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Video consultations in paediatric emergency services: case study on technology use and satisfaction

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This study deals with comprehensive healthcare provision using digital health. A case study is used to investigate the use of video consultations for emergency paediatric care in North Rhine. The use of technology and patient satisfaction are analysed. Recommendations for optimising healthcare are derived from this.

90% satisfied patients and an NPS of 61% demonstrate the great potential of video consultations as the first mean of outpatient healthcare. In addition, a 45% case completion rate, 73% of cases without further use of emergency services and a noticeably faster diagnosis and consultation also give clear evidence for ehealth first solutions.

The premise of ehealth first applies here - patient-centred technologies work regardless of location. There is also interesting potential for video consultations in the fields of geriatrics and geriatric care.

Keywords

ehealth, self-management, service experience, telemedicine, video con-sultation, video-based diagnostics

The Covid-19 pandemic has led to significant disruptions on a health, social and economic level (Alscher et al. 2023). Numerous innovations were introduced in an attempt to contain the manifold consequences of the pandemic. New vaccines have been used, organisational and management models improved and digital innovations introduced (Saw et al. 2021, Smith et al. 2021, Kis et al. 2021). However, the digitalisation initiatives in the healthcare sector have lost momentum. For example, video consultations fell by 40% between 2021 and 2023 (Techniker 2024). One reason for this is a lack of large-scale projects across countries or sectors. This is surprising given that politicians and researchers are clearly calling for the comprehensive digitalisation of healthcare provision for the population (Sachverständigenrat, 2021). This is because digital technologies help to better coordinate care needs and services, reduce diagnostic and treatment errors, shorten hospital stays, facilitate access to care and nursing, optimise health research and improve the important self-management of patients (D'Onofrio, 2022). Patient self-management is an important factor in successful healthcare systems in that it significantly promotes patient autonomy and thus self-efficacy. In turn, the experience of self-efficacy is an important condition for successful healthcare, promotion and prevention (Schmutte et al. 2009, Eller et al. 2018). Accordingly, telemedical technologies that promote self-management and self-efficacy are very promising. Video consultations are one such technology. They not only promote patient self-management, but also increase the frequency of contact with the therapist, facilitate the ability to interact with patients in their own homes, and provide more accurate medical monitoring and improved emergency care (Frielitz et al. 2021).

>> Against this background, the research question is investigated using a single-case study design according to Yin (2014), how video consultations are used as a comprehensive form of care in the healthcare industry and what satisfaction levels they trigger among patients. The project of the North Rhine Association of Statutory Health Insurance Physicians on the introduction of video consultations serves as an empirical basis with the aim of deriving recommendations for action on major digital projects in the healthcare industry for policy and management.

Video consultations as support for self-management

The discussion of optimal relationships between therapists and their patients has a long tradition in health research. In the case of children as patients, there is the particular challenge that the care of the child's well-being is the joint responsibility of the therapist and the parents or guardians (Inthorn and Paul 2017). The concept of shared care for the child's well-being leads to different consequences on a psychological, social, economic and legal level.

From a sociological perspective, shared care leads to communicative negotiation processes between therapists and legal guardians on the one hand and between the legal guardians themselves on the other (Inthorn and Paul 2017). An important aspect of these negotiations is the self-management of patients and their legal guardians. This is often equated with empowerment and aims to develop the knowledge, skills and motivation of patients and their guardians so that they are able to make active contributions to improving their own health or the health of their children (Lorig and Holman 2003). The maintenance and improvement of health is therefore also in the hands of the patients or guardians. This is a challenge insofar as equality between mothers and fathers has not yet been achieved. Care work is largely carried out by mothers, although an increasing number of fathers are signalling their willingness to do so (BM-FSFJ 2021).

Against this backdrop, successful self-management 'manifests itself on both a cognitive and emotional level and encompasses the personal attitude towards [...] health status, the social environment, communication and decision-making processes regarding one's own health as well as the relationship level with the therapist' (Kemper 2019). With regard to the communication and

decision-making processes mentioned, self-management promotes the important autonomy of patients and thus provides resources for individual and collective processes of salutogenesis (Herriger 2002, Entwistle et al. 2010). One resource that has received a lot of attention in the recent past is video consultation technology. These are telemedical interventions that use audiovisual communication technologies to offer mobile, i.e. location-independent and cross-room diagnostics, consultations and monitoring (BMG 2024).

