

## ORIGINAL REPORT

CLINICIANS' INITIAL EXPERIENCES OF TRANSITION TO ONLINE  
INTERDISCIPLINARY PAIN REHABILITATION DURING THE COVID-19 PANDEMIC

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**Objective:** Public health legislation during the COVID-19 pandemic has resulted in forced transitioning to the use of remote care in order to continue the provision of pain rehabilitation worldwide. The objective of this study was to gain insight into clinicians' initial experiences with the provision of interdisciplinary pain rehabilitation via videoconferencing.

**Design:** Observational, cross-sectional design.

**Participants:** Twelve team members (specialists in rehabilitation medicine -MD-, psychologists, physiotherapists and occupational therapists) from a tertiary expertise centre in pain rehabilitation.

**Methods:** Quantitative and qualitative data were collected via a digital survey. Theme-based content analysis was performed for qualitative data.

**Results:** The themes that emerged were: the compulsory context; prerequisites for proper use of videoconferencing methods, which are strongly associated with the clinicians' experiences; changes experienced in specific components of pain rehabilitation; and overarching changes experienced, including opportunities and limitations (sub-themes: therapeutic relationship, system involvement, efficiency, hands-on possibilities, interdisciplinary teamwork, and formalities). Overall, clinicians expressed moderate agreement with the statements that the quality of the pain rehabilitation programme can be maintained using videoconferencing, and that the COVID-19 pandemic offers opportunities for growth and innovation in telehealth.

**Conclusion:** It is feasible to provide valid and satisfactory pain rehabilitation via videoconferencing. This study identified facilitators and barriers to the use of videoconferencing, and great potential for integrating aspects of telehealth into standard care after the pandemic.

## LAY ABSTRACT

Legislation during the COVID-19 pandemic forced transitioning to remote care to continue pain rehabilitation treatment. In this study, first experiences with interdisciplinary pain rehabilitation by videoconferencing were gathered. Both qualitative and quantitative data were collected from team members of a pain rehabilitation team via a digital survey. Overall, clinicians reported that videoconferencing is a valid way to continue care in times when legalisation does not allow for standard face-to-face care. Furthermore, clinicians see opportunities to integrate aspects of telehealth into standard care after the COVID-19 pandemic. However, several limitations and restrictions have been experienced, such as the lack of a physical examination and questions about long-term effectiveness of the treatment. In addition, further investigation is needed to investigate whether pain rehabilitation provided by videoconferencing reaches quality standards of regular care.

**Key words:** rehabilitation; pain; telemedicine; recovery of function; pain management; chronic disease.

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Individuals with chronic pain experience a high burden of disease (1, 2). Contemporary pain rehabilitation programmes consist of interdisciplinary face-to-face sessions addressing the biopsychosocial components of pain in order to improve daily-life functioning (3–5). Several

research groups are studying the (added) value of digital solutions (e.g. smartphone apps) and testing such digital alternatives (e.g. internet-based programmes, remote consultation) (6–10). Systematic reviews have addressed the efficacy of digital interventions for chronic pain management, with promising results (11–13). Compared with face-to-face therapy, internet-based solutions seem to produce equivalent effects (14). However, most digital pain rehabilitation interventions are monodisciplinary (e.g. stand-alone cognitive behavioural therapy or physiotherapy) and the level of guidance varies from self-guided to tailored-feedback programmes (11). There has been little research regarding interdisciplinary treatment approaches (15). Clinical cases requiring interdisciplinary care are inherently more complex, and digital care may be considered insufficient. Little is known about clinicians' experiences with digital solutions, and the potential facilitators and barriers to these, which could offer guidance for clinicians planning to use remote online pain rehabilitation.

Now, amidst the COVID-19 pandemic, the situation has changed abruptly; teams worldwide have to use remote strategies, as face-to-face care within pain rehabilitation has been strongly discouraged. Experts worldwide agree that pain rehabilitation should continue despite current legislative measures (16–18). In practical terms, in the Netherlands, this was only made possible by a rapid change in legislation by the Dutch Healthcare Authority, which came into effect immediately after the outbreak of the pandemic, to allow omission of the minimum requirement criterion of a face-to-face consultation with the specialist in rehabilitation medicine (MD), for reimbursement of care. Most patients prefer any type of care to no care at all (19) and are grateful for any guidance they can get. This especially applies to patients with higher levels of anxiety, depressive symptoms and pain catastrophizing, which may even exacerbate during this pandemic, worsening the disabling pain (18, 20). Telemedicine, or the delivery of care via telephone consultation or videoconferencing, is the preferred method of consultation during the pandemic (16, 18, 19), but must still be personalized to the patient's needs (19).

