

Neurologists' Experiences and Attitudes Towards Teleneurology – Has Covid-19 Pandemic Made a Difference?

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Abstract. Teleneurology is an adaption of telemedicine used in neurological practices. Due to the widespread availability of the Internet and the development of information and communication technology (ICT), the use of teleneurology has increased in healthcare systems. This study aimed to determine how the Covid-19 pandemic has affected neurologists' attitudes towards teleneurology as well as their experiences of remote health care before and after the pandemic. The study was conducted as a web-based questionnaire sent to all Finnish neurologists. Two identical surveys were sent via e-mail from the National Neurology Society. The first survey was conducted in spring 2021 and second in spring 2023. The results show that the pandemic moderately increased the use of teleneurology, which enhanced neurologists' technical skills. Neurologists estimated that the use of teleneurology will continue to increase in the future.

Keywords. eHealth, digital services, telemedicine, teleneurology, Covid-19 pandemic

1. Introduction

Information and communication technologies (ICT) have transformed the flow of information in our healthcare systems [1, 2, 3]. This includes the use of telemedicine in neurological practice, also referred to as teleneurology [2, 3,4]

The first cases of Covid-19 infection in Finland were at the beginning of 2020, and by March 2020 the government had advised citizens to avoid all but acute emergency care contacts. Many patients with neurological disorders are at risk of complications from Covid-19 infections [5] and many therefore found it necessary to avoid social contact during the pandemic. Due to the pandemic, the use of telemedicine and especially teleneurology were rapidly increased in order to continue to provide care to patients and minimize social contacts and the risk of infection [4].

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Teleneurology is quickly evolving, and the use of remote neurological consultations has increased through the widespread availability of the Internet [6,7]. To utilize electronic services properly, adequate technological skills and motivation from the population are required [7,8,9]. In addition, more sufficient methods are needed to guarantee healthcare in an optimal time frame.

Here we present data on how the Covid-19 pandemic affected neurologists' attitudes towards teleneurology in Finland. The aim of the study was to evaluate possible changes in the frequency of video appointments and the self-reported level of technical skills needed for video appointments. We also evaluated whether neurologists felt they had received enough support and education to deliver video appointments in the middle of the pandemic in a rapidly changing environment.

2. Methods

Two identical web-based surveys (Webropol) on teleneurology (video appointments) were conducted at the beginning and after the Covid-19 pandemic. We developed a structured web-based questionnaire based on themes explored and discussed in the previous literature. Furthermore, some of the questions used in the present study were based on questionnaires used to evaluate the Finnish telecare model for neurological patients in Finland [10]. Since this was a web-based questionnaire with no possibility of identification of the respondents, according to Finnish legislation, ethics committee evaluation was not required. The first survey was held in April 2021 and the second in April 2023. An invitation to the surveys was sent by email from the Finnish Neurological Society to every member. To avoid recognition of neurologists practicing in small hospitals, gender or age was not asked.

The surveys consisted of 38 questions, of which 2 were yes or no questions, 12 multiple-choice, and 24 5-point Likert scale questions (1=completely disagree and 5=completely agree). Some of the questions offered the possibility to choose more than one answer, and in five questions there was an option to expand the answer by leaving a written comment. Also, at the end of the survey there was a possibility for free comments.

3. Results

A total of 36 neurologists replied to the 2021 survey and 29 replied to the 2023 survey. In total, 95% of respondents of the first survey and 90% of respondents of the second survey worked in public health care. Of all respondents in 2021, 92% were specialists and 8% were residents. In the 2023 survey, the corresponding figures were 86% and 14%. In the first survey, 49% of respondents were in management/chief positions. In 2023 the corresponding rate was 31%.

All hospital districts in Finland were represented. In the 2021 survey, 58% of respondents worked in university hospitals and 38% in central hospitals. In the 2023 survey, 69% worked in university hospitals and 21% in central hospitals. There are 586 members of the Finnish Neurological Society, including other neurological specialists, such as neurosurgery, child neurology and neurophysiology, but only neurologists were asked to participate. We approximated that about 150 neurologist work in the public sector.

In the 2021 survey, 28% of respondents had held remote appointments already before the pandemic, whereas 31% started during the pandemic. About 40% of respondents in both surveys had never held remote appointments. In the 2023 survey, the number of respondents who began remote appointments during the pandemic increased by 10%. In the first survey, 68% of respondents had experience having first appointments with patients remotely, but in the second survey, the result was only 28%. In the 2021 survey, when asked if neurologists were excited about remote appointments, in total 67.5% agreed. This percentage dropped to 52% in 2023. On the other hand, respondents agreed more with the statement that remote appointments were technically easy in 2023 (58%) compared to 2021 (47.5%). Responses to the question “Do you find remote appointments reliable” did not remarkably differ between the surveys. Neurologists were satisfied with the technical application of remote appointments: 23% considered them to be technically very easy to carry out, and this figure increased by 6 percentage points in the second survey. Furthermore, lack of use of remote appointments decreased from 13% to 3% during the pandemic. In both surveys, most respondents (77.5% in 2021, 79% in 2023) estimated that the number of remote appointments would increase in the future.

