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Facing the Future: The Case of the Response Centre of Tromsø Municipality

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Abstract. Introduction. The increased demands put on the health and care services coupled with technological developments have formed an impetus for the implementation of assistive (or, welfare) technologies in the Norwegian health and care sector. Methods. We discuss the organization and functionality of a unit that monitors and coordinates the use of these technologies, named a 'Response Centre' in a Norwegian municipality. Results. We briefly present some of the assistive technology devices in current use, and discuss some ethical dilemmas that arise with their implementation in the care of the elderly and disabled. Conclusion. Assistive technolgies are likely to become increasingly important in the health and welfare sector as the proportion of eldery persons increases.

Keywords. Assistive technologies, welfare technologies, demographic shift, implementation

1. Introduction

Currently, two key factors put a strain on the Norwegian health and care services: 1) increasing costs and 2) lack of qualified staff [1,2]. A main part of health care costs are salaries, other important costs are infrastructure, equipment, and medications. In the years to come, health care costs are likely to increase further as new and costly treatments are developed and the demands of the population increase.

An important factor is that the Norwegian population -as is the case in most Western countries- is ageing. While there were 705,000 people aged 70 or more in 2022 (13% of the total Norwegian population), this number is projected to increase to 1370,000 in 2060 (22.4% of the population) [3]. This shift is due to people living more healthy lives and also to improved health care.

However, as more people will become elderly, so will the number of people with chronic illness. Diseases such as dementia, cancer, diabetes, cardiovascular disorders,

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and COPD are much more common in older people, and the number of patients with these and other diseases will accordingly increase significantly in years to come [2].

This demographic shift has consequences both for finances and for staffing of health care services. A smaller proportion of the population will in the future have to pay the costs for and take care of an increasing proportion of retired and ill people, in addition to the children. Today, there is in Norway 0.7 people (aged 0-19 or 65 and above) for each working-age adult, this number will increase to 0.9 in 2060 [3].

One strategy to make this demographic shift more sustainable may be to further improve public health through the prevention of chronic illnesses in the population. This may involve promoting a healthy lifestyle, helping people complete education and geting/staying longer in employment, and securing good social conditions including quality health and social care services. It will also be important to improve the recruitment, the organization, and the working conditions of people in the health care services, in order to increase the number of people willing to work in health care and reducing the number quitting such work [2].

However, even if such strategies are applied, there will likely be a lack of people in the health and care services in the future, and in 10 years we will need at least 110,000 more people working in this sector just in Norway [2]. In addition, we will lack beds in nursing homes, care facilities, and in our hospitals [4]. Given this lack of health care staff and financial resources that we are already experiencing, many municipalities have started to explore and implement strategies for handling the increased demands on their services [5]. One main strategy is to aid people in staying in their own homes as long as possible. Thus, home-based treatment and care is becoming increasingly important. In many Norwegian municipalities, various technologies for health and care services have been implemented, with the aim of automating, reorganizing and making health and care services more effective. This involves utilizing health care staff better, and increasing the capacity and availability of services, thereby allowing more people to obtain home-based health and care services. This may also have other benefits such as reducing the need for the transportation of patients, and hopefully help increase the quality and safety of services [5].

2. Methods

In this paper, we will present the case of the Response Centre of Tromsø Municipality. The findings are based on publicly available information including web-pages, leaflets and documents [6-8], on an on-site visit, on information about the services given verbally by staff, and on examination of the technologies. No personal health data or other protected information was involved. No recordings were made.

3. Results

The Municipality of Tromsø has approximately 78,000 inhabitants. It is located in the District of Troms, in sub-arctic part of Norway, and is the major city in the region. Main employers consist of the University and the University Hospital, District and Municipal administration, services, and industry including fisheries.

The Response Centre in the municipality of Tromsø was established in late 2020, and in total ten people are employed at the Centre. Its function is to serve as the

municipality's emergency medical communication centre and to coordinate the use of assistive (welfare) technology implemented in the homes of mostly elderly patients.

Some technologies that are supervised by the Response Centre include safety alarms (stationary and mobile) – with or without GPS functionality, digital medication support, sensors in chairs, mats, and beds, motion sensors, voice sensors, camera supervision, and smoke alarms [6-8]. On typical days, one person may monitor calls and respond to alarms, supervising the alarms of as many as 4000 users.

Staff at the Centre respond to calls from its patients and any alarms that may be triggered. The Centre has the medical records of all its connected patients available, so that the staff at the Centre can make better informed decisions when patients are in need of their assistance. If needed, staff will contact emergency services (ambulance) or nurses that can visit the patients in their homes. However, approximately 80% of calls and alarms are handled by staff at the Response Centre remotely. It is also possible to set up the system so that certain alarms are automatically directed to the mobile phones of specific nurses. In these cases, the alarm warning is accompanied by information about the patient that has triggered the alarm, including name and address and type of medical problem/diagnoses.

