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Building Digital Bridges: Exploring the Digitized Collaboration of General Practitioners and Mobile Care in Rural Areas

Completed Research

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Abstract

In the process of digitalization of healthcare, professionals, such as mobile care nurses or general practitioners, are facing both new challenges and opportunities. Digital technologies thereby promise to affect the cooperation of healthcare professionals on various levels, e.g., increasing quality of care, improving interprofessional communication, or optimizing economic aspects of care. Our study examines current issues of healthcare professionals concerning a digital change of care. We conducted qualitative interviews with primary care practitioners and providers of mobile care (nurses and care managers) to understand perceived obstacles in the process of digitalization and to formulate possible implications to encounter those obstacles. Our results suggest that insufficient communication and a lack of mutual trust have to be considered relevant issues. We therefore propose to focus future research on the interchangeability of different communication and documentation systems.

Keywords

Qualitative Study, Digitalization, General Practitioners, Mobile Care, Communication.

Introduction

In times of demographic change and the lack of qualified healthcare workers, the healthcare system faces significant challenges that largely affect rural areas. The deficit in the number of practicing general practitioners (GPs) and the rising average age of the general practitioner population is one factor. Other factors, such as the rural exodus of GPs and the desire for flexible working models, exacerbate this problem (overtime, lack of successors). In rural areas, there are some environmental and infrastructural differences compared to urban regions. Both mobile care and general practitioners in rural areas are forced to travel long distances to visit a practice or patients and therefore have a geographical disadvantage (Currie et al. 2015). The existing shortage becomes particularly evident when looking at mobile care. The mobile care services in the countryside are already working above their limit, and additional nursing offers are missing. Part of the necessity for considering ambulatory healthcare is that, especially in rural areas, many elderly patients want or have to live at home, but this is not feasible without nursing services and home visits by their general practitioners. Hence, structures urgently need to be created to make the work more accessible and more efficient. Hence, in order to shed light on prevalent structures, processes, and occurring challenges, it is necessary to investigate how these two important actors work together. The interaction between GPs and mobile care is an essential part of working and patient-centered care.

Another part is how digital technologies can be used to address these issues. Technologies come with advantages and beneficial promises but also with challenges. Digitalization and innovative tools have a meaningful impact on different areas of life. Thus technological advances promise significant progress for patient treatment processes and healthcare in general. But there is a long way to go for digital health to reach this potential (Kreps 2014). The digitalization of rural medical care (which we define as professional treatment of patients and diseases) processes and the associated integration of innovative digital technologies are possible solutions to maintain and potentially improve population-wide care. The possibility of data transfer over long distances might help to affect the shortage of care related to spatial and temporal obstacles. Digital technologies also influence the relationship between health actors. In everyday life, technologies such as a smartphone and messengers are used for communication. However, this is not yet established in the healthcare sector and personal conversation is preferred in many cases, among others due to unsolved security aspects. Here, digital innovations can empower general practitioners and nurses to manage treatments and work processes more efficiently in the face of high demand. Especially in the care sector, efficiency requires nurses to deal with new technologies, like the use of smartphones (Wyatt and Krauskopf 2012). Healthcare professionals are confronted with a plethora of available technologies. It is difficult to assess, which are the essential factors in treatment (Jimison et al. 2008). First conducted studies have shown that this issue represents a significant challenge in rural healthcare (Warburton et al. 2014). A higher level of participation and advice from external sources for digitalization is needed (Niehaves and Plattfaut 2014).

Research lacks dedicated studies that investigate the interplay of general practitioners and mobile care and how collaborative processes can be digitally enhanced, facing prevalent challenges in comprehensive healthcare delivery. The paper at hand seeks to fill this research gap by investigating the cooperation of general practitioners and mobile care to bridge rural care deficits. It examines the attitudes towards digital technologies and how the view of mobile care is in contrast to that of general practitioners. Hence, the paper contributes to our understanding of the structures involving general practitioners and mobile care units in rural areas, occurring challenges and deficits, and how these issues can be digitally enhanced to achieve satisfactory and efficient processes. Our study is guided by the following research questions:

RQ1: Which problems occur in the process of cooperation between nurses in mobile care and general practitioners in rural areas?

RQ2: How can digital technologies solve identified problems?