Case study on video consultations in paediatric emergency services

Background to data collection

As part of a pilot project, the North Rhine Association of Statutory Health Insurance Physicians (KV Nordrhein) introduced video consultations in paediatric emergency services in order to relieve the burden on emergency practices and manage patient flows in a targeted manner (KVNO 2023). The aim of the project was to use modern telemedicine solutions to relieve the pressure on emergency service practices by directing less urgent cases to the medically appropriate care structures and thus making care more efficient. This is extremely important given the care density of 9.5 million people in North Rhine, 3.31 million of whom are children. The project was implemented at the end of 2023 in collaboration with the partners samedi GmbH (platform for online appointment allocation and video consultation), adesso SE (project management) and Duria eG (documentation system for the KV emergency service): Commissioning took place on 6 September 2023 - the first video consultation in the paediatric emergency service was carried out on 1 December 2023. The pilot project ended on 31 January 2024 and was scientifically monitored and evaluated by the Health Policy and Strategic Assurance Department of the KV Nordrhein. The pilot project was evaluated comprehensively in two parts: (A) the process evaluation in the context of service provision and (B) the satisfaction and self-efficacy evaluation of a patient survey.

(A) As part of the process evaluation, the feasibility, practical implementation and utilisation of the video consultation were systematically examined. Various data sources were used for this purpose. These included the 'samedi' appointment booking software, the billing data from the Duria practice management system and the reports from the 116117 telephone on-call service. The data obtained was used to descriptively analyse the patient population, the appointments booked and the video consultations actually held. The aim of this evaluation was to obtain a comprehensive picture of how well the implementation of the video consultation works and to what extent it is used by patients.

(B) The satisfaction and self-efficacy evaluation was carried out as part of a patient survey. This was used to assess the perception and outcome of the care process from the patient's perspective. The focus was on measuring patient satisfaction and evaluating the video consultation in terms of the quality of care experienced. The data was collected using a standardised online questionnaire, which was sent to patients after the video consultations. The results of the survey are intended to provide information on the extent to which the video consultation meets the needs of patients and how they evaluate the newly introduced telemedical care.

Utilisation of the video consultation hours

During implementation, there was no significant difference in the gender of the patients (between girls and boys) for whom the video consultation was used. In the age distribution of the children to be treated, the mean value was 3.9 years - with a standard deviation of 3.7 years (see Fig. 1).

A total of 2,261 video consultations were booked during the project phase. Of these, 665 appointments were made online (29.4%). Of the booked appointments, 2,015 were carried out, which corresponds to a realisation rate of 89%. The realised appointments form the population of this study (n = 2015). In addition, there were 236 bookings that were cancelled before the appointment (see Fig. 2).

The video consultations were used nationwide in North Rhine-Westphalia (see Fig. 3). It has been shown that the consultation hours were mainly used in smaller towns and districts. The top three districts were Remscheid, Oberbergischer Kreis and Kreis Kleve - in larger cities such as Essen, Mönchengladbach and the promotion of shared care and equality. The number of confirmed diagnoses totalled 1,635, with the top 5 confirmed diagnoses being fever (18%), respiratory tract infection (14%), conjunctivitis (14%), conjunctivitis (18%), respiratory tract infection (18%) and the number of confirmed diagnoses was 1,635. (14%), conjunctivitis (10%), viral illness (6%) and Previous studies show that mothers make 80-90% of paediatrician visits, while fathers were only involved in 10-20% of cases with vomiting/diarrhoea (5%). In 12% of the diagnoses made, an e-prescription was also issued for patients to take their children to the doctor (BMFSFJ 2021). This is linked to our electronic video consultation, of which almost 50% were written out for eye drops/ointment (with and without antibiotics).

