

Optimizing Telemedical Care in Neurological Outpatients by Characterizing the Patients' Needs in Physician-Patient Relationship - Content Analysis of Guideline-Based Interviews

Till Hamann (✉ till.hamann@med.uni-rostock.de)

Universitätsmedizin Rostock

Stella Lemke

University of Lübeck

Peter Kropp

Universitätsmedizin Rostock

Florian Rimmele

Universitätsmedizin Rostock

Tim P. Jürgens

Universitätsmedizin Rostock

Fabian Frielitz

University of Lübeck

Research Article

Keywords: logical patients, Recall-Service, Telemedical care, Evaluation portals

Posted Date: March 3rd, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-257724/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at BMC Neurology on July 24th, 2021. See the published version at <https://doi.org/10.1186/s12883-021-02329-y>.

Abstract

Background

The use of new concepts in patient care, such as video-consultation, reminder systems and online-evaluation portals is becoming increasingly important in the physician-patient relation and in the care of outpatients. This study examines the acceptance of these approaches in a neurological setting and characterizes the patients' preferences.

Methods

We analyzed 16 guideline-based qualitative interviews with neurological patients using qualitative content analysis (inductive category formation).

Results

The patients commented on benefits and challenges of integrating new concepts of medical care. They identified advantages of telemedical care, including time savings for both the patient and the physician, the prospect of more intensive care and the possibility of quick response in case of urgent needs. Several challenges were reported, such as the limitations for patients with chronic or complex diseases and limited options for diagnostic procedures (such as physical examination)

For individual neurological patient's needs, telemedical and telecommunication structures could be discussed which support the respective requirements of the patients such as answering questions while having a recall, avoiding of the journey and time-savings. Also, they are rejecting evaluation portals and are skeptical about telecare in the treatment of neurological diseases.

Discussion/Conclusions

The neurological patients can be characterized as individuals with different ideas of an optimal physician-patient relationship. A successful integration of new concepts in medical care depends on fulfilling the individual patient's needs. Regardless of the preferred form of the physician-patient relationship, there are specific instruments that can intensify the relationship. These individual needs of the patients must be inquired about and implemented.

1. Introduction/background

In the neurological outpatient department at the University of Rostock we treat patients with multiple forms of neurological disorders like headache, multiple sclerosis and parkinson's disease. The tertiary academic center is located within a regional capital surrounded by a rural sparsely populated environment necessitating distant travelling for many patients seeking expert medical advice. As waiting times for an appointment have grown over the last years, a missed appointment can have a negative implication on the patient's medical condition. The recent COVID19 pandemic has quickly altered the

necessity to adopt digital tools and integrate new concepts in medicine, especially in the outpatient sector, in order to reduce physical contact [1]. For optimizing the use of a new armamentarium of digital tools affecting the doctor-patient-relationship we aimed to characterize the individual patient's needs in a neurological setting.

Medical care in sparsely-populated areas is becoming increasingly difficult as a result of an ongoing migration from rural peripheries to urban areas. The density of specialists in Germany has steadily decreased in recent years. In 2015, the density of neurologists, psychiatrists and specialists in psychiatry and psychotherapy in large cities[1] was 1:13745. Outside these large cities, the ratio was only 1:31183. Besides, the proportion of elderly increases [2]. The risk of neurological diseases increases with the age of the patients (e.g. the prevalence of dementia [3] or parkinson's disease). Limited facilities and increasing need of neurological care in an ageing population with decreasing mobility in rural regions could imply a greater need for the extensive use of telemedical approaches such as expert chats, video or telephone consultations as has been shown before [4][5][6].

While socioeconomic considerations (such as reimbursement) and medicolegal aspects (such as the legal status of telemedical examinations in regularly scheduled outpatients) have prevented a widespread use of telemedicine in everyday practice before the COVID-19 pandemic, it inflicted the need for minimizing physical doctor-patient contact. As a consequence, the implementation of telemedical applications has been accelerated [7]. However, the use of telemedicine services in everyday clinical practice still varies greatly from country to country due to the different technical infrastructures and health care systems. So, this pandemic, with all its negative medical and social implications, also represents an opportunity for telemedicine.