Theoretical Background

The Challenges of General Practitioners and Mobile Care

Observations of the statistical figures in Germany show that the number of general practitioners in rural areas seems to be halved in the next few years. According to statistical data from the German Medical Association, the average age of GPs in Germany is 55.3 years and 15.1% have already reached retirement age (Munz 2018). As a result, they will retire in the next few years and will cause a decline in the comprehensive care supply. Rural areas lack the availability of short-term accessible healthcare services, among other things, due to inequitable urban-rural distribution, especially when looking at specialized general practitioners (Johnson, Brems, Warner and Roberts, 2006). These issues root in characteristics of rural areas such as low attractiveness for young medical graduates opposed to urban areas (Rosenblatt and Hart, 2000; Yang, 2003), thus creating spatial disadvantages (Wilson et al., 2009). Patients often complain about difficulties in getting instant help in case of severe health issues that demand a specialist or intensive, ad-hoc care. In many cases, patients need to travel long distances to consult a specialist (Johnson et al., 2006; Currie et al., 2015). This development is increasingly forcing general practitioners and specialists to face the most significant challenges (e.g., shortage of specialists, rising patient numbers due to demographic change, or urban-rural disparities) in the health care system. Other key elements of the healthcare system, such as mobile and geriatric care, face very similar problems. Nevertheless, research lacks studies looking at digitization potentials and requirements within mobile care. Looking at the healthcare sector, it seems that the digitalization is far behind other sectors (Reddy and Sharma 2016). In 2017 DESTATIS published a report showing that there is a mismatch between patients and mobile care in Germany (Destatis 2018). This calls for a scientific perspective on the role and potentials of digitalization for mobile care services.

However, in order to ensure comprehensive care in rural areas, the specifications of the rural area in Germany must also be considered. In rural areas, there are some environmental and infrastructural differences compared to larger cities. Mobile care and practitioners in rural areas are forced to travel long distances for a visit and therefore have a geographical disadvantage (Currie et al. 2015). In addition to the practitioners-care relationship, the acceptance of patients is also decisive with regard to the use of digital, mobile care. The advantages of structurally stronger regions, such as the quality of training and education (Yang 2003) or an improved work-life balance (Thommasen et al. 2001), encourage GPs to establish a business. As a result, inequalities in access to healthcare and in the health status of the population as a whole arise (Politzer et al. 2001). Interactions also play a role here, as the investigation of perspectives of GPs concerning the digitalization of treatments and the effects of patient empowerment showed that patient activity, the effects on the treatment process, patient differentiation and patient-practitioner interaction are relevant factors for the evaluation and willingness of practitioners to use health technologies (Mueller et al. 2020). Technologies can potentially bridge this disparity by providing virtual access to care and deploying digital ways to communicate. However, the necessary networks and infrastructures usually appear to be deficient in rural areas. This is the reason why solutions must be found urgently.

Digital Technologies in Healthcare

In the health sector, the efficient application of digital technology is a crucial issue and a growing challenge. The critical competency areas identified from a healthcare perspective concerning digitalization include knowledge of digital tools and their use required for excellent patient care, including the related social and communication skills (Konttila et al. 2019). Many studies have shown that there have been problems in communication on the part of the practitioner (Starfield et al. 1981; Stewart et al. 1979). Many of these studies focus on the practitioner-patient relationship (Levinson et al. 1993; Lu and Zhang 2019; Seiler et al. 2017). Misunderstandings in communication have a substantial impact on patient care (Sampson et al. 2016). Many digital technologies have been brought to the market, and the decision to use individual systems is often not easy for health professionals. Patients, in particular, want more digital communication, as there is a gap between patients' interest in online communication and what GPs can currently offer (Lee et al. 2016). In all these considerations, it is necessary to consider the views and needs of GPs and health care professionals. However, one study describes the use of smartphones by nurses in acute care. It showed potential for improvement in patient care, with the smartphone serving as a useful tool for communication between nurses and other health care actors (Farrell 2016). The concerns of digitalization among GPs are also reflected in other scientific studies. GPs were rather pessimistic about technology, especially concerning patient portals and expected changes that could negatively influence their workflows. An excellent example of how digital health can work is shown in Denmark. The country has developed a strategic plan for a coherent and trustworthy health network (e.g., by implementing a structured electronic voice platform), with the needs of patients at the forefront of the strategic plan (Mesko and Györfy 2019).