Evaluation results and recommendations

The (A) process evaluation of service provision shows that video consultations are almost equivalent to physical consultations, especially for low-threshold interventions. The average duration of 7.1 minutes for video consultations (standard deviation: 3.4 minutes) is in line with the duration of an average doctor's ap-

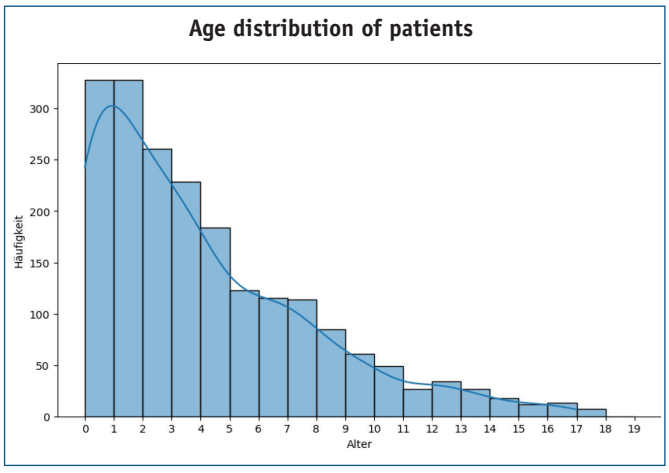


Fig. 1: Age distribution of patients. Own representation.

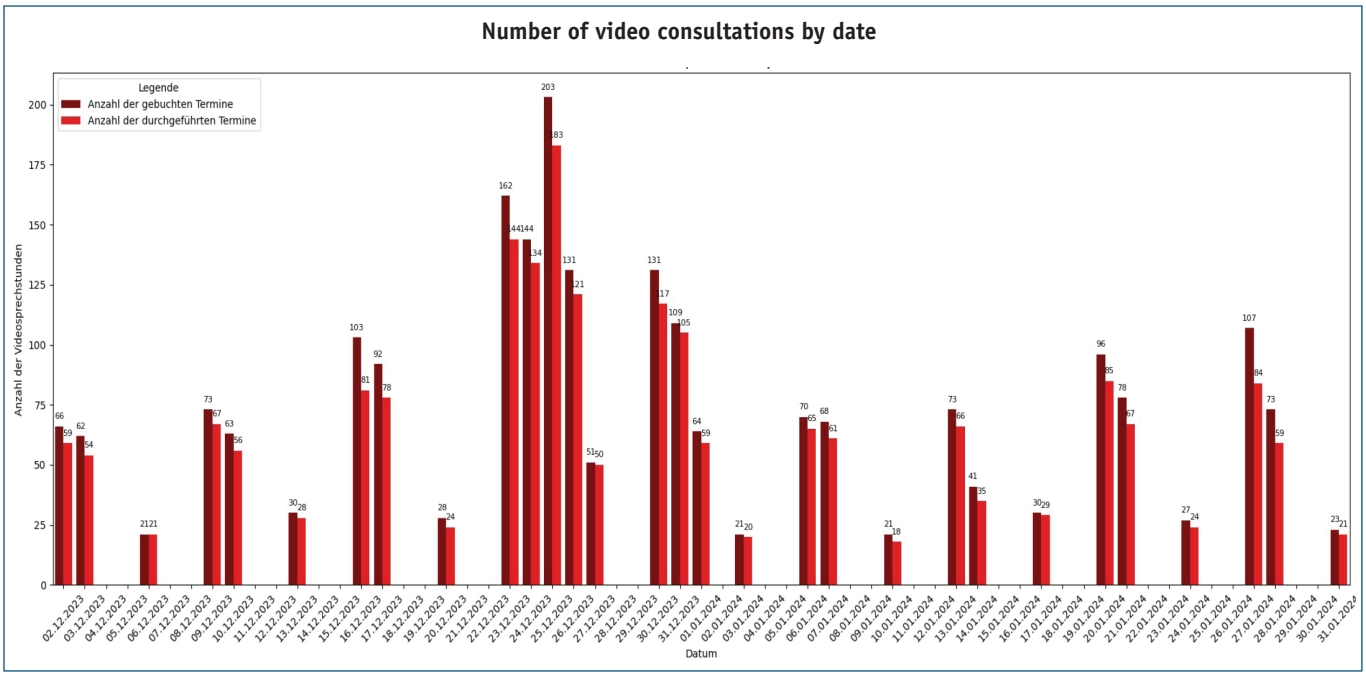


Fig. 2: Number of video consultations by date. Own representation.

pointment, which is 7.6 minutes in Germany (Hanke 2022). These digital technologies also represent a means of relieving the burden on maternal care in the healthcare system and thus the recommendation to expand the range of video technologies in order to achieve more balanced equality in healthcare.

