THE DOCTOR-PATIENT RELATIONSHIP IN THE ERA OF E-HEALTH

e-Sağlık çağında doktor-hasta ilişkisi

Bahar GRAEFEN[1] ⁱᴰ

Abstract

The doctor-patient relationship is one of the most complex interpersonal relationships in that it involves individuals who are not on the same level, it has not been sought by both individuals, it is emotionally loaded, and it requires close mutual cooperation towards a shared goal. The digital revolution will have a profound impact on how physicians and healthcare delivery organizations interact with patients and the community at large. In the following years, personal contact between patients and doctors will become increasingly rare, and exchanges between consumers and providers will be progressively mediated by electronic devices, from which trust will suffer continually. Unfortunately, this progress has also had a negative impact on physician-patient relations, data protection, and the role of physicians. The main goals of this commentary are to describe the influence of digitalization in the form of eHealth on the doctor-patient relationship. It will be essential that clinicians, managers, policymakers, and researchers gain an increased understanding of this trend so that healthcare systems around the globe can adapt, adopt, and embrace these rapidly evolving digital technologies.

Keywords: e-Health, digital, technology.

Özet

Doktor hasta ilişkisi, aynı seviyede bulunmayan kişileri bir araya getiren, her iki tarafça da aranmamış olan, duygusal açıdan yüklü bulunan ve paylaşılan bir hedefe doğru karşılıklı işbirliği içerisinde hareket edilmesini gerektiren, en karmaşık kişilerarası ilişkilerden biridir. Dijital devrimin, doktorlar ve sağlık hizmeti sunan kurumların, hastalar ve daha büyük ölçekte, toplum ile etkileşim kurma biçimleri üzerinde büyük bir etkisi olacaktır. Önümüzdeki yıllarda, hastalar ve doktorlar arasındaki kişisel ilişki, gittikçe artan oranda azalacak, tüketiciler ile hizmet sağlayıcılar arasındaki alışverişler, artan biçimde elektronik cihazlar yoluyla sağlanacak ve böylelikle güven ilişkisi, sürekli bir şekilde bundan zarar görecektir. Maalesef, bu sürecin aynı zamanda doktor hasta ilişkileri, veri koruması ve doktorların rolü üzerinde de olumsuz bir rolü olmuştur. Bu yorumun temel amacı, e-Sağlık biçimindeki dijitalleşmenin, doktor hasta ilişkisi üzerindeki etkisini açıklamaktır. Klinik uzmanlar, yöneticiler, politika yapıcılar ve araştırmacıların bu trendi daha kapsamlı bir şekilde anlamaları, dünya genelindeki sağlık sistemlerinin hızlı gelişen dijital teknolojilere kendilerini uyarlayıp bunları benimseyebilmeleri açısından kritik öneme sahip olacaktır.

Anahtar kelimeler: e-Sağlık, dijital, teknoloji.

1- Chicago State University, College of Pharmacy. Chicago, USA

Sorumlu Yazar / Corresponding Author: Bahar GRAEFEN
e-posta / e-mail: bahar.graefen@gmail.com

ORCID: Bahar GRAEFEN : 0000-0002-6407-2949

Introduction

Information technology (IT) is increasingly changing worldwide, and this digital revolution profoundly impacts health care (1). Different diagnostics, therapy and prevention areas have become more efficient and comprehensive due to digitization in medicine and modern IT infrastructures such as the Internet (2). In addition, the innovations in this field offer unlimited possibilities for patients to comprehend their health problems and to support personal health care. Video consultations, digital medical records, fully automated imaging, diagnostics, interventions, and treatments are all part of our daily hospital life (2). In addition, it is now easier for patients to find information about their health issues online, meaning they need fewer doctor's recommendations (3). Therefore, doctor-patient communications take place under different conditions.

In the following years, personal contact between patients and doctors will become increasingly rare, and exchanges between consumers and providers will be progressively mediated by electronic devices, from which trust will suffer continually. Unfortunately, this progress has also harmed physician-patient relations, data protection, and the role of physicians (4). Based on this background, I would like to study any effect of these developments in the health system on physician-patient relations and the parties' participation in this relationship. If evidence is found for these theses, it is essential to analyze the elimination methods of these negative aspects. I will use various examples to examine how the construction of the doctor-patient relationship changes on the way to the information society.