Footnote:

[1] as defined by the "Bundesamt für Bauwesen und Raumordnung"

2. Materials And Methods

The present study using a qualitative approach was designed to answer 3 central research questions (Figure 1).

For answering the research questions, we conducted interviews based on standard interview guidelines [8]. The patients have been recruited from the Neurological Outpatient Department for movement disorders and pain. This study was approved by the regional Ethics Committee of the University of Rostock (No. A 2017-0186).

Before the interview began, patients had to grant informed consent and they were briefed about the content of the study and possible ethical concerns. The patients were asked to share their thoughts, including expectations and concerns regarding the use of reminder systems, online evaluation portals and the use of telemedicine.

The interviews were conducted in German, written down verbatim according to Kuckartz transcription of content and semantics [9] and analyzed and evaluated with the help of the program "QCAmap" [10]. The results were translated into English

Based on the data and objectives of the study, a qualitative content analysis according to Mayring [11] was chosen to answer the research questions with the help of the technique of inductive category formation. Subsequently, the categories were formed along the interview material using certain selection criteria.

For example, for answering the first research question, all text passages in which the patient expressed themselves in any way about reminder systems were categorized (selection criterion). The categories were formed on the level of "Concrete positive / negative aspects of the reminder systems" (level of abstraction). This procedure was applied analogously for the other central questions. Multiple answers were counted.

The Qualitative Content Analysis resulted in a category system with its respective frequencies. The interviews were also categorized by a second researcher (intercoder).

3. Results

Interviews

The 16 interviews were conducted with patients of our neurological outpatient clinic. A total of seven men and nine women were interviewed. The average age of the subjects was 54.9 years (median: 58.5 years, range: 27 to 87 years, standard deviation: 19.4 years).

Reminder systems

We collected different advantages and disadvantages of reminder systems. 20 text passages were coded to positive aspects, hindering factors were cited in 28 text passages (Table 1). The benefits can be summarized to categories (avoidable causes for missing the appointment, advantages for the patients, etc.). "Avoidable causes of missing the appointment" was the most frequently collected category. The most important avoidable cause, which can be prevented, was missing an appointment by forgetting (8 of 16 interviews; 50 %). To structure everyday life was also mentioned as a central positive advantage of reminder systems (3 of 16 interviews; 18.8%). Nevertheless, for almost 50 % of the neurological patients an added value of the reminder systems could not be recognized directly, because they note down the appointments independently or they aren't forgetful (ever 7 of 16 interviews; 43.8 %). Besides this category ("Not necessary"), also another one ("Not practical") could have been collected frequently.

In the examination of different forms of reminder systems, advantages of a text message (e.g. SMS or e-mail) and a telephone call were named. Altogether 13 advantages were mentioned for text messages and 10 advantages for the reminder call (Table 2). For the calls, the personal form of contact was emphasized (3 of 16 interviews; 18.8%), or the fact that even a missed phone call won't be forgotten (4 of 16

interviews; 25%), the text message impressed by the possibility to read it at an independent time (4 of 16 interviews; 25%) and that it'll be read in any case (4 of 16 interviews; 25%). One patient described this as follows:

"I can call up an e-mail when I want to [...] and I have to react immediately to such a call."

So, partially very similar arguments for both types of reminder could have been collected. A "better way of reminding" wasn't mentioned.

Telemedical care

37 aspects could be determined, which were seen as advantages of telemedical treatment (Table 4). Time-saving for patients (7 of 16 interviews; 43.8%) and the avoiding of the journey (8 of 16 interviews, 50%) were conducted most often. Once the participants mentioned also time-saving for physicians. 21 of these positive aspects got mentioned by the younger 8 patients (< 58 years), 16 by the older (p = 0,5).