In the (B) patient survey for the satisfaction evaluation, 595 of the 653 survey participants answered the survey in full, which corresponds to 30% of the population and represents a completion rate of 91%. To take part in the consultation hours, 65% of parents/guardians used their smartphone, 10% their tablet and 25% their laptop or PC (with webcam). This shows how important mobile, and therefore flexible, location-independent technologies have become in healthcare. We would like to emphasise that the future of digital healthcare is mobile, combined with the recommendation to plan future digital healthcare projects with the patient-centred premise of 'ehealth first'.

The video consultations that were carried out had a completion rate of 45%. A total of 28% of parents subsequently visited a doctor in private practice for the next possible consultation with a recommendation from the video consultation, 19% consultation, which emphasises the control effect of the intervention. Overall, 73% of the video consultations did not lead to further use of the emergency practice/resources (i.e. 45% completion plus 28% regular doctor's visit). This represents a significant reduction in the pressure on scarce emergency service resources, even if the offer of a low-threshold video consultation can also lead to supply-induced demand. If this relief could also be achieved in the area of out-

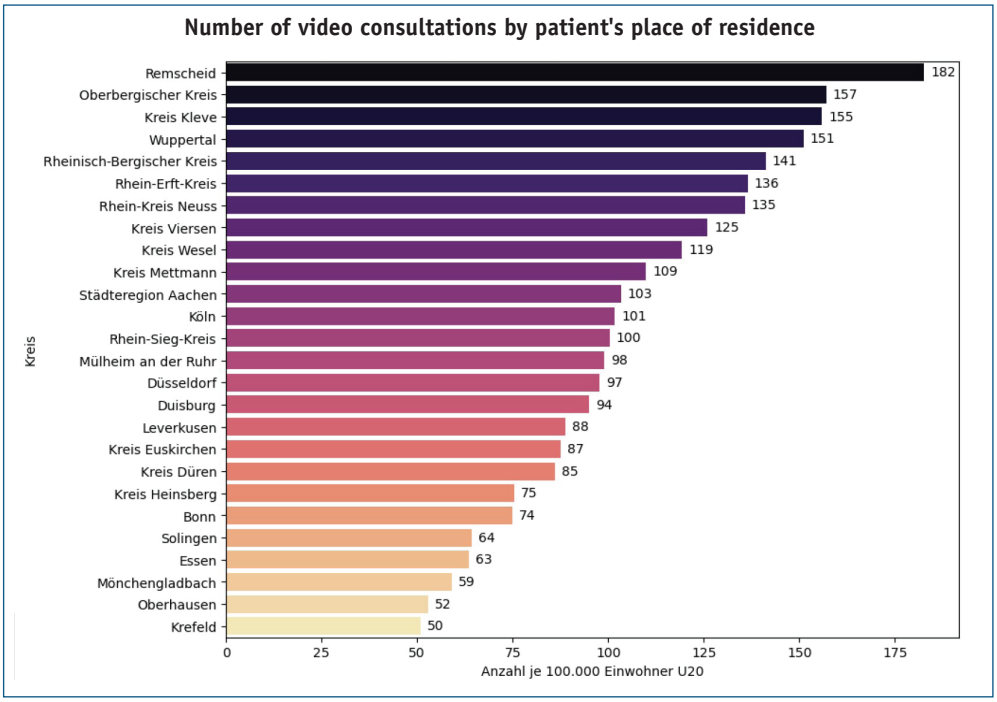


Fig. 3: Number of video consultations by patient's place of residence (U20 and per 100k inhabitants). Own representation.

patient emergency care in clinics and hospitals, significant cost savings and a considerable increase in quality could be realised by concentrating on real emergencies - especially on cost-intensive Sundays and public holidays. We therefore recommend extending video consultation hours to other emergency areas in clinics and hospitals.

We see interesting potential in geriatrics and geriatric care in particular, especially due to the demographic development of society. Further studies could investigate the forms of self-management in these areas and the extent to which video consultations as a telemedical service can also support adults in the healthcare of their parents in geriatric medicine.