Research Question

What influence does digitalization in the form of e-Health have on the doctor-patient relationship?

e-Health

The term eHealth is defined by the Federal Ministry of Health as follows: "E-health includes applications that use the possibilities offered by modern information and communication technologies (ICT) for the treatment and care of patients". E-health refers to the use of digital technologies, such as mobile devices, computers, and the internet, to support health and healthcare services. E-health includes a wide range of applications, such as telemedicine, electronic health records, health information exchange, mobile health (mHealth), and wearable devices, among others. Telemedicine is the use of telecommunication and digital technologies, such as video conferencing, to provide medical care remotely. It allows healthcare providers to diagnose, treat, and monitor patients from a distance, often in real time. Telemedicine can be used for a wide range of medical conditions and services, from primary care and mental health services to specialist consultations and surgical procedures. Telemedicine has become increasingly popular in recent years due to its potential to improve access to healthcare, particularly for people who live in rural or underserved areas, as well as for those who have mobility limitations or transportation barriers. It can also reduce healthcare costs, improve patient outcomes, and increase patient satisfaction by providing convenient, timely, and efficient healthcare services. (5).

Digitalization and health are two inseparable and topical concepts of our modern society. Both areas are at the center of the social transformation process that we are currently going through and bring new new challenges. In recent years, it has become clear that digitalization plays an enormously relevant and permanent role in the health system (6). Willem Einthoven

received electrocardiograms (ECG) over long distances using telemedicine technologies, which were first employed in the early 1900s. (7). Teleradiology was first applied in 1959. It connected two hospitals in Montreal through a television cable to transmit X-ray images (8). In the 1980s, the term telematics was coined, meaning telecommunication and informatics (9). It is a bridging of space and time, which should make data and information available to all actors in the health care system. In the following decade, the new field of telemedicine was developed from telematics with the use of information and communication technologies in medical treatment situations (10). Various telemedicine fields emerged, such as telepathology, -dermatology, -surgery or -cardiology (10). At the turn of the millennium in the new economy era, eHealth was seen as an electronic marketplace for health services through the e-commerce idea. Years later with the onset of the smartphone boom and the emergence of application programs (Apps), mobile health is evolving (11). With the latest developments in artificial intelligence and big data, we are on the way to a new form of digital health.

This has been provided with a legal framework in Germany, consisting of the E-Health Act, the European Union (EU) General Data Protection Regulation and the Digital Care Act (12). The E-Health Act from 1.1.2016 initiated the implementation of digitalization in medicine (13). This was followed in a second step by the EU General Data Protection Regulation of 25.5.2018. Here, data protection was optimized, and the right to data ownership, as well as the right to self-determination, were established. Since this year, legally insured persons have been entitled to "digital health applications" due to the Digital Health Care Act. The law states that doctors may prescribe health apps in a suitable case (14).

The field of e-Health can be clustered into the following forms (15).

Communication - The exchange of information between two participants, i.e. patient to doctor or doctor to doctor, without a direct and timely response from the communication partner, such as in an online diabetes diary.

Interaction - The exchange of information or data between participants with a direct reaction from the communication partner, such as in telesurgery.

Transaction - The targeted exchange of data between different partners, aiming to map and process the provision of medical services entirely electronically, as is envisaged with the electronic patient card.

Integration - Bringing together all data from medical and paramedical areas and supplementing the information with details and inputs from the patient in an electronic health record.

Information - Providing information for patients or doctors via online portals, such as Pubmed or Jameda.

For the research topic discussed here, the levels of communication, interaction and information are crucial. In addition to the classification according to the forms of appearance, depending on the analysis, a level-based classification is preferable. This is classified as below (16, 17):

1. The consumer level: the consumer level includes all offers, such as web-based information portals for patients, apps, measurement and assistance systems or digital fitness tools.

2. The professional level: the professional group comprises the digital offers financed by the traditional actors of the primary healthcare market, i.e. doctors, hospitals or insurance companies. These include, in particular, opportunities from telemedicine, such as IT-supported expert consultations or the remote monitoring of patient's vital signs.

3. The macro level: connects the future digital products and services. The first step in this direction is the introduction of the Electronic Health Card (eGK) in Germany.

4. The artificial level: due to artificial intelligence, machines compete with or

support doctors, especially in the area of diagnosis.

5. Programmable level: Experts are trying to use technology to rewrite human genes and have them installed. Deoxyribonucleic acid (DNA) tests provide essential findings for preventive medicine and allow insights into the basic structure of human beings.