As possible challenges of telemedical counseling (Table 4), besides the impression of impersonal counseling (7 of 16 interviews; 43.8%), or the lack of possibilities of physical examination was mentioned (4 of 16 interviews; 25%). One patient described this as follows:

"[...] if I'm ill and I go online with the doctor, he cannot examine me and e.g. look down my throat, etc. [...] Then I can also ask "Dr. Google" in principle. Diagnosing is more difficult for the physician."

Furthermore, other hindering factors could be categorized (Table 4). Besides this "general" problems of telemedicine the neurological patients also reported about concrete situations, where they would prefer a normal contact. Finding the correct diagnosis, psychiatric diseases, emergencies and "complex" diseases have been told here most often.

But also, situations were described by the patients in which telemedical care would be indicated. Most frequently the "discussion of results" has been named (8 of 16 Interviews; 50%), but moreover again emergencies (3 of 16 Interviews; 18.8%) and routine checks for chronic diseases (3 of 16 Interviews; 18.8%) could be collected. Again, very similar situations are described here for completely different questions.

Evaluation portals

Positive (12 text passages; Table 3) and challenging (37 text passages; Table 3) aspects have been collected about online evaluations of physicians.

All in all, we could collect aspects why evaluations aren't helpful in general and why the existing evaluations aren't helpful. The lack of reliability of the portals is denounced in 50% of the interviews. A participant says in addition:

"Because also some people write like being on top of the world, or in the depths of despair."

In addition, the personal impression weighs more than an evaluation (7 of 16 interviews; 43.8%):

"You have to go to the doctor yourself, have the first talk and then see how it works."

Only 12 text passages said something about the benefit of evaluation portals. In 4 of 16 interviews (25 %) it was noted that from the patients' point of view, a reasoned evaluation in the portals can say something about whether there are "good" or "bad" doctors. This also was the most often said argument. Others like giving a first impression about unknown physicians or many similar ratings provide an impression of the physicians counted less.

4. Discussion And Conclusions

The evaluation of guideline-based interviews revealed differentiated answers to the research questions and the benefits and challenges of telemedical structures in physician-patient relationship for neurological patients.

In general, the answers point to two different types of neurological patients. On the one hand a group of patients with a pronounced need for a close physician-patient relationship, on the other hand a group of patients who prefer a certain distance between them and the physician. Telemedicine and telecommunications, with their different elements, offer instruments for both types of patients to meet their different needs. It is important to adjust and apply these possibilities individually to the needs of the patients (Figure 2).

Reminder systems

Arguments for an appointment reminder via text message as well as via call could be collected. Advantages of text messages (E3, E4) supporting the patients' desire for independence. The advantages of a call are in contrast (D4, D6). This confirms the patients' need for a closer physician-patient relationship.

In practice, the question arises as to whether a call or text message is more effective. Previous studies indicated that the kind of reminder system is irrelevant and that it is its presence that generates patient satisfaction [12], so we should stop thinking about the way of reminding. For the first time, we can confirm this for neurological patients, too. For example, the fact, that a reminder won't be forgotten could have been categorized as an advantage for the phone call and the text message either.

Reminder systems can be important in different ways and the therapeutic range can be great. For example a high vaccination rate can be achieved with the help of reminder systems [13]. Especially in relation to the COVID19 pandemic, it's important to ensure broad immunization as quickly as possible and to enable normal social and economic life.

Telemedical care

The patients mentioned advantages of telemedical care (L2; L1) in the course of the demographic change, especially for a sparsely-populated state (such as Mecklenburg-Pomerania), most often.

Also, the possibility of an intense treatment of chronic diseases as an advantage (L7) could have been categorized. At the same time, the acceptance of telemedical care with regard to more complex diseases, including chronic neurological diseases (such as multiple sclerosis or Parkinson's disease), wasn't sufficient everywhere (M3). Although the interviews were conducted with patients who had been diagnosed with these neurological disorders, opinions are divided. This is one of the strengths of this study, as it shows that there is no blanket approval or rejection of telemedical care for this group of patients. Patients, who weren't included in this study, are patients with dementia. Characterizing the needs of this patient group can be a task for future studies.

