risk assessments and action plans, which hopefully lead to better, more efficient planning and development for future business.

Strengths and limitations

Data collection for this study was performed during the first wave of the pandemic COVID-19 in Sweden, making it unique as respondents were actively engaged in pandemic-related work during, which strengthens data reliability. The handling of the pandemic in Sweden and the Swedish model för AT provision differ from neighboring countries, serving as a unique example.

The open-ended questionnaire was distributed in October 2020 with one reminder e-mail 4 weeks later, at a time when society and healthcare organizations believed the pandemic was almost over. However, in early November, due to the emergence of the Omicron variant, the managers had to prepare for another winter with precautions and limitations, which affected responses and data gathering.

The survey included free-text answers, which influenced the depth of the responses but provided valuable insights into how the pandemic impacted AT business and provision at different organizational levels. Due to healthcare restrictions, interviews were not possible partly because of a ban on visits and the high workload for managers. Although digital interviews could have been an alternative, the managers were heavily burdened with preparing for another wave of the pandemic. The use of a questionnaire allowed respondents to answer at their own convenience. Additionally, this sampling method ensured that the final sample consisted of participants who could offer their experience and knowledge regarding AT in AT organizations.

Conclusion

In the face of diminished consultations and escalating care responsibilities, AT healthcare organizations have demonstrated remarkable resilience and adaptability. Despite these challenges, managers have gained invaluable insights into optimizing AT provision with a focus on efficiency and sustainability, notably through digital transformation. The knowledge acquired from these experiences holds pivotal importance in guaranteeing the responsiveness of AT services to the evolving needs of patients and society. By embracing proactive innovation and strategically utilizing technology, AT healthcare organizations can continue to deliver high-quality services, even amidst the most challenging circumstances. It is also of great importance that the statements from the managers on the need for reflecting on the lessons learned to increase the preparedness for future crises is followed through so that these lessons are not forgotten.

Acknowledgements

We thank the participants from the Network of Assistive Technology Managers for contributing with their time, experience and wise knowledge – even in the middle of the COVID-19 pandemic.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

K. Baudin PhD http://orcid.org/0000-0003-1593-4220
S. Frennert PhD http://orcid.org/0000-0002-9522-5469
C. Pettersson PhD http://orcid.org/0000-0002-4863-5844
Å. Larsson Ranada PhD http://orcid.org/0000-0002-0761-1942

Author contributions

All authors meet the criteria for authorship stated in the uniform requirements for manuscripts submitted to Taylor & Francis Group: Study concept and design: KB, SF. Analysis and interpretation of data: KB, ÅLR. Drafting of the manuscript: KB, ÅLR, SF; Critical revision of the manuscript for important intellectual content: KB, ÅLR, SF, CP. Final approval of the version to be published: KB, ÅLR, SF, CP. Agreement to be accountable for all aspects of the work: KB, ÅLR, SF, CP.

References

Backman, K., & Kyngäs, H. A. (1999, September). Challenges of the grounded theory approach to a novice researcher. *Nursing & Health*, *1*(3), 147–153. https://doi.org/10.1046/j.1442-2018.1999.00019.x

Baudin, K., Mullersdorf, M., Sundstrom, A., & Gustafsson, C. (2020). The policies of provision of assistive and welfare technology—A literature review. *Societies*, *10*(1), 22. https://doi.org/10.3390/soc10010022

Baudin, K., Sundström, A., Borg, J., & Gustafsson, C. (2021, April 12). Decision-making is in the making! Aspects of decision-making in the area of assistive and welfare technology—A qualitative study. *International Journal of Environmental Research and Public Health*, *18*(8), 4028. https://doi.org/10.3390/ijerph18084028

Blomquist, U.-B., & Jacobsson, D. (2011). *Förskrivningsprocessen fritt val av hjälpmedel egenansvar—Tre olika vägar till hjälpmedel* [The service delivery process of assistive technology—Three ways to get an assistive technology device].

Charlton, R. (2000). Research: Is an ideal questionnaire possible. *International Journal of Clinical Practice*, *54*(6), 356–359.

Convention of Rights for People with Disability. (2016). *Article 32*. Retrieved December 13, 2023, from https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html

Dahlberg, R., Blomquist, U.-B., Richter, A., & Lampal, A. (2014). The service delivery system for assistive technology in Sweden: Current situation and trends. *Technology and Disability*, *26*(4), 191–197. https://doi.org/10.3233/TAD-140416

Dellve, L., & Williamsson, A. (2022, June 30). Development work in Swedish eldercare: Resources for trustworthy, integrated managerial work during the COVID-19 pandemic. *Frontiers in Public Health*, *10*, 864272. https://doi.org/10.3389/fpubh.2022.864272

de Witte, L., Steel, E., Gupta, S., Ramos, V. D., & Roentgen, U. (2018, July). Assistive technology provision: Towards an international framework for assuring availability and accessibility of affordable high-quality assistive technology. *Disability and Rehabilitation. Assistive Technology*, *13*(5), 467–472. https://doi.org/10.1080/17483107.2018.1470264