In this classification, this work is to be categorized at the consumer and professional levels.

Doctor-Patient Relationship

In the 360 Degree Study organized by Apobank in 2016 (18). It was determined that more than 60% of physicians believe digitalization has a medium to strong influence on the doctor-patient relationship (18). An important motivation for this assessment by physicians is that patients have easy access to health-related information through the universal Internet. Patients with this background, however, certainly have a higher need for information and professional advice and deviate from what doctors have been used to for decades, causing additional difficulties for the doctors (18). The PraxisBarometer Digitalisation 2020 confirmed that in a good quarter of practices, a noticeable proportion of patients came to the consultation with self-collected health data (19). According to the Bertelsmann Foundation's Health Monitor 2016-2, doctors are divided on whether patients' self-information should be assessed positively or negatively.

Nevertheless, almost one-third of doctors are annoyed about self-information and see the trust in it disputed (20). However, more than half of the doctors support their patients in research and encourage them to do it. The most frequently mentioned sites are Wikipedia, Jameda and the Apotheken-Umschau (20). However, it must be noted that quite a few doctors have a latently paternalistic attitude towards their patients. For a few decades now, a new view of the relationship has been slowly developing- a relationship based on partnership. Here, the doctor's competency in his expertise comes together with the patient's authority about himself and his life. This is developing into a process of shared decision-making.

In routine medical practice, however, there are many limitations, such as the still authoritarian doctor who is often pushed for time, having an average of only 7.6 minutes per patient, and the patient's fear of being perceived as "difficult" (21). In the Nuance study of 2015, in which more than 3,000 patients in the USA, Great Britain and Germany were surveyed, approximately 50% of the patients named the following main points for a positive evaluation of the doctor-patient relationship: privacy, verbal communication and eye contact (22). Handshakes, physical contact, and physical presence were also secondary factors (23). This shows that professional competence is not critical, but interpersonal social factors and privacy have a very high impact. However, this advantage of doctors can only be maintained in the future if doctors are seriously concerned about the pre-informed and participating patient. Topics that mainly concern these patients and about which they acquire prior knowledge are therapies, disease symptoms, illnesses, health insurance benefits, diagnostics, the quality of hospitals, additional medical services, advice for a healthy lifestyle, prevention, early detection, and the case-related prognosis. In addition to these topics, however, the relationship between doctors and patients essentially comes down to communication. Through communication, doctors and patients get to know each other and develop a shared understanding of health and possible therapeutic goals and measures. People's communicative actions and sense-making are increasingly involved with digital media. "Dr Google will soon replace the family doctor," predicts the newspaper Die Welt (24). Through communication, doctors and patients form an image of their counterparts. They get to know their relationship partner communicatively: "We can only determine what another's identity is

within the framework of communication with another" In this communicative process of getting to know each other, the doctor and patient present and experience each other as bearers of social roles and individuals.

This typology of the doctor-patient relationship can be divided into four types of clusters (25). Historically, the relationship was more paternalistic. This means the doctor leads the conversation while the

	Guided by doctor		
		low	high
Guided by patient	low	Indifference	Paternalism
	high	Consumerism	Partnership

Figure 1: The typology of the doctor-patient relationship (38).

patient follows in the discussion (26). The doctor asks questions, sets the topics of conversation, and makes treatment decisions. Here, a dominant doctor meets a submissive and obedient patient. This relationship type is opposed to the consumerist relationship based on the patient's service expectation (27). The conversation is characterized by a high level of engagement and authority on the part of the patient and, at the same time, by the doctor's limited ability to exert influence. In the partnership relationship, the doctor and patient communicate on an egalitarian level. Both have great freedom and make decisions in cooperation. In a relationship characterized by indifference, neither the doctor nor the patient shows any commitment. Sometimes this results in the doctor and patient breaking off contact or conflicts arise. A partnership-based relationship, in particular, helps mitigate the developments in digitalization and the resulting challenges to the relationship of trust. Especially in the age of digitalization and the spatial decoupling of doctor and patient, the story of a long-term mutual relationship of trust is of great importance. Also, given the increase in self-diagnosis through internet research, the

relationship of trust between doctor and patient is significant. Information from the Internet can be a basis for mistrust and lead to questioning the therapy the doctor suggests. Online evaluations are also rapidly gaining importance. Here, the quality of the relationship between the patient and doctor has a decisive influence on how much the patient trusts the doctor and is also willing to communicate information and feedback directly and not to express his displeasure indirectly and mainly anonymously via evaluation portals (28).