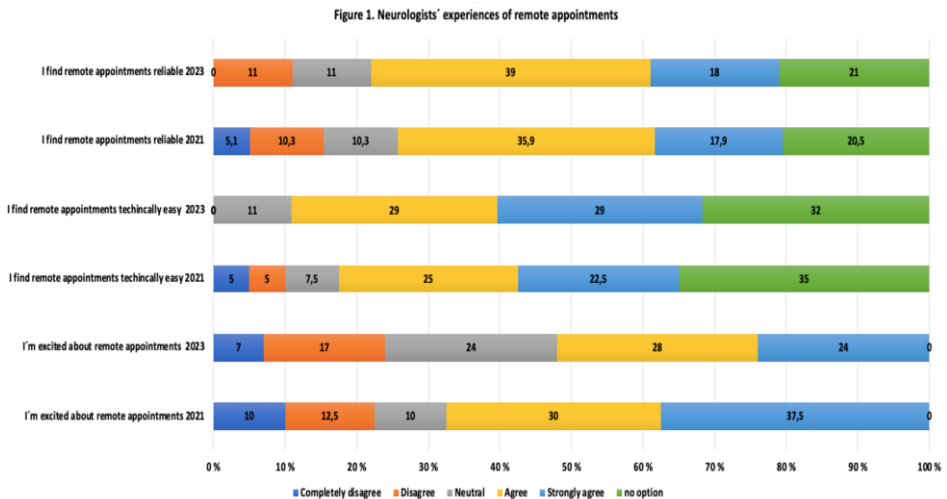


Figure 1. Neurologists were asked about their attitudes and experiences of remote appointments.

4. Discussion

There have been reports of a drastic increase in the use of teleneurology due to the Covid-19 pandemic [5,11,12,13], but this is, to our knowledge, the first questionnaire study to compare neurologists' opinions and attitudes towards teleneurology during the first year of the pandemic and after. A worldwide increase in teleneurology did occur before the pandemic, although this varied from country to country depending on local regulations and restrictions [14,15]. Unlike in Finland, especially in the USA, supportive actions

regarding insurance policies and doctor's jurisdictions were more favourable towards the use of teleneurology before the pandemic [5,11,14,16,17]. In Finland, the Covid-19 pandemic did not change the legislation regarding teleneurology [18]. In some countries, such as the USA, United Kingdom, Australia, and India, it was challenging or even illegal on some levels to use telemedicine [14,15,16].

Based on our results, the Covid-19 pandemic increased the use of teleneurology by only 10%, while at the same time neurologists' self-reported ICT skills increased by 6%. On the other hand, excitement about teleneurology decreased by 15%, most likely as video appointments became routine among certain patient groups. It might be assumed that teleneurology has increased internationally also because of eased legislation [5,11,14,16,17]. In Finland, however, teleneurology has increased mainly due to the need to reduce the number of face-to-face visits [12,13]. During the pandemic, neurologists in Finland were expected to treat patients via video visits, even though some were not ideally suited to remote contacts [5,19,20,21]. Based on our results, in the early stages of the pandemic in 2021, 68% of neurologists also treated patients' first visits remotely due to the pandemic, compared to just 28% in 2023.

We cannot be certain whether the respondents to the first and second surveys were the same, but of the neurologists who responded to the 2021 survey, 92% were specialists and 8% were residents. In the 2023 survey, the corresponding figures were 86% and 14%, so it seems that the respondents were mainly more experienced neurologists in both surveys. In the first survey, 49% of respondents held a management/Chief position. In 2023 the equivalent rate was 31%. Since there are only 2 years between the surveys, we assume that of those 31%, many are respondents who have answered both surveys. Teleneurology, when correctly used, makes the physicians' work more efficient [4]. However, it requires both doctors and patients to learn the technicalities to achieve its full potential [4,5,11]. According to our results, 23% of neurologists evaluated in the first survey that remote appointments are technically very easy to implement. This number increased by another 6 percentage points during the pandemic, and ICT inactivity decreased by 10 percentage points. Finnish neurologists' ICT skills developed during the pandemic, and as with anything new, the initial enthusiasm and excitement waned during the pandemic.

We conclude that teleneurology has taken at least a small leap forward due to the Covid-19 pandemic in Finland. Neurologists found video appointments technically easier to use and more of an everyday tool than prior to the pandemic. Most neurologists estimated at the beginning and at the end of the Covid-19 pandemic that the number of remote appointments will increase in the future.

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