A further problem in telemedical care for some of the study participants was the treatment of mental illnesses (M6). Reviews show that telemedical psychotherapy can also offer important advantages [14] [15]. In view of the low density of medical specialists [2] such telemedical psychotherapies will be necessary because the risk of chronicity of such diseases if professional help isn't available [16]. Especially for neurological patients these possibilities should be addressed more openly, because patients with neurological disorders like multiple sclerosis [17] or Parkinson's disease [18] are more frequently affected by psychiatric illnesses.

"Emergencies" are named as situations which are suitable and not suitable for telemedical care. This shows, that the right use of telemedicine depends on the patient's needs.

Independent of the basic illness, telemedical procedures would be suitable for example for the pure discussion of findings (N3) or for follow-up-appointments (N1). Therefore, we have to use telemedical care in such situations more often and discuss the possibilities more openly with neurological patients. This study shows for the first time, that there is an openness in neurological patients to this form of therapy.

Former studies show, that there is no deterioration of the physician-patient relationship in patients receiving telemedical care [19][20]. A fact which has to be discussed with neurological patients, because our study shows, that almost 50 % of the interviewees said that telemedical care is too impersonal (M14) and such care lead into a difficult diagnosis (M2) because of a missing physical examination or invasive diagnostics (M16). This supports the thesis, that neurological patients see a chance for telemedical treatment especially for follow-up-appointments.

In summary, in contrast to the reminding service, different types of patients can be identified. On the one hand patients named as advantages, which shows a certain striving for independence (L9, L2). On the other hand, some categories build up a close relationship with the doctor (L10). All this increases the patients' satisfaction with the therapy, which is of decisive importance for the quality of care as well as for health benefits [21]. This study first shows, that for this both types of neurological patients telemedical care can satisfy the individual needs.

Evaluation portals

Patients were asked about the advantages and disadvantages of evaluation portals on the internet. It turned out that for neurological patients the online evaluations don't seem to influence the choice of the physician. The half of the interviews showed, that these portals aren't serious. The "lack of objectivity" is not only a feeling of the patient. In 2018, the German online portal "Jameda" was forced to delete a physician's account after a doctor brought legal action. The use of moderators could intervene to make these portals more trustworthy. This offers the opportunity for the doctor and the practice to improve internal quality management [22]. Support and information for the patients would not only help the patients get a first impression of the physician, but also improve the medical work in order to stand up to the competition. In order to increase the probability that the practice is presented as positive, it is important to know the types of patients described in this paper. A broad orientation of the offer improves the perception

Strengths, outlook and future perspectives

In summary, we can report that clinical experience largely coincides with the results of this study: Neurological patients aren't interested in evaluation portals, there is no preferred way for them of getting reminded on their appointment and they for characterizing can be divided in two groups. Despite their skepticism towards telemedicine, the patients were also able to collect numerous positive arguments for telemedical treatment. For the first time, the needs of neurological outpatients and conclusions for optimizing clinical pathways could have been characterized.

Taking the Covid-19 pandemic into account, digital care is gaining importance. The study shows that neurological patients with their various needs were aware of the opportunities and possibilities of "digital medicine". But not only the on-site visit treatment gets in focus by the pandemic, also the organization of the doctor's practice. Appointments get rarer and waiting time increases. Missing such an appointment can have negative consequences on patient's health. Reminder services can be helpful.

In the future, neurological patients should be encouraged to make use of telemedicine and telecommunications and to establish the necessary infrastructure. However, this study shows that suitable telemedical tools exist for different needs of patients which determine the choice. Central telecommunication structures are health advice and an individual reminder service.

5. Declarations

Ethics approval and consent to participate:

All methods were carried out in accordance with relevant guidelines and regulations.

This study was approved by the regional Ethics Committee of the University of Rostock (No. A 2017-0186).

Informed consent was obtained from all subjects.

Consent for publication

All authors are consent to publish the results

Availability of data and materials

The datasets used for analyzing (the transcribed interviews) during the current study are available from the corresponding author on reasonable request.

The analysed datasets (tables) during this study are included in this published article.