But e-health also offers many advantages for the doctor-patient relationship (29). Patients already have a specific basic understanding since they have low-threshold access to health-related information through online media (30). The knowledge patients acquire through internet research allows them to participate in doctor-patient conversations with questions and suggestions actively. Some patient questions refer to the doctor's therapy instructions and recommendations. Some patient questions refer to the doctor's therapy instructions and recommendations. Some are questions of understanding or intervening that concern the doctor's instructions for action, such as questions about possible alternative

treatments. Patients who have acquired health-related knowledge also express more worries to the doctor. Internet-informed patients also sometimes come to the consultation with prepared lists of questions. The doctor can provide the patient with information and offer support in evaluating and classifying the knowledge they have acquired online. This can lead to the patient's active participation in treatment decisions within the doctor-patient discussion; moreover, online research and the exchange with other patients in forums and social networks often strengthen the patient's trust in the doctor since the information coincides with the doctor's recommendations. However, the patient should always be aware that the Internet does not replace the visit to the doctor but only complements it.

Of course, there are also disadvantages for patients. For example, some doctors assume that online information is useless to the patient or even harms him. Therefore, they try to reject and negate the knowledge acquired by patients on the Internet. It is also often difficult for open doctors to identify the origin of the knowledge and correct it, for example, concerning trustworthy websites if necessary.

But in some cases, the doctor must correct incorrect online knowledge. This is especially true when patients research the medication online and decide not to take it despite the doctor's prescription. This is especially true for psychotropic drugs. This puts a noticeable strain on the doctor-patient relationship. In some cases, it even leads to online self-diagnosis (31). This can be very dangerous, for example, in the case of cancer.

Of course, other dangers are associated with e-health, especially regarding data security and protection. This creates a particular "innovation caution" among the population, which can be reduced through extensive and, above all, understandable communication (32). Furthermore, conscientious handling of patient data is a prerequisite for building acceptance. It must be ensured that the patient has the upper hand over his data and does not lose it. In addition, it requires a non-negligible effort, both in terms of personnel (e.g., in the form of training) and financially, to secure the devices and networks of a practice professionally and to use them following the rules in order not to shake the trust in the course and thus in the doctor-patient relationship.

The COVID-19 pandemic has dramatically impacted the utilization of e-health technology in general practices. However, it is unclear which specific e-health applications have seen the most significant changes, whether this increase in usage is temporary or permanent, and if there is variation in adoption depending on the type of e-health technology and type of general practice. For example, in Catalonia, Spain, 70% of consultations that previously took place in person were conducted online due to the pandemic. Similarly, there was a significant increase in teleconsultations in Germany, with growth rates exceeding 1000% (33). Low- and middle-income countries like India also saw a rise in e-health use. Still, uptake may be more difficult in these countries due to lower investments and limited internet connections (34, 35). Physicians report that telemedicine visits offer new opportunities to improve patient care but also note changes to their interactions with patients, which may have positive and negative effects on provider-patient communication, patient willingness to disclose concerns, and, ultimately, patient health outcomes (36).

Conclusion

In conclusion, however, it can be said that the doctor is still the the most critical contact person for most patients regarding "health and illness". Thus, it can be noted that although the trustworthiness of the Internet has grown in recent years, the doctor is still considered the most trustworthy source of health-related information for most patients. Face-to-face conversation with the doctor is also the preferred source of information for most patients. However, the doctor-patient conversation will increasingly become a partnership and a young generation of digital natives on the doctor's side will use the multitude of e-health tools and strengthen the relationship with the patient based on the new possibilities (37).

References

1. Gopal G, Suter-Crazzolara C, Toldo L, Eberhardt W. Digital transformation in healthcare – architectures of present and future information technologies. Clinical Chemistry and Laboratory Medicine (CCLM). 2019;57(3):328-35.

2. Eysenbach G. What is E-Health? J Med Internet Res. 2001;3(2):e20. DOI:10.2196/jmir.3.2.e20.

3. Tonsaker T, Bartlett G, Trpkov C. Health information on the Internet: gold mine or minefield? Can Fam Physician. 2014;60(5):407-8.

4. Murray E, Lo B, Pollack L, et al. The Impact of Health Information on the Internet on the Physician-Patient Relationship: Patient Perceptions. Arch Intern Med. 2003;163(14):1727–34. DOI:10.1001/archinte.163.14.1727.