Methods

Case Description and Study Design

We conducted a qualitative study within a regional governmental project dealing with the digitalization of care, its processes, and treatment paths. Due to its rural location, the involved city administration is particularly interested in improving medical care and in counteracting the future lack of personnel through digital structures. Through initial discussions with regional practitioners, it has become clear that poor communication between professional actors is a significant burden and could be improved with the help of digital structures. The communication problems in rural areas from the viewpoint of GPs comparison to the viewpoint of mobile care were examined within the framework of this study. We conducted semi-structured interviews to identify the main problems regarding communication and its digitalization, looking at each group of stakeholders (general practitioners and mobile care) individually and in comparison. Overall, the superordinate project earmarks to interview general practitioners, patients, nurses, and pharmacy staff to establish a holistic picture of the state of rural healthcare. We interviewed nurses and heads of care within two mobile care facilities. To do so, we engaged two expert groups applying a focus group workshop design. The first group involved two nurses and one head of care. The second group involved three nurses and a management employee. One reason for the focus group was that the executives of the respective institution wanted to be involved in the discussion. We have evaluated the target-oriented

statements from both the nurses and the management. It is also clear that peoples' views complemented each other. We believe that many statements would not have been made without the group discussion.

Data Collection and Analysis

Overall, we conducted nine semi-structured interviews, including two workshops, with seven general practitioners and seven mobile care employees (five nurses and two managers). The average duration of the interviews amounted to 60 minutes (ranging from 50 to 80 minutes), and they were conducted on the respective institutional site. The interviewed GPs were aged between 41 to 66 years (52 years on average) and had a professional job experience between 15 to 35 years (25 years on average). The gender distribution was three females and four males. The participants from mobile care with an age of 35 to 64 years (49 years on average) and professional job experience between 17 to 32 years (22 years on average). The gender distribution was four females and three males. The used interview guideline was divided into five sections. The first section was devoted to personal questions, such as age and work experience. The second section was about previous general experiences with digital technologies and the status quo. Here, questions about previous experiences and information about digital solutions were important. In the third section, the communication paths across the different actors were explicitly queried. In the fourth section, the probands were presented a technical scenario in which a hypothetical procedure with a video conferencing system would be presented. In addition, the system can record and evaluate the patients' data using sensors and algorithms and gives, if it is a necessary treatment, a signal. Here, the acceptance and suitability for everyday use was questioned. In the fifth section, general questions were asked about individual desires regarding digitization and where the participants see themselves and their professional field in ten years. This paper focuses on digital technology and the improvement of the relationship between GPs and mobile care. The patient perspectives or those of other health actors are not in this paper. The interview guideline was not changed throughout the interviews. The actual data analysis was carried out after the last interview (ex-post data analysis). The interviews were conducted in German, audio-recorded, transcribed non-verbatim, and translated into English. To code the interview data, we used the software MAXQDA.

We followed a thematic approach for analysis, examining the data for common and recurring themes, ideas, and patterns of meaning (Boyatzis 1998; Braun and Clarke 2012). An inductive approach was chosen to allow the emergence of different themes and their iterative reflection with regard to the underlying empirical data. Our data analysis procedure consisted of six steps proposed by Braun and Clarke (2012): (1) We familiarized ourselves with the data by screening the transcripts and written notes taken during the interviews as well as listening to the audio recordings once more. (2) Next, we formed low-level, open codes and assigned them to the respective interview passages and statements. This led to the formulation of 19 codes in total. (3) In the third step, identified codes were merged into themes, while each theme addressed a common topic and meaning. (4) We reviewed the data again, looking for additional data supporting the identified themes and checking whether they hold their explanatory power with regard to the superordinate research questions. In doing so, we ensured that these themes contribute to our study in a significant way. (5) In step five, the final set of themes was defined. Additionally, we checked whether they, as a whole, depict a coherent illustration of our main findings that fit the paper and the overarching objectives. The data analysis yielded five main themes, namely Additional Expenditure, Use of Technologies, Communication, General Standard, and Trust. (6) The last step involved the act of writing down and correlating the findings in a comprehensive way, forming a compelling story (Braun and Clarke 2012). Table 1 provides coding examples contrasting the engaged sample groups.