This article sets out the initial experiences of our interdisciplinary pain rehabilitation team, in a tertiary treatment centre that had not previously used any form of remote healthcare. We describe our experiences to date, including consultation with the specialist in rehabilitation medicine, interdisciplinary screening, pain science education, and the treatment phase. Note that our pain rehabilitation programme was not adapted for transition to digital healthcare, as would be done under normal circumstances, including important steps in design and implementation (21). Thus, the only change in the programme has been the mode of delivery (i.e. from face-to-face to videoconferencing). This article focusses on the initial 4 weeks of experiences, from the perspective of the

clinicians (in this case the medical doctor (i.e. specialist in rehabilitation medicine), psychologist, physiotherapist and occupational therapist), assessed using both quantitative and qualitative methods.

The primary objective of this study is to inform clinicians and researchers on the barriers and facilitators experienced by clinicians in the use of videoconferencing, and the opportunities for growth and innovation. In addition, the study focusses on the experiences and clinical judgements of whether working mechanisms of treatment, and hence quality, can be preserved via videoconferencing, in this highly unusual time when other choices are very limited.

## METHODS

### *Study design*

The study has an observational, cross-sectional design, evaluating clinicians' initial experiences with pain rehabilitation via videoconferencing, collecting both quantitative and qualitative data. As the study did not gather any personal or health-related data, ethical approval was not deemed necessary.

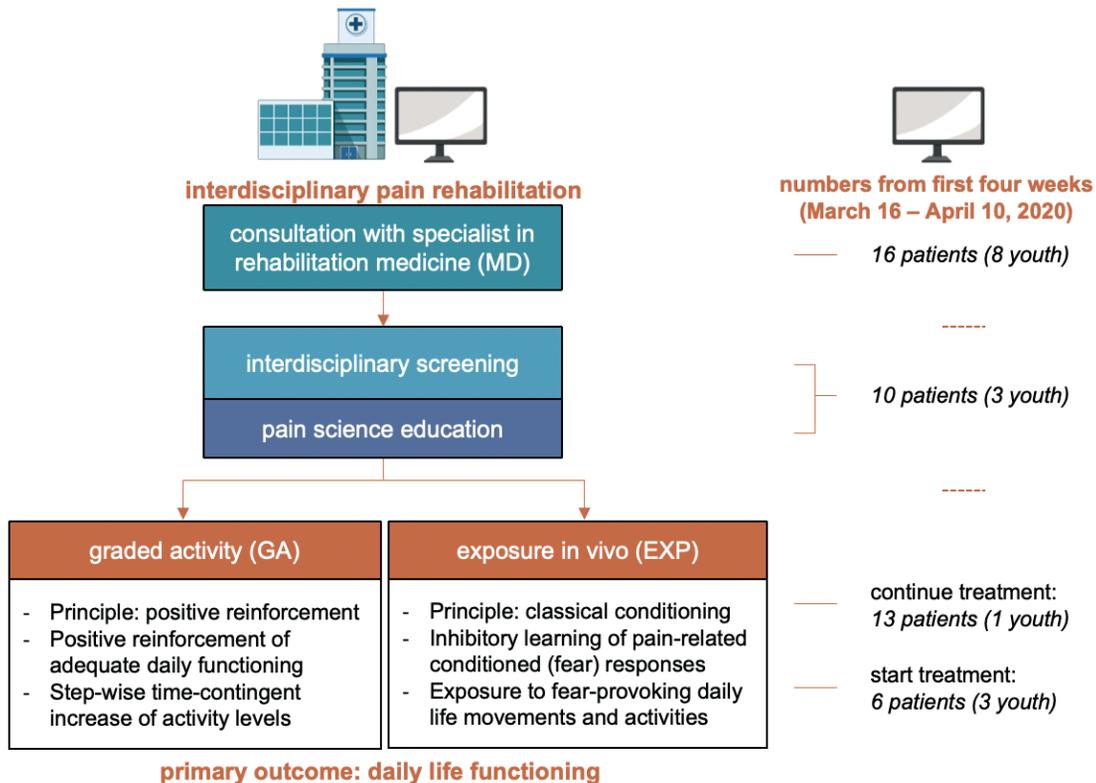
### *Participants and procedure*

All members of the outpatient pain rehabilitation team of Adelante, Maastricht University Medical Centre (MUMC+), were invited to participate in this clinician study. Adelante is a national pain expertise centre, experienced in innovation and scientific evaluation of (chronic) pain rehabilitation. The team is interdisciplinary and consists of medical doctors, specialized in rehabilitation medicine (or physician assistant) (MD); and therapists (psychologists (PSY), physiotherapists (PT) and occupational therapists (OT)). All team members were sent an online survey and were asked to complete it with no reference to personal or health-related information. Data were collected and processed anonymously.