5. Bundesministerium für Gesundheit. Definition von E-Health. [Internet]. [cited 2023 Apr 19]. Available from: https://www.bundesgesundheitsministerium.de/service/begriffe-von-a-z/e/e-health.html

6. Schachinger A. Der digitale Patient. Analyse eines neuen Phänomens der partizipativen Vernetzung und Kollaboration von Patienten im Internet. 1st ed. 2014. ISBN print: 978-3-8487-0961-8, ISBN online: 978-3-8452-5096-0. https://doi.org/10.5771/9783845250960.

7. Lovejoy JF, Read M. History, and evolution of telemedicine. In: Telemedicine in Orthopedic Surgery and Sports Medicine: Development and Implementation in Practice. 1st ed. 2021. p. 3-10.

8. Monteiro AMV, Lima CMAO, Santos AAS. Global Teleradiology services and education: Brazilian projects to improve service and education. In: Feijó RA, Ziviani, Blanco PJ. Scientific Computting Applied to Medicine and Healthcare. Current State and Future Trends at the INCT-MACC the Brazilian National Institute of Science and Technology in Medicine Assisted by Scientific Computing. Petropólis, RJ: LNCC/MCTI; 2012. p. 373-390.

9. Mjøs OJ, Moe H, Sundet VS. The functions of buzzwords: A comparison of 'Web 2.0'and 'telematics'. First Monday. 2014;19(4).

10. Wootton R, Craig J, Patterson V. Introduction to telemedicine. CRC Press; 2017.

11. World Health Organization. mHealth: New Horizons for health through mobile technologies. Geneva; 2011:6.

12. Cirillo F. The Impact of e-Health on Privacy and Fundamental Rights: From Confidentiality to Data Protection Regulation. Eur J Privacy L & Tech. 2019;95.

13. Martenstein I, Wienke A. Aktuelle Gesetzgebung im Gesundheitswesen 2015/2016. Der Pneumologe. 2016; 13(3):203-8.

14. Loubichi S. General data protection regulation (GDPR) of the European Union. What had to be considered until 25 May 2018. Atw Internationale Zeitschrift fuer Kernenergie. 2018;63(5):289-94.

15. Klein M. Definition-Was ist eHealth? In: eGovernment Computing [Internet]. Jan 2017. [cited 2023 Apr 19]. Available from: https://www.egovernment-computing.de/was-ist-ehealth-a-570980/

16. Peters T, Klenke B. eHealth und mHealth in der Gesundheitsförderung. In: Ghadiri A, Ternès A, Peters T (eds) Trends im Betrieblichen Gesundheitsmanagement. Springer Gabler, Wiesbaden; 2016. p. 123-33.

17. Evsan I, Wunderlich A. Eine Übersicht zum Thema E-Health und Digital Health [Internet]. [cited 2023 Apr 19]. Available from: https://ehealthblog.de/ehealth/

18. apoView II/2016: 360-Grad-Studie zur Digitalisierung im Gesundheitsmarkt [Internet]. May 2016 [cited 2023 Apr 19]. Available from: https://newsroom.apobank.de/documents/apoview-ii-strich-2016-360-grad-studie-zur-digitalisierung-im-gesundheitsmarkt-69465

19. Albrecht M, Sander M, Temizdemir E, Otten M. PraxisBarometer Digitalisierung

2020.

20. Bittner A. Gesundheitsmonitor - Informierte Patienten und unzureichend vorbereitete Ärzte [Internet]. 2016 [cited 2023 Apr 19]. Available from: https://www.bertelsmannstiftung.de/filea dmin/files/BSt/Publikationen/GrauePubli kationen/GeMo-NL_2016-2_VV.pdf

21. Irving G, Neves AL, Dambha-Miller H, Oishi A, Tagashira H, Verho A, et al. International variations in primary care physician consultation time: a systematic review of 67 countries. BMJ Open. 2017;7:e017902. DOI: 10.1136/ bmjopen-2017-017902. PubMed PMID: 28928173.

22. Doctor F, Karyotis C, Iqbal R, James A. An intelligent framework for emotion aware e-healthcare support systems. In: 2016 IEEE Symposium Series on Computational Intelligence (SSCI). IEEE; 2016. p. 1-8.