Codes	Mobile care	General practitioners
(Travel) Time	<i>"[...] time-consuming, if you are sitting in a general practitioners' office,[...]you are sitting in the waiting room for three-quarters of an hour, [...]that is wasted time, that is not paid."</i>	<i>"They report many things, but they are not that dramatic. Then you drive there, and it was, would have had also time for the next day."</i>
Pictorial aid	<i>"[...], of some forms at the customer's, the system would already give away, [...], so new medication schedule is there, I scan with the mobile phone."</i>	<i>"[...] it would be a relief if you had a picture and not just the image of the person he is telling it to, but a real picture and then you say, ok, then I will come, I will look at it. "</i>

Table 1. Coding examples.

Findings

To preserve the anonymity of interviewees, we assigned a random number to each interview. The two mobile care groups are respectively numbered within nurses and management. The managers of mobile care are therefore crucial to the study, as they are usually the first chain link in terms of communication with the GPs and can provide insights into the problems for others than the nurses. Therefore, the results indicate whether the statement comes from the management or the nurses. However, since the problems of mobile care relating to GPs are considered in general, the propositions consider them as unit. Hence, the statements originate in a group discussion rather than an individual statement. Analyzing the results more closely, a frequency distribution of the statements across the two stakeholder groups can be observed. It is noticeable that the GPs see less problems in the communication with mobile care personnel than the other way around. We will use GP as an abbreviation for general practitioner and MN for mobile nurse and MM for mobile management respectively.

Additional Expenditure: This category represents a major issue for everyone involved. In literature, health expenditure is not a new phenomenon (Zhang, 2013). In most cases, it describes the economic factor of health technologies. In terms of numbers, it is the most frequently mentioned problem emerging from the interview data. The results indicate that overall, one of the main problems is the additional expenditure, but if you look at the statements of the general practitioners, it appears only as a time expenditure. The sixth GP interviewee claims to have no problems at all compared to outpatient care. The first GP interviewee claims that they have no problems with communication towards the nursing institutions. Sometimes they have some issue to clarify, but it could be resolved with a phone call: *"[...]there are some problems, but with a phone call [...]everything can be cleared up relatively quickly, so I do not see this big problem now."* (GP 1) One practitioner declaims that at times they would write down everything on paper and get the result per letter, and then they have to enter it into the PC. This would mean a considerable additional expenditure *"[...]write everything on paper [...]have to laboriously enter everything into the PC again for the next two days"*(GP6). In the interviews with nurses, it is criticized that the general practitioners caused an additional expenditure of time. However, it should also be noted that this is not always caused by a general practitioner, but in some cases, the medical assistants must also be held responsible for the increased waiting times. According to one MN interviewee, they often visit the general practitioners personally to pick up prescriptions. Alternatively, in some cases, they conduct initial talks with new patients in cooperation with the general practitioners. However, this does not always save time to talk in person: *"[...] time consuming, if you are sitting in a general practitioner's office[...] you sit in the waiting room for three-quarters of an hour, and that is wasted time that is not paid for"*. (MN 2) It becomes apparent that mobile care employees see more problems and want to be relieved from the burden of managing processes GPs are (partly) responsible for. An additional problem, as described by MM, was that they have staff-related issues. As a metaphor, this deficit is described as a fight for personnel: *"It is about lacking personnel [...] we are under such pressure personnel-wise [...]very hard at the economic limit"*(MM 1).

Use of Technology: This category describes different perceptions of the behavior of general practitioners when using technology. As the conducted interviews suggest, the handling of innovative technologies can differentiate individually. MM states that there are two camps of GPs, the "modern" and the "medieval" one. An excellent example for this is the second statement from MM, in which they describe that not everyone has the capability to fax: *"I think we have the problem here on site that some general practitioners still live almost in the Middle Ages [...] Yes, the medieval camp and the modern age [...] Sometimes you cannot even send a fax because they do not have a fax machine."* (MM1) These are specific problems in this rural area, but they would also like to have technical support and would like to use it. For example, in order to save time, the institutions would like to be facilitated by pictorial aids. General practitioners also see relief in telemedicine. GPs, they hope that the telemedical solution will provide economic relief and time-savings. They would be able to make an initial diagnosis more easily via remote monitoring and treatment with the help of imaging techniques. In the case of a wound, it is better to have a look at pictures than only rely on descriptions of the wound by patients or nurses. In doing so, one would be able to notice whether there is a need for action more quickly, saving travel expenses, but also countless questions about the wounds and their treatment: *"It would really be a relief if you had a picture and not just one vividly described by the patient[...] will look at it"* (GP 2)