### *Interdisciplinary pain rehabilitation programme*

The structure of the pain rehabilitation programme was now adapted to remote delivery. The only major change was the mode of delivery, which transitioned from face-to-face to videoconferencing. In brief, our programme is an interdisciplinary rehabilitation treatment for adolescents and adults with chronic musculoskeletal pain according to previously published protocols (22–25). **Fig. 1** gives an overview of the programme. After initial selection by the MD based on medical history, physical examination, and treatment expectation, patients are enrolled in interdisciplinary pain screening, through which the primary mode of pain maintenance is established. Adelante, MUMC+, offers 2 treatment options: graded activity (GA) and exposure *in vivo* (EXP). Both GA and EXP are combined with pain science education. The main focus is on reducing disability and restoring daily life functioning, either by positive reinforcement of non-pain-contingent behaviour (GA), or by inhibitory learning of fearful responses associated with pain (EXP).

Regarding the numbers of patients; in 2019, as a tertiary centre for pain rehabilitation, Adelante location MUMC+ saw 354 patients with chronic pain for first medical consultation with the MD, of whom 154 were indicated to continue care with an



**Fig. 1.** Overview of the interdisciplinary pain rehabilitation programme and numbers to date. *Left:* the different components of the programme and the main principles differentiating graded activity (GA) from exposure in vivo (EXP). *Right:* the numbers of patients who agreed to continue or start treatment via videoconferencing during the initial 4 weeks (i.e. the time of this evaluation). Note: to date, none of the patients has progressed to the next component. Thus, at the time of this evaluation, all patients, except for those presenting for consultation, had had at least 1 face-to-face session (e.g. for consultation with the specialist in rehabilitation medicine (MD), for multi-disciplinary screening, and/or to start treatment).

interdisciplinary screening, and 101 subsequently commenced treatment (approximately two-thirds were adults, and one-third adolescents). Approximately 75% of patients were treated with EXP, while 25% were treated with GA. **Box I** presents the programme in more detail.

#### Measures

A survey was created, consisting of a mixture of ratings and open-ended questions. The survey addressed practical experiences with use of, and switching to, videoconferencing; general experience with pain rehabilitation and videoconferencing.

#### Box I. Treatment protocol for pain rehabilitation: traditional and telemedicine

Traditionally, pain rehabilitation is a face-to-face, interdisciplinary programme for adolescents and adults with chronic musculoskeletal pain. The main focus of interdisciplinary rehabilitation treatment is reducing disability and restoring daily life functioning. Over several locations, Adelante provides the full spectrum of evidence-based rehabilitation options for chronic pain: graded activity (GA), Exposure in vivo (EXP) and acceptance and commitment therapy (ACT). The current survey involves Adelante location Maastricht University Medical Centre (MUMC+), where GA and EXP are provided. GA uses principles of operant conditioning, resulting in positively reinforcing healthy and adequate daily functional activities performed by the adolescent or adult and a stepwise time-contingent increase in the adolescent's or adult's activity levels (33). EXP uses principles of classic conditioning and cognitive behavioural techniques to restore the normal pattern of daily functioning, by reducing pain-related fear and catastrophic thinking, through exposing the adolescent or adult to fear-provoking daily life activities and movements (32–38). During the initial medical consultation the specialist in rehabilitation medicine (MD) assesses the full medical history and current pain-related complaints, disabilities and medication used. A physical examination is performed to identify potential red flags and to evaluate the subject's potential physical capacity to perform daily activities. Furthermore, questionnaires (*Nederlandse Dataset Pijnvalidatie/Dutch Dataset for Pain Rehabilitation*) provide additional information to support the biopsychosocial approach. When patients are receptive to a programme focusing on improving functioning despite pain, they are screened by an interdisciplinary team. During this 1-day screening, the occupational therapist (OT) identifies treatment goals and the motivation to restore normal functioning despite pain, the physiotherapist (PT) observes different activities to identify behavioural responses (e.g. fear or avoidance) and the psychologist (PSY) focuses on the behavioural, cognitive and psychological aspects. In addition, during adult screening the patient is asked to rate some photographs of the Photograph Series of Daily Activities (PHODA) (39, 40) to assess perceived harmfulness of various physical activities of daily living. Afterwards, there is a team meeting, which also includes the MD (without the patient), in order to decide whether the patient is eligible for pain rehabilitation (i.e. there are no physical or psychological obstructing factors) and if so, which treatment is indicated (GA or EXP, based on the information collected). After the pain science education, when the patient agrees with the treatment proposal, treatment can start. Both interdisciplinary rehabilitation treatments are conducted by an experienced interdisciplinary team, including an MD, PSY, OT, and PT. Therapists usually work in pairs (1 h 2x/week). Depending on the treatment chosen, programmes have a total duration of 7–10 weeks. Despite the use of videoconferencing, our telehealth approach is consistent with the regular face-to-face procedure, including consultation with the MD, interdisciplinary screening, pain science education and treatment content. The only difference is the method of delivery. MDs and therapists currently use videoconferencing to contact the patient for consultation, screening, education and treatment. For example, a physical examination is not specified for initial intake consultations during this COVID-19 pandemic. The interdisciplinary team meeting following the screening takes place virtually, as does the educational session. During interdisciplinary rehabilitation treatment (GA or EXP), the patient is coached and encouraged in their own environment. In GA, the pain-contingent baseline assessment and stepwise time-contingent treatment schedule of the specific functional activities are performed in the patient's own environment. In EXP, the patient is exposed to activities of daily living and movements in the patient's own home setting to test catastrophic cognitions. Again, during each session, therapists treat the patient in pairs.