Fiorini, L., Rovini, E., Russo, S., Toccafondi, L., D'Onofrio, G., Cornacchia Loizzo, F. G., Bonaccorsi, M., Giuliani, F., Vignani, G., Sancarlo, D., Greco, A., & Cavallo, F. (2022, September 2). On the use of assistive technology during the COVID-19 outbreak: Results and lessons learned from pilot studies. *Sensors (Basel)*, *22*(17), 6631. PMID: 36081090; PMCID: PMC9460223. https://doi.org/10.3390/s22176631

Graneheim, U. H., Lindgren, B.-M., & Lundman, B. (2017). Methodological challenges in qualitative content analysis: A discussion paper. *Nurse Education Today*, *56*, 29–34. https://doi.org/10.1016/j.nedt.2017.06.002

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, *24*(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001

Hanna, K., Giebel, C., Cannon, J., Shenton, J., Mason, S., Tetlow, H., Marlow, P., Rajagopal, M., & Gabbay, M. (2022). Working in a care home during the COVID-19 pandemic: How has the pandemic changed working practices? A qualitative study. *BMC Geriatrics*, *22*(1), 129. https://doi.org/10.1186/s12877-022-02822-0

Ishioka, T., Ito, A., Miyaguchi, H., Nakamura, H., & Sawamura, D. (2021). Psychological impact of COVID-19 on occupational therapists: An online survey in Japan. *The American Journal of Occupational Therapy*, *75*(4), 7504205010. https://doi.org/10.5014/ajot.2021.046813

Kokkonen, K., Rissanen, S., & Hujala, A. (2012). The match between institutional elderly care management research and management challenges - A systematic literature review. *Health Research Policy and Systems*, *10*(1), 35. https://doi.org/10.1186/1478-4505-10-35

Larsson Ranada, Å., & Lidström, H. (2017). Satisfaction with and usability of assistive technology in relation to the services delivery process – A systematic review. *Assistive Technology Journal*, *31*(2), 82–97. Published on line 171011. https://doi.org/10.1080/10400435.2017.1367737

Layton, N., Mont, D., Puli, L., Calvo, I., Shae, K., Tebbutt, E., Hill, K. D., Callaway, L., Hiscock, D., Manlapaz, A., Groenewegen, I., & Sidiqi, M. (2021). Access to assistive technology during the COVID-19 global pandemic: Voices of users and families. *International Journal of Environmental Research and Public Health*, *18*(21), 11273. https://doi.org/10.3390/ijerph182111273

Layton, N., Spann, A., Khan, M., Contepomi, S., Hoogerwerf, E.-J., Bell, D., & de Witte, L. (2024). Guidelines for assistive technology service provision – A scoping review. *Disability and Rehabilitation Assistive Technology*, 1–12. https://doi.org/10.1080/17483107.2024.2327515

Lazarus, K. U., & Oluwole, D. A. (2020). Demographic factors, attitude and knowledge of persons with special needs toward COVID-19 in Nigeria: Implications for counselling and social policy. *Emerald Open Research*, *2*(3), 55. https://doi.org/10.1108/EOR-03-2023-0011

Ludvigsson, J. F. (2020). The first eight months of Sweden's COVID-19 strategy and the key actions and actors that were involved. *Acta Paediatrica*, *109*(12), 2459–2471. https://doi.org/10.1111/apa.15582

Mihevc, S., Sicherl, Z., & Galof, K. (2022). The consequences of COVID-19 pandemic on occupational therapy practice: A systematic review. *Journal of Family Medicine and Primary Care: Open Access*, *6*, 182. https://doi.org/10.29011/2688-7460.100082

Ministry of Health and Social Affairs. (2022). *Desicion of support to people with impairments*. Retrieved January 10, 2024, from https://www.government.se/government-of-sweden/ministry-of-health-and-social-affairs/

Moynihan, R., Sanders, S., Michaleff, Z. A., Scott, A. M., Clark, J., To, E. J., Jones, M., Kitchener, E., Fox, M., Johansson, M., Lang, E., Duggan, A., Scott, I., & Albarqouni, L. (2021, March 16). Impact of COVID-19 pandemic on utilisation of healthcare services: A systematic review. *BMJ Open*, *11*(3), e045343. https://doi.org/10.1136/bmjopen-2020-045343

Mun, S., Moon, Y., Kim, H., & Kim, N. (2022). Current discussions on employees and organizations during the COVID-19 pandemic: A systematic literature review. *Frontiers in Psychology*, *13*, 848778. https://doi.org/10.3389/fpsyg.2022.848778

NBHW National Board of Health and Welfare. (2022). *Ehealth and welfare technology in municipalities*.