Communication: Communication is defined as “Communication is transfer of information from one person to another, whether or not it elicits confidence. But the information transferred must be understandable to the receiver - G.G. Brown” (Hans and Hans 2014). So, it is necessary to look into the ways of communication and how digital communication affects the relationship between GPs and mobile care staff. Our data suggests that the digital structures and communication channels in particular cannot be entirely separated from each other. However, not all problems should or will be solved by telemedicine. GP interviewee 4 said that it is sometimes necessary to speak in person. Frequently, further questions arise from the course of the conversation: “[...] to discuss this frequently on-site, because sometimes questions arise that were not clear before. [...]you do not know everything on the phone beforehand.” (GP 4) The mobile care wishes for a network and a platform for sharing their work to be established: “The networking: If I now imagine that there would be one unit page per customer, which everyone who works with him could access directly and see what the others were doing, that would make our work much easier.” MM 1 describes that their biggest problem is the communication within the practitioners and that they were not able to communicate properly: “I think the biggest problem in this whole chain is the general practitioners [...] mostly problems with the medical practitioners because they are not able to communicate. No writing letters to the general practitioners, no giving information to any area.” (MM 1) Therefore, our data suggests that mobile care providers see differences in the role of communication between them and general practitioners. GP interviewee 6 describes that there are no communication issues towards the nurses at all: “[...]As long as one speaks, there are no problems [...] that is a question of conversation [...] they do not understand each other[...].” (GP 6) The last part of the statement reveals further issues. It describes that they all have to communicate and that the GPs see that nurses not always talk properly. The interviewee pronounces that it is only a question of conversational abilities.

Standards: The ISO (International Organization for Standardization) is a worldwide organization that develops standards for different branches, including the health sector. They pronounce that more than 1400 ISO health standards contribute to implementing health services, the exchange of information, aggregating data, and protecting an individual's privacy. However, with such a high number of standards, it is only understandable that the individual actors do not precisely know which standards exist and how to apply them. A GP interviewee declares that they are not aware of the standards followed by the MN sector. It seems that each institution sets its own set of standards: “Because in principle, they are forced to have certain things clarified in the old people's home, [...] everyone has his own specifications.” (GP 1) A good example may be a statement from one of the MN focus groups. It shows that in this rural area, not all GPs are aware of the legal requirements. They pronounce that the GPs did not know that they have to get medical certifications. As an example, when a new patient be accommodated, they have to get a medical referral: “Medical certificates, [...] every facility is required to provide a medical certificate [...] this caused a drama as if they have never seen these certificates here before.” (MN 3) One statement from a GP interviewee relates to the statement. They do not understand the necessity of a certificate: “They need a certificate, which is also not standardized [...] who is going to pay for it? We do the work there, but that is just for the formal [...]” (GP 5) For GPs, adhering to general standards appears to be very time-consuming in some cases. For example, one interviewee declares that they use different softwares and that they have no pre-defined grids to show and manipulate patient data. The information is not sorted, making it hard to identify the patient, their condition, and the history right away: “We work with different grids[...].” (GP 7) In addition, information about patients and treatments are not getting merged and are formatted differently, leading to further confusion: “it is quite critical that the nurse facilities have its drug lists. We have our list of medication, sometimes a general practitioner comes to the home and changes something –[...] Then there are different lists, and then they always have to be compared.” (GP 5) In relation to this issue, the MN participants also indicate that the used technologies, forms, and input masks lack standardization. Simultaneously, they expect the ongoing digitalization to introduce missing standards: “[...] different programs and there is no uniformity [...] someone should look first to create a reasonable basis for communication.[...] if everyone had the same forms, this would work much better.” (MN 1).

Trust: As our last category, the interviews suggest that trust is an essential factor affecting identified communication issues and the use of digitalization. At times, GPs may not deem the competence of nurses (or nurse assistants) adequate in specific situations, potentially alleviating trust in their assessments. The problem of lack of trust is twofold. The practitioners say that they do not know the nurses well and cannot assess their competencies, so they might not trust their statements in some cases. Furthermore, communication within the institutions does not work properly either, because the early shift and late shift

do not communicate properly about whether there something unusual about the patients: [...] *you have early, late, and night duty, you have often three nurses, and you have three different information regarding a problem.*" (GP 3) and "[...] *on the one hand, they are not my direct employees, and I do not know how I can rely on them, but also sometimes the knowledge simply is not there.*" (GP 2) Alternatively, the second MN group mentioned that they sometimes could not trust the GPs to show up as they promised, they have no influence on what the practitioners do with the redirected informations." [...] *what the partner does with it in the relationship, I can no longer influence.*" (MM 2).