rence methods; experiences (over the previous 4 weeks) and clinical judgements (outlook to the next few months) regarding facilitators/advantages/barriers of videoconferencing for pain rehabilitation, both in general and for specific components of the pain rehabilitation programme; clinical implications; and recommendations for future use of videoconferencing in pain rehabilitation. All ratings were answered on a Likert-type scale, ranging from 0 (never/not at all/very unsatisfied/strongly disagree) to 10 (always/very/very satisfied/strongly agree). For open-ended questions, participants were encouraged to report at least 3 items, but were otherwise free in responding. The full survey is available upon request.

#### Data analyses

*Quantitative analysis.* Rating data from the survey were presented descriptively, using means, standard deviations and ranges.

*Qualitative analysis.* Theme-based content analysis was performed based on written answers to the qualitative questions. Two authors (MH and VB) independently analysed data and extracted themes. During an initial discussion, the authors agreed on themes. Subsequently, the authors independently analysed the verbatim transcript and summarized text. Consensus was reached after a second discussion. Two participants were asked for further clarification of 1 of their answers. The analysis was concluded in a final discussion between 4 authors (MH, VB, IT and TM).

## RESULTS

#### Description of sample

The survey was completed by all clinicians (4 MD, 3 PSY, 2 PT and 3 OT). Clinicians reported a mean of 9.5 years of experience in pain rehabilitation (standard deviation (SD) 5.0, range 1–18 years). However, as measured on a NRS ranging from 0 (no experience at all) to 10 (great experience), they had very little prior experience with videoconferencing in the context of pain rehabilitation (mean 0.1, (SD 0.3), range 0–1), and their prior experience with digital tools for videoconferencing in other contexts was moderate (mean 5.8 (SD 1.7), range 2–8). As measured on a NRS range from 0 no experience at all – 10 great experience.

#### Practicalities

Prior to the COVID-19 pandemic, the clinicians reported moderate dread of the use of videoconferencing in pain rehabilitation (mean 4.0, (SD 2.1), range 0–7) and were only moderately comfortable with videoconferencing (mean 5.5, (SD 1.8), range 3–9). After 4 weeks of experience, the clinicians reported feeling much more comfortable with videoconferencing (mean 7.8, (SD 1.0), range 6–9) and the effort needed to switch to videoconferencing was perceived as relatively low (mean 3.5, (SD 1.8), range 0–6). Relatively few problems were experienced with the information technology (IT) (mean 3.4, (SD 2.5), range 1–7) and, even if experienced, they barely affected the experience with videoconferencing (mean 1.9, (SD 1.8), range 1–5). Fifty-three percent of videoconferences were

performed by the clinician at the hospital vs 47% in their own home. The total time spent on sessions via videoconferencing (including preparation and administration) was similar to that spent on regular face-to-face sessions.

#### Initial experiences of pain rehabilitation via videoconferencing

Although it was hypothesized that there would be distinct themes for the different components of pain rehabilitation, analysis revealed overlapping themes. In addition, themes regarding actual experiences (over the previous 4 weeks) were comparable to clinical judgements (outlook to next few months). Hence, no distinction was made.

The following themes emerged, and are described in more detail below:

- The compulsory context created by the COVID-19 pandemic
- The prerequisites for proper use of videoconferencing methods affect experiences
- The changes experienced in specific components of pain rehabilitation
- The overarching changes experienced, including both opportunities and limitations.

#### Compulsory context created by the pandemic

There was general agreement that the introduction of videoconferencing was the only way to be able to continue providing pain rehabilitation and care to patients in need during the pandemic. This was only possible because of a change in legislation, since, originally, a face-to-face consultation including physical examination was a minimum requirement for reimbursement of care (via health insurance). However, due to the COVID-19 pandemic, the Dutch Healthcare Authority (NZa) loosened this criterion.