Competing interests

Hamann declares, that there`s no conflict of interests.

Lemke declares, that there`s no conflict of interests.

Kropp declares, that he has received honoraria for training events and advisory councils from Novartis, Lilly, and Teva.

Rimmele declares, that he has received honoraria for lecturing or advisory boards and / or convention support from Novartis and Pharm Allergan.

Jürgens declares, that he has received honoraria for lectures or advisory boards from Allergan, Hormosan, Lilly, Novartis. Sanofi-Aventis and Teva.

Frielitz declares, that there`s no conflict of interests.

Funding

There was no external funding for this study.

Authors' contributions

TH and FF wrote this text and designed the graphics.

SL, TH, TJ and FF designed the interview guide.

All authors read and approved the final manuscript.

Acknowledgments

We thank everyone for participating in the study. Furthermore, we would like to thank Prof. Alexander Storch and the team of the neurological outpatient department at the Rostock University Clinic for making the interviews incorporate into everyday practice.

Authors' details

1 Dept. of Neurology, Headache Center North-East, University Medical Center Rostock, Rostock, Germany

2 Dept. of "Institut für Sozialmedizin und Epidemiologie", University Medical Center Lübeck, Lübeck, Germany

3 Dept. of "Medizinische Psychologie und Soziologie", , Headache Center North-East, University Medical Center Rostock, Rostock, Germany

4 Dept. of "Zentrum für Bevölkerungsmedizin und Versorgungsforschung", University Medical Center Lübeck, Lübeck, Germany

6. References

1. World Health Organization. 2020. Coronavirus disease 2019 (COVID-19): situation report, 72.
2. Swiaczny, Frank. 2014. Demografischer Wandel und Migration in Europa. *Bundeszentrale für politische Bildung*. January 28.
3. Schulz, Anne, and Gabriele Doblhammer. 2012. Aktueller und zukünftiger Krankenbestand von Demenz in Deutschland auf Basis der Routinedaten der AOK. *Versorgungs-Report*. 161–176.
4. Franklin, V. L., A. Waller, C. Pagliari, and S. A. Greene. A randomized controlled trial of Sweet Talk, a text-messaging system to support young people with diabetes. *Diabetic Medicine* 23: 1332–1338. <https://doi.org/10.1111/j.1464-5491.2006.01989.x>.
5. Al Najjar, Sanaa, and Tamer Al Shaer. 2018. Factors affecting adherence to appointment system in the clinic for non-communicable diseases in UNRWA's Khan Younis Health Centre and the role of mobile phone text messages to improve adherence: a descriptive cross-sectional study. *Lancet (London, England)* 391 Suppl 2: S42. [https://doi.org/10.1016/S0140-6736\(18\)30408-2](https://doi.org/10.1016/S0140-6736(18)30408-2).
6. Friedman, Robert H, Lewis E Kazis, Alan Jette, Mary Beth Smith, John Stollerman, Jeanne Torgerson, and Kathleen Carey. 1996. A telecommunications system for monitoring and counseling patients with hypertension: impact on medication adherence and blood pressure control. *American journal of hypertension* 9: 285–292.
7. Hübner, Lisa, and Albrecht Wienke. 2020. Videosprechstunden in Zeiten der Corona-Krise. *Laryngo-Rhino-Otologie*.
8. Hiermansperger, Petra, and Sabine Greindl. 2005. Durchführung qualitativer Interviews und Auswertung. *Am Fallbeispiel: Opportunistisches Verhalten im Ein-und Verkauf von Obst und Gemüse*.
9. Kuckartz, Udo, Thorsten Dresing, Stefan Rädiker, and Claus Stefer. 2008. Qualitative Evaluation in sieben Schritten. *Qualitative Evaluation: Der Einstieg in die Praxis*: 15–57.
10. Mayring, Philipp, and Thomas Fenzl. 2019. *Qualitative Content Analysis Programm*.
11. Mayring, Philipp, and Thomas Fenzl. 2014. Qualitative Inhaltsanalyse. In *Handbuch Methoden der empirischen Sozialforschung*, ed. Nina Baur and Jörg Blasius, 543–556. Wiesbaden: Springer

Fachmedien Wiesbaden.