Discussion

Based on the findings, we can formulate five propositions. These propositions inform about the relationship between practitioners and mobile care and the use of health technologies in care. In the following we explain the proposals and give implications for research and practice.

Proposition 1: Mobile care places a high value on the possibility of having a personal conversation with general practitioners. They see a greater need for communication than the general practitioners do.

This statement makes clear that communication is an important part of regular care. Instead of digitizing the processes in general, there is a desire for personal conversation. Nevertheless individual communication channels are desired. These would be particularly helpful in case of queries regarding treatment or prescriptions. Mobile care therefore considers it useful to have a faster communication channel to the GPs than to the patients themselves. Through digital progress and the use of a tablet, smartphone, or sensor technology, they could envision more straightforward communication channels. From a technical point of view, this proposal calls in particular for ways to facilitate rapid contact with the general practitioners or specialists. Digital tools, such as a platform to share and access patient data, can thus invoke the feeling of faster availability. The quality of this interprofessional communication can be improved by empathy and adaptation to individual needs (Abrahamsson et al. 2015).

Proposition 2: The additional effort could be eliminated with more digital support systems

As our results show, the participants want technologies that can bridge distances and thus increase the availability and accessibility of needed expertise. Nurses would welcome the use of technologies that allow independent access to a general practitioner. The use of telemedicine could reduce both long travel and waiting times. From a technological point of view, it makes no difference whether the digital support systems are used by the patient or by the mobile care providers on site, so the general practitioner would also benefit from integrating the option for patients to provide data by using the system. Especially imaging techniques and the possibility to transfer images, e.g. for the first anamnesis or diagnosis, are desired. The obligation to travel to the general practitioner's practice could also be reduced for patients that are taken care of at home. One remaining problem that technical progress is not able to fully solve, yet, is the lack of qualified personnel. However, attempts can be made to create new structures to create a productive and flexible workplace, which incorporates innovative digital tools and potentially increases job attractiveness. As studies from other sectors show, digitisation can drive productivity and employment growth and is therefore an economic factor (Evangelista et al. 2014).

Proposition 3: Mobile care is more likely to use digital technologies than general practitioners.

This proposition is initially based on the statements of mobile care. They declare that there is a very high variance amongst GPs with regard to attitudes towards an actual use of technologies. According to the interviews it seems that some GPs have fallen behind in the use of modern technologies. Some of them would not even use a fax machine, which is a common way of exchanging information (e.g. medication plans or referrals). In addition, a general practitioner complained about how long it takes to write things down on a computer and that handwriting the diagnosis would be much faster. We could observe this development towards the apparent additional effort through digitalisation primarily in the statements to and from the GPs. Mobile care, on the other hand, is already using intelligent technologies to communicate with each other (Farrell 2016). One way to explain this is the age-gap. According to the interviewees, the average age of executing care employees is lower. Thus, they represent a generation that grows up using modern technologies. Nevertheless, the use of technologies is desirable for both sides and greatly relies on proper guidance and facilitating factors. In the background, as an inhibiting mechanism in the use of technologies, data protection plays a major role in the medical sector. Practitioners are worried about

sensitive patient data falling into the wrong hands if they share it with others. However, since technology in a care scenario requires the disclosure of patient data, research suggests that a high level of trust can compensate for even a low level of privacy. It is essential to control the access to data through manageable lists of authorized persons and institutions (Benaloh et al. 2009). Technological innovations will continue to change healthcare, such as new medicines and treatments, new devices, and social media. Yet, human factors such as individual adoption and use behavior will remain one of the forefront limiting factors of breakthroughs in digitized care (Thimbleby 2013).

Proposition 4: So far there are only a few standards in the standard care in the area of digitalization or communication, which can be used by both (GP and MN).