#### Prerequisites for proper use of videoconferencing methods

There was a strong sense among clinicians that their experiences with provision of pain rehabilitation via videoconferencing were tightly linked to whether the methods could be used properly. Several prerequisites were identified (related to technology, the environment, the patient, and the clinician or team) and are presented in **Table I**. In addition, complicating factors experienced, related to the use of videoconferencing for interdisciplinary pain rehabilitation, were identified and are shown in **Table II**.

#### Changes experienced in specific components of pain rehabilitation

*Initial medical consultation.* In the ratings, MDs report overall moderate to high confidence (mean 7.3, (SD 1.5), range 6–9) and satisfaction (mean 6.7, (SD 1.5), range 5–8) with this method of consultation. However,

**Table I.** Prerequisites for proper use of videoconferencing methods in interdisciplinary pain rehabilitation

Technology
Stable internet connection
Availability of a computer, smartphone or tablet with a camera and microphone
Use of videoconferencing software that ensures privacy*
Environment
Limited distractions from environment for patient (e.g. children playing)
Inventory of other people in the room of the patient to be able to gauge responses and behaviour (even if not directly visible/audible)
No other people in the room (and/or within hearing-distance) of the clinician
Patient-related
Provision of an active choice to participate in pain rehabilitation via videoconferencing methods for the patient
Provision of information on practical use and contents of pain rehabilitation via videoconferencing
Openness to and motivation for the use of videoconferencing
Openness to the treatment rationale
Adequate Dutch communication skills
Able to express feelings and thoughts without close proximity of therapist
At least moderate self-efficacy skills
Clinician- and team-related
Feeling comfortable with use of videoconferencing
Open, flexible attitude towards a different mode of treatment delivery
Preferably, teams should have settled in already and be open to give each other feedback
Able to use alternative ways to keep in touch with each other, due to lack of informal contact

\*Compliant with the applicable privacy regulations (e.g. General Data Protection Regulation (GDPR) in Europe, Health Insurance Portability and Accountability Act (HIPAA) in the USA).

at the time of this evaluation, only 2 out of 16 initial consultations via videoconferencing included (parts of) a physical examination. For instance, it was possible to determine the Beighton score or gain an impression of functional movements (e.g. by asking the patient to bend their back, or stand on one leg). However, the general lack of possibility to perform a full physical examination was considered a severe restriction, and sometimes even a reason to decide to postpone treatment.

*Interdisciplinary screening and pain science education.* In general, initial experiences with videoconferencing for screening were positive. Individual consultations with the PT, OT and PSY were satisfactory, although for PTs the lack of physical examination and functional observation was problematic in some cases. Photographs used to assess the perceived harmfulness of daily activities (i.e. the Photograph Series of Daily Activities (PHODA), see Box I) could be shown by sharing screens. For pain science education, mainly advantages were reported, including

**Table II.** Experienced patient-related complicating factors for the use of videoconferencing methods in interdisciplinary pain rehabilitation

Patient-related complicating factors
Limited access to internet and/or a device with a camera or microphone
Language difficulties
Medical comorbidities
Psychiatric comorbidities
Cognitive problems
Restricted willingness to perform feared activities without therapist being present

that slides with patient-tailored information (e.g. jointly completed during education) could be shared and distributed immediately after the session; and, if the patient consented, the session could be recorded and/or joined by significant others. Some therapists were critical about the level of personalization of the education, which may be higher in face-to-face sessions.

*Treatment phase.* Therapists missed being physically present, being able to observe a patient's performance in real life, and being there to provide (a sense of) safety. Functional observations are necessary to provide the patient with feedback about observed pain-related avoidance or safety behaviour. Therapists also missed being able to observe spontaneous behaviour during the informal parts of the session, as well as the non-verbal communication (e.g. a light touch of the hand or providing a glass of water after a fearful experience).

*Specific to graded activity.* Clinicians preferred the initial sessions to be face-to-face to explain the principles of GA, in order to achieve a thorough understanding of the difference between pain- and time-contingent functioning. Registration of pain-contingent functioning to establish a baseline can be performed at home. Designing time-contingent schemes is highly feasible using shared screens, and videoconferencing can easily be used for the subsequent coaching of time-contingent functioning.