12. Wegrzyniak, Lauren M., Deborah Hedderly, Kishore Chaudry, and Prashanti Bollu. 2018. Measuring the effectiveness of patient-chosen reminder methods in a private orthodontic practice. *The Angle orthodontist* 88: 314–318. <https://doi.org/10.2319/090517-597.1>.
13. Jacobson Vann, JC, Jacobson, RM, Coyne-Beasley, T, Asafu-Adjei, JK, and PG Szilagyi. 2018. Patient reminder and recall interventions to improve immunization rates. *Cochrane Database of Systematic Reviews*. <https://doi.org/10.1002/14651858.CD003941.pub3>.
14. Golkaramnay, Valiollah, Stephanie Bauer, Severin Haug, Markus Wolf, and Hans Kordy. 2007. The exploration of the effectiveness of group therapy through an Internet chat as aftercare: A controlled naturalistic study. *Psychotherapy and psychosomatics* 76: 219–225.
15. Reiser, Anne. 2013. Zur Effektivität eines optimierten individuellen Nachsorgeprogramms bei Patienten mit psychosomatischen Störungen nach der stationären Rehabilitation.
16. Sonnenmoser, Marion. 2010. Psychotherapie auf dem Land: Telepsychotherapie als neue Option. *Dtsch Arztebl International* 9: [354]–[357].
17. Siegert, RJ, and DA Abernethy. 2005. Depression in multiple sclerosis: a review. *Journal of Neurology, Neurosurgery & Psychiatry* 76: 469–475.
18. Aarsland, Dag, Sven Pålhlagen, Clive G Ballard, Uwe Ehrt, and Per Svenningsson. 2012. Depression in Parkinson disease—epidemiology, mechanisms and management. *Nature Reviews Neurology* 8: 35–47.
19. Hillienhof, Arne. 2012. Telemedizin schädigt Arzt-Patienten-Beziehung nicht. *Dtsch Arztebl International* 109: [3].
20. Kluska, Denise. 2012. *Versorgung aus der Ferne: Die Arzt-Patient-Beziehung unter den Bedingungen der Telemedizin*. Forschung Aktuell.
21. Whitten, Pamela, and Brad Love. 2005. Patient and provider satisfaction with the use of telemedicine: overview and rationale for cautious enthusiasm. *Journal of postgraduate medicine* 51: 294.
22. Krüger-Brand, Heike E. 2010. Arztbewertungsportal: Patientenperspektive ist wertvoll. *Dtsch Arztebl International* 9: [300].

7. Tables

Table 1: Inductive category formation regarding the advantages and disadvantages of a reminder service

Category	Absolute mentions in the interviews; N = 16	Relative mentions in the interviews in %
Benefits		
Avoidable causes of missing the appointment		
B2 The patient forgets the appointment.	8	50
B1 The patient doesn't make a note of the appointment.	1	6.3
Advantages for the patient		
B6 A reminder improves planning for everyday life.	3	18.8
B7 A reminder means that the patient does not have to pay attention to the appointment himself.	2	12.5
B4 After a new appointment has been made, the waiting times are very long.	1	6.3
B8 For the patient, the appointment can be very important.	1	6.3
Unavoidable causes of missing the appointment		
B3 The patient can't keep the appointment due to an illness.	1	6.3
Advantages for the physician's office.		
B5 Reduction of waiting times for the physician's office, because the patients will miss the appointments less.	1	6.3
Challenges		
Not necessary		
C1 The patient says that he/she isn't forgetful	7	43.8
C4 The patient does make a note of the appointment.	7	43.8
C2 The patient uses his/her smartphone for reminding.	1	6.3
C5 The patient only forgets appointments which aren't important.	1	6.3
Not practical		
C6 The patient says that it will annoy him/her.	2	12.5
C7 The patient is very busy.	2	12.5
C8 The patient doesn't check his phone as much as	2	12.5

	necessary.		
C3	It hasn't worked in the past.	1	6.3
	Other reasons		
C9	The patient is afraid of crime.	1	6.3