23. Nuance/HIMSS Europe. Following the time thieves in hospitals: the real burden of documentation in German acute care hospitals is underestimated [Internet]. HIMSS Europe; 2015 [cited 2023 Apr 19]. Available from: https://www.dragon-spea-king.de/download/HIMSS-Europe-Studie.pdf?m=1434964003&

24. Van Husen G. Dr. Google will soon replace the family doctor [Internet]. Die Welt. 2017 May 18 [cited 2023 Apr 19]. Available from: https://www.welt.de/ wirtschaft/bilanz/article164689392/Dr-G oogle-wird-bald-den-Hausarzt-ersetzen. html

25. Shutzberg M. The doctor as parent, partner, provider… or comrade? Distribution of power in past and present models of the doctor–patient relationship. Health Care Analysis. 2021 Sep;29(3):231-48.

26. Peck BM, Conner S. Talking with me or talking at me? The impact of status characteristics on doctor-patient interaction. Sociological Perspectives. 2011;54(4):547-67.

27. Siegrist J. The changing role of physicians. Bundesgesundheitsblatt. 2012;55:1100-1105. DOI: 10.1007/ s00103-012-1527-y.

28. Katz J. The silent world of doctor and patient. Baltimore: Johns Hopkins University Press; 2002.

29. Barbosa C, Pereira AD. E-health and the doctor-patient relationship: remote healthcare: consent and data protection-challenges of a new paradigm. E-health and the doctor-patient relationship: remote healthcare: consent and data protection-challenges of a new paradigm. 2021:89-113.

30. Robinson E. E-health and the Internet: Factors that Influence Doctors' Mediation Behaviors with Patients. 2008.

31. Ćirković A. Evaluation of Four Artificial Intelligence–Assisted Self-Diagnosis Apps on Three Diagnoses: Two-Year Follow-Up Study. J Med Internet Res. 2020;22(12):e18097. DOI: 10.2196/ 18097.

32. Schäfer K. E-Health – die Digitalisierung des Gesundheitswesens [Internet]. Devicemed. 2019 Dec 2 [cited 2023 Apr 19]. Available from: https://www. devicemed.de/e-health-die-di-gitalisieru ng-des-gesundheitswesens-a-888162/

33. Friends of Europe. A Highly Desirable Revolution in Digital Health [Internet]. Friends of Europe. [cited 2023 Apr 19]. Available from: https://www. friendsofeurope.org/insights/a-highly-de sirable-revolution-in-digital-health/

34. Garg S, Gangadharan N, Bhatnagar N, Singh M, Raina S, Galwankar S. Telemedicine: Embracing virtual care during COVID-19 pandemic. J Fam Med Prim Care. 2020;9(9):4516–20. doi: 10.4103/jfmpc.jfmpc_1118_20. PMID: 33154231; PMCID: PMC7657802.

35. Bhaskar S, Bradley S, Chattu VK, Adisesh A, Nurtazina A, Kyrykbayeva S, et al. Telemedicine Across the Globe-Position Paper From the COVID-19 Pandemic Health System Resilience PROGRAM (REPROGRAM) International Consortium (Part 1). Front Public Health. 2020 Oct 29;8:556720. doi: 10.3389/fpubh.2020.556720. PMID: 33195347; PMCID: PMC7646014.

36. Gomez T, Anaya YB, Shih JA, Frankel RM, American Board of Family Medicine. A qualitative study of primary care physicians' experiences with

telemedicine during COVID-19. *J Am Board Fam Med. 2021 Jul-Aug;34(Supplement):S61–S70. doi: 10.3122/jabfm.2021.S1.210101. PMID: 34244751.*

37. *Schachinger A. Digitalisierungsreport 2019 - Studie im Auftrag von DAK-Gesundheit und Ärzte Zeitung [Internet]. DAK-Gesundheit. 2019 [cited 2023 Apr 19]. Available from: https://www.dak.de/dak/download/digitali sierungsreport-2019-ergebnisse-222022 2.pdf*

38. *Schachinger A. Digitalisierungsreport 2019 - Studie im Auftrag von DAK-Gesundheit und Ärzte Zeitung [Internet]. DAK-Gesundheit. 2019 [cited 2023 Apr 19]. Available from: https://www.dak.de/dak/download/digitali sierungsreport-2019-ergebnisse-222022 2.pdf*

39. *Meinzer D. Einleitung. In: Die Arzt Patient Beziehung in einer digitalisierten Welt. Medien • Kultur • Kommunikation. Springer VS; 2019. p. 1–8.*