*Specific to exposure in vivo.* A clear advantage is that specific activities can be performed in the patient's home, which may enhance generalization. Also, when a behavioural experiment is performed in public, privacy is better via videoconferencing than during a session outside the hospital, as the conversation between the patient and 2 therapists can less easily be overheard by outsiders. However, several disadvantages of EXP by videoconferencing were reported, especially in the early stage of treatment. Therapists missed the extensive range of activities that can be chosen to design behavioural experiments in the hospital setting, and therefore doubted whether the ultimate "mismatch" (between the catastrophic expectation of the patient and the actual experience; optimizing inhibitory learning during EXP) would be as strong as during face-to-face behavioural experiments. Furthermore, therapists were sceptical as to whether patients would be willing to perform feared activities without a therapist physically present. In addition, therapists missed the opportunity to perform activities together with the patients, inducing playful activities. Some therapists further mentioned that they did not feel confident when patients performed specific behavioural experiments in the home (i.e. without being able to join in). Finally, therapists reported more difficulties observing subtle safety behaviours, such as holding one's breath or keeping water or medication close.

*Generalization and relapse-prevention.* For both GA and EXP, videoconferencing seems suitable for sessions

evaluating generalization and relapse-prevention. In case of relapse, a session by videoconferencing is convenient, and even often mentioned as the method of first choice for prevention of relapse.

*Overarching changes experienced*

*Therapeutic relationship.* Some patients may feel more at ease if they can remain in their own environment. However, regarding the therapeutic relationship, disadvantages of videoconferencing were mostly reported compared with face-to-face care. Clinicians experienced that the lack of face-to-face contact could result in lower-quality conversations (e.g. less depth), greater emotional distance between therapist and patient, and less possibilities to encourage and reinforce. Furthermore, the lack of (or difference in) informal and non-verbal communication during videoconferencing was reported as a hindrance to establishing and maintaining a good working alliance. Clinicians reported moderate importance of having an already established therapeutic relationship for the quality of rehabilitation via videoconferencing (mean 6.4, (SD 1.9), range 2–9).

*System involvement.* Clinicians reported that it could be of great value to have an inside look at the patients’ own environment. And, that it was easier to have significant others or siblings participate in the session. However, these aspects may also violate privacy, and, if the patient’s environment is not safe, this can negatively affect treatment. On the other hand, system interactions (i.e. with partner, sibling or parent) may be more difficult to observe via videoconferencing and more difficult to discuss in the presence of other individuals.

*Efficiency.* When using videoconferencing, there was less travel time, both for the patient and the therapist. It also required less time off work or school for patients, and provided the possibility to treat patients outside the region. In addition, videoconferencing required less physical space at the treatment facility, and made it easier to get in touch during follow-up. Videoconferencing sessions

were found to be easiest when using 2 monitors/screens: one for contact with the patient, and one for reporting.

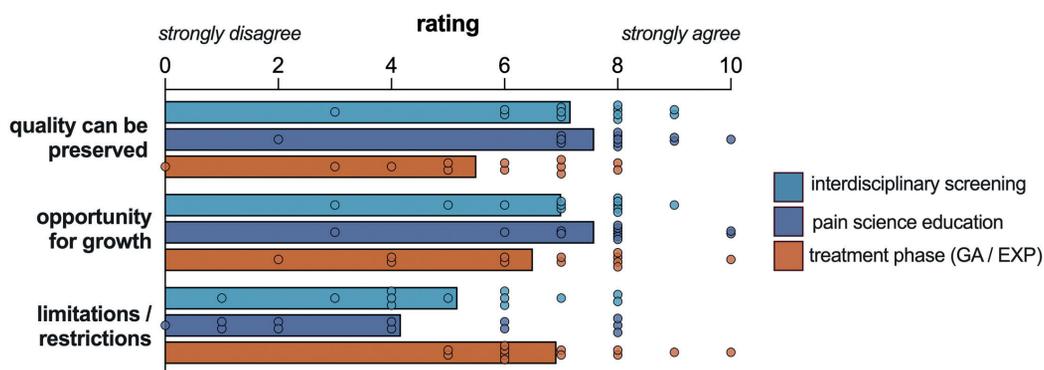
*Lack of hands-on possibilities.* MDs and PTs clearly reported that the lack of physical examination, specific tests and functional observation of movement (e.g. observation of sitting, standing up or walking) posed limitations in the initial consultation, interdisciplinary screening and the treatment phase. This also poses a risk, as determination of the patient’s functional capacity is critical to ensure safety, especially when they lack capacity due to medical comorbidities.

*Interdisciplinary teamwork.* Satisfaction with interdisciplinary teamwork via videoconferencing was high (mean 7.8, (SD 1.6), range 4–10), as was its reported ease (mean 7.9, (SD 1.4), range 5–10). The therapists reported the lack of informal contact with each other and the brief treatment-related discussions during and after treatments as hindrances. A suggested example to ameliorate teamwork was to end the session with the patient a couple of minutes early and to use the remaining time for feedback with the co-therapist.