Parents' satisfaction with video consultations is high: 86% for consultation quality (vs. 5% neutral and 9% dissatisfied), 88% for platform user-friendliness (vs. 6% neutral and 6% dissatisfied) and 85% for connection quality (vs. 7% neutral and 8% dissatisfied). This result is in line with the satisfaction rate for physical appointments in Germany, which is 91% according to surveys by the National Association of Statutory Health Insurance Physicians. However, it should be noted that in the case of physical consultations, there is still an advantage in trust due to repeated visits, which also influences the perception of treatment quality. The 'Net Promoter Score' (NPS) was used for the general satisfaction measurement, which is a comprehensible and therefore proven measuring instrument and has a high correlation with business success (Reichheld, 2003). A very positive NPS score of +61.7 was determined among the participants in the video consultations (see Fig. 4).

Typical NPS scores in public administration are between 0 and +20, in industry between +30 and +50 and at leading technology companies such as Amazon, Apple or Microsoft at +50 (e.g. Bain 2018), so the score of over 60 can be categorised as very good or excellent.

Digital health - let's start with the parents

This study on nationwide emergency care via video consultations in paediatrics shows a high level of satisfaction among parents and guardians (approx. 90% and NPS approx. 60%) and demonstrates the opportunity for significant improvement and enhancement of outpatient care. A case completion rate of almost half relieves the pressure on the tight emergency service times and rapid implementation during regular doctor's consultation hours. The technology can also help to relieve the burden on maternal care in the healthcare system and promote equality through low-threshold access. It is important to follow the 'ehealth first' premise here - our study results clearly speak in favour of the high importance of mobile technology use on the part of patients and carers.

Although the study is limited to paediatrics, the results show that paediatrics in particular achieves a high quality of care and a very high level of satisfaction among citizens in accordance with the guiding principle 'Let's start with the parents'. This is an important result for politicians, healthcare managers and medical care research.

This was confirmed by the then Federal Minister of Health Prof Dr Karl Lauterbach (2023) in his recommendation for the KV Nordrhein project on the short message service X as follows: 'The video consultation for children, now offered by KV Nordrhein [...], makes a lot of sense. It takes a lot of pressure off the practices. Other KVs should also make use of this.'

However, the study also shows clear potential for expansion to other emergency areas in clinics, practices and similar care facilities. There are particularly interesting potential applications in the field of geriatrics and geriatric care, because the ageing of our society is likely to continue and we see similarities in the care concepts of parents for children and adult children for their parents in order to expand video consultations and improve healthcare in a targeted manner using digital health. <<

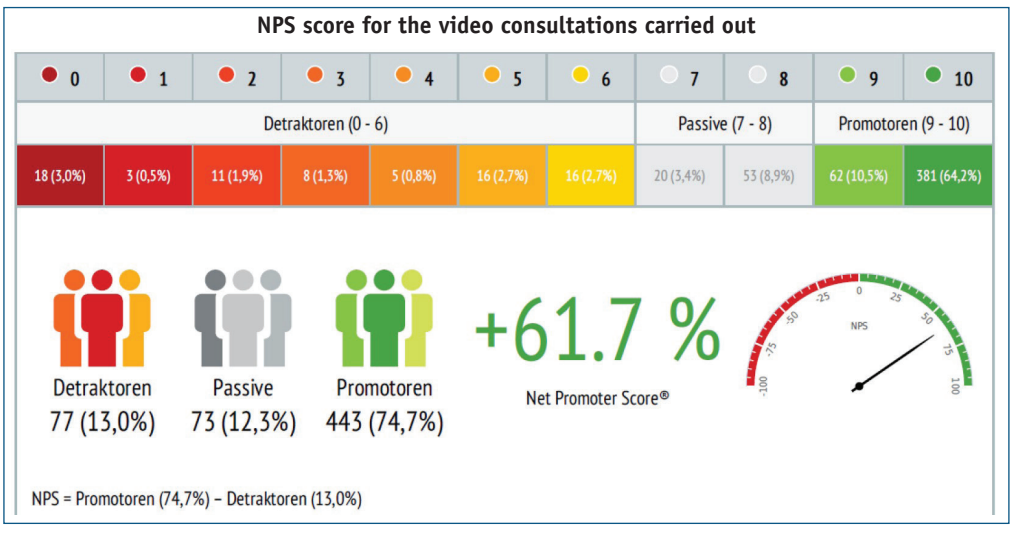


Fig. 4: NPS score for the video consultations conducted. Own illustration.

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Authors' Declaration

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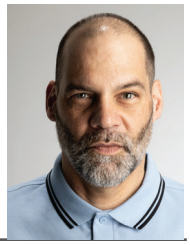
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