In the investigated region in Germany there seem to be few uniform standards in the direction of digitization, which are also followed by the actors. Actually, ISO standards have been established by the KVBs (International Organisation for Standardization 2019). However, these standards also reduce the billing in order to guarantee financing and billing to the health insurance companies. In the area of software or hardware use, everyone uses the systems that suit him best. Therefore there are no uniform health information systems or interfaces in the region that could be used to facilitate communication and to transform data easily. There are also no standards for documents such as medication plans. The use and maintenance of the uniform medication plan, especially in mobile care, would be helpful to create standards, but to our knowledge they are not being adhered to. The documentation has not yet arrived completely in electronic form in the healthcare system. And therefore a standardized documentation of reports is often difficult. Many actors, including practitioners and care services, give priority to what is best for their own business. Other actors often seem to play a secondary role in deciding which health information system and protocols to use, which prevents beneficial cooperation.

Proposition 5: The trust in each other relates to occurring communication issues. General practitioners' trust in nurses and vice versa is an essential factor that precedes the beneficial use of technology.

The identification of trust as a promoter for technology use by GP and MN allows for several new approaches. For instance, one trust-generating factor emerging from the interviews is the knowledge of the employees. When the GPs do not know the nurses, trust in their opinions is initially low. Here, for instance, one important factor is confidence. Confidence is required for active engagement in interprofessional collaboration (Pfaff et al. 2014). In Germany, oftentimes GPs are bestowed a more prestigious status compared to nurses. Even in the interviews, the nurses assign a high social status to practitioners. Therefore, it is perceived by nurses to be difficult to engage with practitioners at eye level, especially in case of conflicting opinions. In addition, to overcome communication issues, digital technologies could also create more trust in nurses' work. For instance, pre-recorded pictures and messages (e.g., medication advice or pictorial representation of wound care) can create trustful and intimate settings without having to patch in a practitioner. Since the trust relation of general practitioners and care is essential for good healthcare, it is necessary for them to have a good relationship.

Conclusion and Outlook

Following RQ1 ("Which problems occur in the process of cooperation between nurses in mobile care and general practitioners in rural areas?"), the predominant factors that constitute the relationship seem to be communication and trust. The interviews made it clear that communication is often not very efficient. All actors involved (general practitioners, mobile care) are equally affected. Uniform documents and standards could help to minimize bureaucratic efforts and misunderstandings. Separate telephone numbers and platforms for communication between healthcare providers could also be helpful to enable them to contact each other more quickly. Hence, digital technologies should foster efficient and mutual communication and thus improve cooperation, which currently seems somewhat awkward. Cooperation also relates to the perceived social status of practitioners. The supposedly higher status of the practitioners makes it more complicated, and responsibility is rarely transferred. To answer RQ2 ("How can digital technologies solve identified problems?"), this study shows that mobile care and general practitioners have recognized the trend and partial necessity to incorporate new technologies into their practices. The desire for digital structures within communication (e.g., through telemedical solutions) has become apparent. As our data indicates, a lot of the issues (economic factors like time, or personal factors like trust) could be solved by a digital communication platform, a telemedical concept, or text message-based interventions (Mahmud et

al. 2010). It becomes apparent, that the issue of providing a functioning digital infrastructure (e.g., internet access and speed) in rural and remote areas still needs to be addressed and represents a prerequisite to testing and evaluating digital technologies in active care. The study also shows that there is an interest in improving healthcare in areas with a (future) lacking supply of patient care services. The study reveals many gaps that oblige different actors to work together. However, many general practitioners in the given area deem their timely involvement in digitization unrealistic. It remains an open question whether this is a problem due to age structure within the healthcare system, calling for further investigations.

Our study is subject to some limitations. First, we are aware of the difficulties that can arise during focus group sessions, such as conformity through dominant opinions, idiosyncratic statements, or the low level of generalizability (Stewart and Shamdasani 2015). Besides, an mobile care executive was present during the discussions, which may have prevented honest criticism by the employees due to power relations. Second, we have examined rather small and homogeneous samples, which further limits the generalizability of our study. Further studies with a higher outreach are helpful to bridge the limitation that arises from the participants coming from a single region. Further studies can aim for testing our findings engaging a more significant number of participants through quantitative methods (e.g., online surveys). Third, incorporating theoretical concepts and insights from other disciplines (e.g., care research) as well as cultural factors into the data analysis could yield further results. Therefore, our study opens up many successive future research opportunities. For elderly people, functioning and patient-centered cooperation between nurses and general practitioners is crucial. One important complementary research activity involves future studies that incorporate other players involved, e.g. stationary care, pharmacies, and clinics. Shedding light on the way these actors work together allows for establishing a more holistic model of communication structures, associated issues and barriers, as well as potentials for digital tools as an optimizing measure.

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