*Formalities.* In the clinicians’ experience, a different etiquette applied to the use of videoconferencing, and both the team and the patient should be (made) aware of this etiquette. For instance, it helps to allow each other to finish speaking (and thus to take turns speaking), to introduce all individuals in the room, to mute yourself when you are not speaking and to explain why you do that (e.g. to limit background noise), and to explain to the patient that you make notes during the conversation (and that is why you are sometimes looking away from the camera).

*Outlook*

Obstacles and hindrances were reported clearly, and clinicians reported moderate agreement with the statement that the quality of the pain rehabilitation programme can be preserved via videoconferencing, especially for the interdisciplinary screening and pain science education,



**Fig. 2.** Self-reported data on agreement with the statements about whether quality can be preserved using videoconferencing, whether the COVID-19 pandemic provides opportunity for growth and innovation, and whether the pandemic causes limitations. Data are presented per component of pain rehabilitation and reflect means as well as individual data-points.

**Table III.** Recommendations to improve clinicians' use of videoconferencing in pain rehabilitation

Recommendations for clinicians
Be open to new developments, face the challenge, and enlarge your experience
Use your creativity
Prepare your patients for this new method of care
Develop and expand the use of other digital possibilities (e.g. apps, websites, videos)

and a little less for the treatment phase (with only a few clinicians disagreeing with this statement; see **Fig. 2**). The same pattern emerged for the statement that this pandemic offers opportunities for growth and innovation: there was moderate agreement and only a few disagreed. In terms of limitations, clinicians, on average, did not agree that the pandemic posed severe limitations for interdisciplinary screening and pain science education, but they did report severe limitations for treatment (all clinicians agreed to some degree). When asked to about the outlook for the future, clinicians reported it was likely that they would continue to use videoconferencing for pain rehabilitation after the COVID-19 pandemic (mean 7.3, (SD 1.7), range 3–9), and that it was most important to be open, innovative and creative to get the most out of this digital treatment protocol. For instance, if functional observation methods are lacking, one could suggest that the patient asks someone else to make a video of them performing the activity. Further recommendations for clinicians in planning the use of videoconferencing methods are provided in **Table III**.

## DISCUSSION

Legislative measurements during the COVID-19 pandemic have resulted in strained medical resources, creating a dilemma as to how to continue “normal” care. Chronic pain rehabilitation, specifically, has been hindered, as it is considered non-urgent care. In addition, patients may be reluctant to travel, may be fearful of infection, and experience restrictions in the possibility of engaging in pain management procedures and encounters with interdisciplinary teams (20). Several guidance papers and best practices have rapidly emerged, offering advice and emphasizing the importance of continuing care for patients in rehabilitation in general, as well as for patients with chronic pain specifically, acknowledging the possibilities of remote care using telehealth (16–19, 26). In addition, recommendations on how to conduct outpatient telemedicine rehabilitation have been published (27). However, there is a lack of publications regarding the application of, and experienced barriers and facilitators of, clinicians applying telehealth in chronic pain rehabilitation.

Despite an almost total lack of experience in telehealth, our tertiary centre for pain rehabilitation transitioned the face-to-face interdisciplinary pain rehabilitation programme to an online one employing videoconferencing. This paper describes the initial experiences of our interdisciplinary pain rehabilitation team, who were in agreement

with the message that it is feasible to provide satisfactory pain rehabilitation care using videoconferencing methods. Acknowledging that videoconferencing alone is not the most ideal for pain rehabilitation, it is experienced to be a valid way to continue care in times when legislation does not allow for physical contacts. Both opportunities and restrictions have been reported.

In addition to the compulsory context of the COVID-19 pandemic, which does not provide any options other than remote care, clinicians clearly reported that the prerequisites for proper use of videoconferencing methods were tightly linked to their experiences. Key prerequisites for the proper use of videoconferencing methods include reliable and robust technological methods, and well-informed patients and therapists who are open to, and have the capability to participate in, digital delivery of care. Other prerequisites that may appear obvious to some, but are intended to provide much-needed guidance to teams that are hesitantly considering the transition, are also provided, including ways of ensuring a well-suited environment and preparing the patient and the team.

Regarding the specific components of our pain rehabilitation programme, the team experienced that delivery of some components was more feasible than others via videoconferencing. For example, the quality of, or satisfaction with, the consultation by the specialist in rehabilitation medicine (MD), interdisciplinary screening, and pain science education via videoconferencing were experienced markedly well. One of the reasons for this may be that clinicians found it easier to involve significant others in these sessions, which could be quite relevant as a source of information, but also as a co-patient. However, the possibilities for physical examination and observation of functional movements were found to be very restrictive, and these are especially relevant in excluding red flags or comorbidities, and to ensure functional capacity during consultation and screening; during treatment via videoconferencing one also lacks the possibility to observe safety behaviour. These results are acknowledged in a narrative review on telehealth in physical medicine and rehabilitation (28). However, it is believed that creative thinking could improve current practice (19, 29).