Table 2: Inductive category formation regarding the advantages of a phone call and a text message

Category	Absolute mentions in the interviews, N = 16	Relative mentions in the interviews in %	
Advantages of a phone call			
D3	The patients don't forget a phone call or a missed phone call.	4	25
D4	A phone call is more personal.	3	18.8
D6	The patient may ask several questions during a phone call.	2	12.5
D1	A phone call is faster than a text message.	1	6.3
Advantages of a text message			
E1	A text message will be read in any case.	4	25
E4	The patient decides when he/she reads the text message.	4	25
E2	A text message doesn't bother the patient.	1	6.3
E3	A text message is faster than a phone call.	2	12.5
E5	The patient knows for sure that the reminder comes from the physician.	1	6.3

Table 3 Inductive category formation regarding the advantages and disadvantages of rating portals

Category	Absolute mentions in the interviews, N = 16	Relative mentions in the interviews in %
Aspects why the existing ratings aren't helpful		
G3 The rating portals aren't reliable.	8	50
G1 The rating portals don't show a unified opinion.	7	43.8
G5 The rating portals don't show trustworthy comments.	3	18.8
G6 The patient is also responsible for the success of the treatment.	1	6.3
Aspects why ratings aren't helpful in general		
G2 The personal impression is more important than reviews.	7	43.8
G4 Personal recommendations are more important than reviews.	3	18.8
G8 The patient doesn't want to look for a new physician.	3	18.8
Aspects making existing ratings more helpful		
H3 Reasoned ratings provide an impression of the physician.	4	25
H2 Many similar ratings provide an impression of the doctor.	2	12.5
Aspects about which ratings make a statement		
H1 Ratings give a first impression of an unknown physician.	3	18.8
H4 Ratings give an overview of the physician's quality.	1	6.3
H5 Ratings give an overview about many aspects.	1	6.3

Table 4: Inductive category formation regarding the advantages and disadvantages of telemedical treatment

Category		Absolute mentions in the interviews, N =	Relative mentions in the interviews in %
Benefits			
Advantages for the patient			
L2	Telemedicine saves time.	7	43.8
L1	Telemedicine is practical for long journeys and patients with low mobility.	8	50
L4	Telemedicine offers intensive and better care.	4	25
L8	Telemedicine enables quick action in emergencies.	3	18.8
L5	Telemedicine is compatible with work.	3	18.8
L7	Telemedicine is practical for chronic illnesses.	2	12.5
L6	Telemedicine offers treatment options that can be varied over time.	1	6.3
L9	Telemedicine is practical for getting a second opinion.	1	6.3
L11	Telemedicine is practical for avoiding full waiting rooms.	1	6.3
Positive aspects for the physician-patient relationship			
L10	Telemedicine is practical for improving the trust between physician and patient.	1	6.3
Advantages for the physician			
L3	Telemedicine saves time.	1	6.3
Situations where the use of telemedicine makes sense			
N3	Discussion of results	8	50
N1	Routine checks for chronic diseases	3	18.8
N5	Planning therapy	2	12.5
N4	Anamnese	1	6.3
Challenges			
Reasons why patients are skeptical about telemedicine			
M7	Telemedicine is too impersonal.	7	43.8
M4	The patients feel better with doctors they know.	3	18.8

M9	Telemedicine depends on technical requirements.	2	12.5
M10	The patients are afraid of deception.	2	12.5
M14	Telemedicine can't inspire trust between doctor and patient.	1	6.3
M12	Telemedicine uses too many technical vocabulary.	1	6.3
Reasons why telemedicine isn't helpful in general			
M16	While using telemedicine there's no possibility for physical examination or invasive diagnostics	4	25
M5	Telemedicine doesn't offer optimal care of the patient.	6	37.5
M8	In personal contact the patient can focus better on his/her illness.	2	12.5
M13	Telemedicine can lead to misunderstandings between physician and patient.	1	6.3
Illnesses and situations in which telemedicine isn't helpful			
M2	Telemedicine isn't helpful for finding the correct diagnosis.	6	37.5
M3	Telemedicine isn't helpful for complex illnesses.	4	25
M6	Telemedicine isn't helpful for psychiatric illnesses.	2	12.5
M11	Telemedicine isn't helpful for acute illnesses.	1	6.3
M15	Telemedicine isn't helpful for palliative illnesses.	1	6.3