Nikander, P. (2008). Working with transcripts and translated data. *Qualitative Research in Psychology*, *5*(3), 225–231. https://doi.org/10.1080/14780880802314346

O'Brien, B. C., Harris, I. B., Beckman, T. J., Reen, D. A., & Cook, D. A. (2014). Standards for reporting qualitative research: A synthesis of recommendations. *Academic Medicine*, *89*(9), 1245–1251. https://doi.org/10.1097/ACM.0000000000000388

Pettersson, C., Baudin, K., & Hedvall, P. O. (2022, August). The struggle for access – A qualitative document study of how people using wheeled mobility devices experience exclusion and discrimination. *Disability and Rehabilitation Assistive Technology*, *19*(3), 537–545. https://doi.org/10.1080/17483107.2022.2107094

Pettinicchio, D., Maroto, M., Chai, L., & Lukk, M. (2021). Findings from an online survey on the mental health effects of COVID-19 on Canadians with disabilities and chronic health conditions. *Disability and Health Journal*, *14*(3), 101085. https://doi.org/10.1016/j.dhjo.2021.101085

Polit, D. F., & Beck, C. T. (2012). *Nursing research. Generating and assessing for nursing practice* (10th ed.). Wilson.

Qi, F., & Hu, L. (2020). Including people with disabilities in the COVID-19 outbreak emergency preparedness and response in China. *Disability & Society*, *35*(5), 848–853. https://doi.org/10.1080/09687599.2020.1752622

Rasmussen, B., Holton, S., Wynter, K., Phillips, D. J., David, J. L., Rothmann, M. J., Skjoeth, M. M., Wijk, H., Frederiksen, K., Ahlstrom, L., Anderson, J. E., Harris, R., Conolly, A., Kent, B., & Maben, J. (2022). We're on mute! Exclusion of nurses' voices in national decisions and responses to COVID -19: An international perspective. *Leading Global Nursing*, *78*(7). https://doi.org/10.1111/jan.15236

Rauhala, A. S., Fagerström, L. M., Lindholst, A. C., Sinervo, T. S., Bertilsen, T. M., Bliksvaer, T., Lunde, B. V., Solli, R., Wolmesjö, M. G., & Hansen, M. B. (2022). Which factors are associated with COVID-19 infection incidence in care services for older people in Nordic countries? A cross-sectional survey. *Scandinavian Journal of Public Health*, *50*(6), 787–794. https://doi.org/10.1177/14034948221085398

Rizzo, J.-R., & Beheshti, M. (2021). COVID -19 and visual disability: Can't look and now don't touch. *PM&R*, *13*(4), 415–421. https://doi.org/10.1002/pmrj.12541

Robinson, M. R., Koverman, B., Becker, C., Ciancio, K. E., Fisher, G., & Saake, S. (2021). Health policy perspectives—Lessons learned from the COVID-19 pandemic: Occupational therapy on the front line. *The American Journal of Occupational Therapy*, *75*(2), 7502090010. https://doi.org/10.5014/ajot.2021.047654

Shakespeare, T., Watson, N., Brunner, R., Cullingworth, J., Hameed, S., Scherer, N., Pearson, C., & Reichenberger, V. (2021). Disabled people in Britain and the impact of the COVID-19 pandemic. *Social Policy & Administration*, *56*(1), 103–117. https://doi.org/10.1111/spol.12758

Siette, J., Siette, J., Dodds, L., Seaman, K., Wuthrich, V., Johnco, C., Earl, J., Dawes, P., & Westbrook, J. I. (2021). The impact of COVID-19 on the quality of life of older adults receiving community-based aged care. *Australasian Journal on Ageing*, *40*(1), 84–89. https://doi.org/10.1111/ajag.12924

Smith, E. M., MacLachlan, M., Ebuenyi, I. D., Holloway, C., & Austin, V. (2021). Developing inclusive and resilient systems: COVID-19 and assistive technology. *Disability & Society*, *36*(1), 151–154. https://doi.org/10.1080/09687599.2020.1829558

Smith, E. M., Toro Hernandez, M. L., Ebuenyi, I. D., Syurina, E. V., Barbareschi, G., Best, K. L., Danemayer, J., Oldfrey, B., Ibrahim, N., Holloway, C., & MacLachlan, M. (2022, June 1). Assistive technology use and provision during COVID-19: Results from a rapid global survey. *International Journal of Health Policy and Management*, *11*(6), 747–756. https://doi.org/10.34172/ijhpm.2020.210

Sund, T., Iwarsson, S., Andersen, M. C., & Brandt, Å. (2013). Documentation of and satisfaction with the service delivery process of electric powered scooters among adult users in different national contexts. *Disability and Rehabilitation. Assistive Technology*, *8*(2), 151–160. https://doi.org/10.3109/17483107.2012.699584

Swedish governments official investigations (report) [SOU]. (2020). *Elderly care during the pandemic. Interim report of the corona commission*. Elanders Sverige AB.

WHO. (2022). *Global report on assistive technology*. https://www.who.int/publications/i/item/9789240049451

World Health Organization. (2020). *Coronavirus disease (COVID-19) pandemic 2020*. https://www.who.int/emergencies/diseases/novel-coronavirus-2019

World Medical Association. (2013). *WMA declaration of Helsinki – Ethical principles for medical research involving human subjects*. https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/