With respect to the treatment phase, mostly limitations were reported, as well as the lowest confidence that quality of treatment could be preserved. This was especially the case for EXP and less so for GA. Most limitations applied to the use of videoconferencing during the initial treatment sessions, when face-to-face treatment was clearly preferred, because of better possibilities to build a therapeutic relationship and more refined explanation of treatment principles. For the behavioural experiments in EXP, face-to-face contact has the advantage that one is able to choose a wider range of activities and to better coach the patients to perform feared activities. Furthermore, performing enjoyable activities together (playfulness) typically results in reduced focus on pain and other sensations, and provides positive experiences that help the patient to fully engage

in subsequent behavioural experiments. Clinicians experienced reduced possibility for this via videoconferencing. In addition, initial sessions are preferably face-to-face, as it is easier to provide patients with a large “mismatch” between what they expect and what will actually happen. It is known that experiencing this “prediction error” is a core working mechanism of EXP treatment; a prerequisite for learning, preventing relapse after treatment (30). Therapists often refer to this as a “wow” experience, since patients usually react very surprised when they realize they are able to perform such a demanding activity. Typically, these “wow” experiences, which illustrate the EXP treatment rationale, consist of behavioural experiments involving a demanding activity, such as sports. However, the necessary facilities are lacking in the home situation. During later treatment sessions, it is believed that videoconferencing is more applicable and even has advantages over face-to-face treatment; for example, it allows training in specific activities to be provided in the home situation, which may increase generalization. For prevention of relapse, videoconferencing was frequently mentioned as a preferred method of contact.

Overall, most clinicians expressed moderate to strong agreement that the quality of the specific components of the pain rehabilitation programme can be preserved using videoconferencing, and that the COVID-19 pandemic also leads to opportunities for growth and innovation. However, whereas the quantitative data revealed a predominantly positive or optimistic attitude towards the use of videoconferencing, the qualitative data provided a richer and more detailed picture, describing that several serious limitations and restrictions were experienced, especially with regards to the lack of a proper physical examination during the initial medical consultation, and in the treatment phase. Related to the treatment phase, clinicians reported being sceptical about whether this method of treatment delivery is sufficient for a long-term successful outcome, as generalization of treatment principles to functioning in daily life is a prerequisite for the success of the treatment (i.e. to restore functioning in activities of daily living and participation). It is plausible that behavioural experiments performed at home are less challenging or result in less “violations of expectancy” (i.e. a smaller mismatch between expected and experienced effects that enforce inhibitory learning) and therewith impede long-term effectiveness (30). On the other hand, being able to perform activities in the natural and ecologically most-valid environment, while still guided by a therapist via videoconferencing, might enhance generalization (31). Further studies are needed to address this question. For now, at least, clinicians see opportunities to design effective and valid behavioural experiments, provided that they keep an open mind and use creative thinking, as the fact is that the possibilities for the design of behavioural experiments are unlimited when activities are not limited to the treatment facility.

It should be noted that the current study did not evaluate the programme, but merely gathered initial experiences

from the clinicians’ perspective to provide an example and hence some guidance for other teams, but also to identify topics that deserve more attention. In fact, no previous studies have described the efficacy of delivering pain rehabilitation (GA or EXP) via videoconferencing by an interdisciplinary team. Thus, further research should focus on the patients’ perspective and on the (long-term) effectiveness of videoconferencing methods in pain rehabilitation, including potential differences in generalization. Also of note, is that all patients who were screened, started or continued their treatment with videoconferencing methods so far had been seen at least once face-to-face prior to the pandemic. In addition, whether pain rehabilitation provided via videoconferencing during the COVID-19 outbreak reaches the quality standards and effectiveness of regular care (32–34) warrants further investigation. Based on our initial experiences, there seems to be agreement that videoconferencing alone (in its current form) does not provide the most ideal care. For example, it seems evident that an initial face-to-face medical consultation, including a physical examination, must be part of a pain rehabilitation trajectory. However, given the advantages and opportunities raised in this study, the most interesting question for future research may be less about which form of delivery works best, but instead about how to best integrate and optimize the use of videoconferencing in regular interdisciplinary pain rehabilitation.

### Conclusion

Despite the compelling nature of this transition to remote interdisciplinary pain rehabilitation, and some clear restrictions compared with face-to-face care, videoconferencing is experienced by clinicians as a valid way to continue care in times when legislation does not allow physical contact. Eminent possibilities are foreseen to integrate aspects of telehealth into standard care after the pandemic.

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