Figures

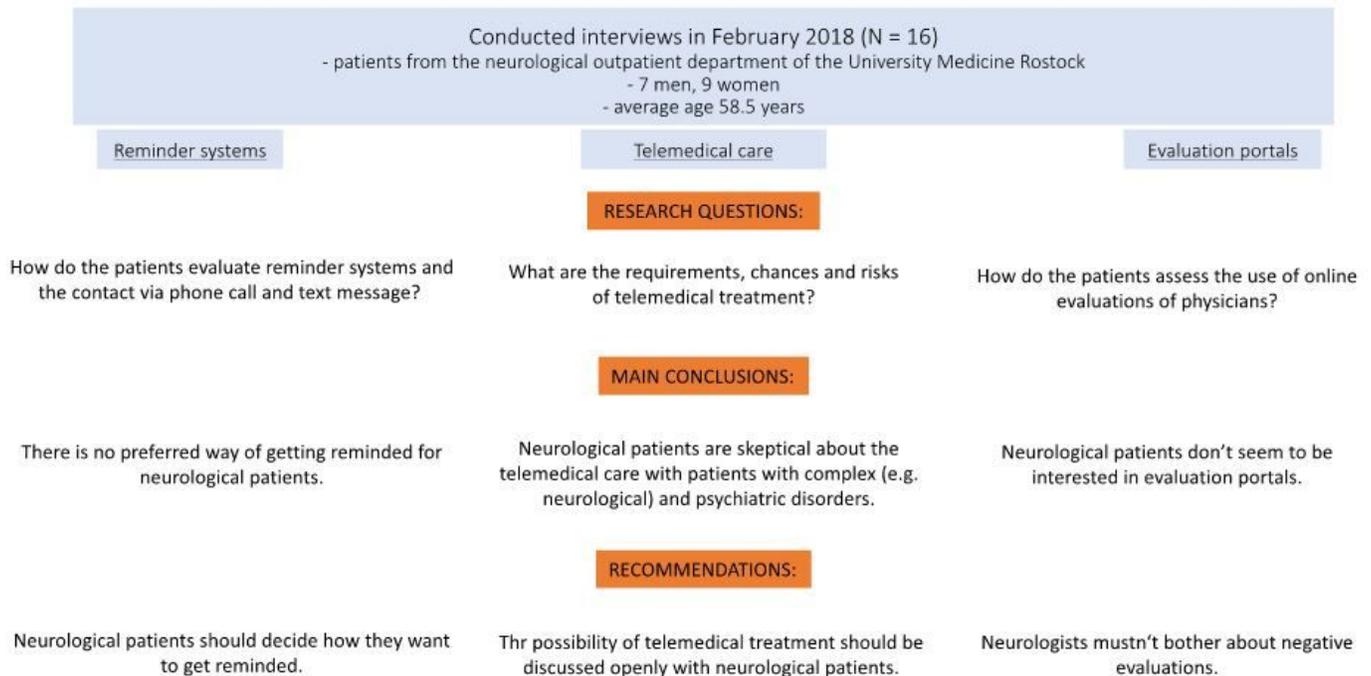


Figure 1

Design and Research Questions.

1. There is no general way of getting reminded for neurological patients.
2. Neurological patients can be divided into patients with a need for a close physician-patient relationship and patients who prefer a certain distance between physician and patient.
3. There are telemedical instruments for both types of patients.
4. Neurological patients are skeptical about the telemedical care with patients with complex (e.g. neurological patients) and psychiatric disorders.
5. Neurological patients aren't interested in evaluation portals.

Figure 2

Conclusions.