Digital supervision is carried out through the device Sensio RoomMate [9], and may be initiated by the patient pressing the alarm button on a device or by other types of sensors that have been activated registering for instance, falls, untypical immobility, doors opening, or calls for help. The different sensors are linked through a central unit that is connected to the mobile network or to the broadband. This will trigger an alert at the Response Centre, and the responder can check the on-site camera and talk with the patient. It is also possible to set up planned monitoring at specific times. The image presented to the Response Centre shows the shape and position of the patient, but does not display more detailed information. If there is a suspicion of a serious incident in progress, it is possible to change the mode of the camera so that more detailed images are shown. Digital supervision is particularly relevant for those patients that are unable to communicate verbally because of cognitive decline, stroke or other impairments of language. It is in use in different types of living arrangements, including in patients' homes, care homes, and nursing homes. The use of this technology is regulated and each supervision is automatically noted in the patient's medical record. Currently, there are approximately 30 users in Tromsø.

The mobile safety alarm communicates via the mobile phone network, and the user's location is identified through GPS. When the patient pushes the button and activates the alarm, the Response Centre will contact the user and check [7]. The GPS function can be turned on/off, depending on the needs of the patient. This functionality is mostly used by patients with dementia, and allows next of kin and health care staff to access the patient's position when needed. In Tromsø, there are approximately 1200 users of mobile safety alarms, of which ca. 200 have activated the GPS functionality.

Digital medication support consists of a device that dispenses medications at specified times. In Tromsø, it is mainly the device Evondo E300 that is used [10]. The medication is delivered in a small plastic pouch. The main use is for aiding patients with memory deficits, that may forget to take their medication. Patients can be notified by a flashing light, a verbal message and also by SMS to their phones. If the medication is not taken from the device as specified, an alarm is sent to the home care nurse, who can then follow up in person. It is also possible for the home care nurse to send messages to the patient through the display of the device. In Tromsø, there are approximately 80 users of digital medication support devices.

4. Discussion

Prior research has suggested that it may be challenging to implement new digital technologies in the health care sector, and that many technologies are not sustained beyond the initial phase [11-14]. However, this does not seem to be the case with the technologies described here, which have been put into routine use in many Norwegian communities and elsewhere [9,10]. One reason why these services are sustained over time may be that they often are seen as beneficial by all those involved. Those who finance and organize municipal services, who are able to provide services for more patients with fewer staff, are likely to be positive to these technologies. This may also be the case for health care staff, who may experience reduced stress as they might make fewer home visits on each shift. Similarly are many patients and their relatives, who may feel the patients manage better in their own homes, likely to embrace these technologies [15].

Implementing assistive technologies may involve ethical dilemmas. On one hand, it is in most cases probably best for the patient to stay at home as long as possible, living a normal life in a well-known setting, instead of living in an institution [16]. For the health and care services, and for society in general, delaying institutionalization helps stretch scarce resources [17]. On the other hand, the implementation of this kind of technology, which reduces the need for direct personal contact between health care staff and patients, may increase social isolation and loneliness [18]. For some patients, visits from home care nurses may be almost their only point of contact with other people. Social isolation and loneliness are factors that may reduce well-being and increase the risk of physical and mental disorders [19].

Additional ethical dilemmas related to the implementation of digital technologies in healthcare include privacy concerns, the impact of technology on individuals' autonomy and responsibility (affecting both formal and informal caregivers), as well as social stigma, where users may fear being perceived as frail [18]. Furthermore, issues of trust and mistrust in technologies can difficult their acceptance, highlighting the need for careful consideration of these ethical implications during the deployment of digital health solutions [18]. Thus, the implementation of assistive technologies in home care services requires a constructive interaction between the providers and the users and their families. It is important to take into consideration the benefits as well as the limitations of the technologies, and how their use may impact the users and the services. As the demands gradually increase on the municipal health services in general, and on the home care nursing services in particular, it is likely that service providers and patients will become increasingly dependent on assistive technologies.

5. Conclusions

The Response Centre in the municipality of Tromsø serves an important role in coordinating the use of assistive technologies. Several of the technologies that are in current use (including alarms, medication assistance and digital supervision) are especially helpful for patients that suffer from cognitive decline, and may help delay institutionalization. Also other patient groups may perceive these technologies as useful. As the population ages and more people are in need of health and care services, costs will increase and so will the need for manpower. Implementing assistive technologies as has been done at the Response Centre in Tromsø may help the municipality provide for

more patients with the resources that are available. While many patients are likely to feel that these technologies improve their lives, some might experience more loneliness and social isolation.

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