

“Why the Hell Do We Need Electronic Health Records?”

EHR Acceptance among Physicians in Private Practice in Austria: A Qualitative Study

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Summary

Background: Progress in the medical sciences, together with related technologies, in the past has led to higher specialization and has created a strong need to exchange health information across institutional borders. The concept of electronic health records (EHR) was introduced to fulfill these needs. Remarkably, many EHR introduction projects ran into trouble, not least because they lacked the acceptance of EHR among physicians. Negative emotions, such as anxiety and fear due to a lack of information, may cause change barriers and hamper physicians' acceptance of such projects.

Objectives: The goal of this study was to gain deeper insight into the negative emotions related to the intended implementation of a mandatory national electronic health record system (called ELGA) in Austria among physicians in private practice.

Methods: Qualitative, problem-centered interviews were conducted with eight physicians in private practice in the capital region of Tyrol. The methods of qualitative content analysis were used to analyze the data.

Results: Three hundred and twenty-eight passages in the interviews were selected, annotated, and paraphrased. These passages were assigned to 139 different primary categories. Finally, 18 main categories in the form of statements were derived. They were correlated and a theoretical model was formed to explain the genesis of the detected fears and anxiety related to the ELGA project. The results show that the physicians feel uninformed and snubbed. They fear unknown changes, increased costs, as well as workload and surveillance without obtaining any advantages from using electronic health records in their daily practice.

Conclusion: Impartial information campaigns that are tailored to the physicians' needs and questions as along with a comprehensive cost-benefit analysis could benefit the physicians' opinion of EHRs.

year since 1965 [2]. Besides for general medical knowledge, the amount and complexity of the available patient-specific data also increases. This can be traced back to various reasons such as novel methods for diagnosis or treatment that are supported by an enhanced utilization of information and communication technologies [3].

Among other things, this development leads to a higher specialization of health care professionals and institutions resulting in a strong need to exchange information between all the parties involved in patient care. In order to be able to provide optimal patient care, it seems essential to guarantee optimized information logistics, which means providing the right information, at the right time, in the right quality, quantity, and form, to the right addressees, and at the point of care [4].

The concept of electronic health records (EHRs) has been introduced in order to deal with these challenges [5, 6].

In the context of this article, the term *EHR* is – following the definition from ISO/TR 20514 – understood as: “a repository of information regarding the health status of a subject of care in computer processable form, stored and transmitted securely, and accessible by multiple authorised users. It has a standardised or commonly agreed logical information model which is independent of EHR systems. Its primary purpose is the support of continuing, efficient and quality integrated health care and it contains information which is retrospective, concurrent, and prospective” [7]. We further want to restrict the concept of EHR to the purpose of cross-institutional information exchange.

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1. Introduction

Scientific progress leads to an enormous amount of exponential growing data, in-

formation, and knowledge [1]. This is especially true for the medical domain, e.g. the number of articles and citations in Medline has increased exponentially every

1.1 Current Status of the EHR in Austria

Austria has provided the basis for an introduction of an EHR in different ways so far. All citizens were provided with a smart card called an e-card, which contains basic administrative information such as one's social security number, name, gender, etc. and is used for patient identification primarily by the social security services. The e-card also offers signature-functionality if activated and can, therefore, be upgraded to a citizens-card (Bürgerkarte), which can be used for e-government applications or for private use [8].

Apart from the e-card infrastructure, the health reformation law (Gesundheitsreformgesetz [9]) – which was passed in 2005 – is one of the major formal steps towards an electronic health record in Austria. In this law, the introduction of an EHR in Austria was explicitly defined as a goal. Here, EHR is understood as health-related information that is shared on demand between healthcare institutions as well as physicians in private practice, using a central EHR directory service to locate and access clinical documents. In the public media, the term ELGA (elektronische Gesundheitsakte, electronic health record) is used as the name for this Austrian EHR concept.

In order to initiate the actual development of an EHR, a feasibility study [10] was commissioned to collect relevant basic information. The first results of this study were presented at the end of 2006. The study contained a description of the present legal, scientific, organizational, and functional environment as well as the requirements for a basic EHR architecture and functionality. A master plan, based on the initial study, was developed in 2007, which describes the core EHR functions – such as the exchange of lab reports, radiology exports, discharge letters, and medication information – and a document meta-index as a basis for the proposed functions [11]. By the end of 2007, the detailed planning of all the components commenced. Until now, all of the results developed have been discussed by the Commission for State Health and the Ministry of Health.

Apart from the efforts taken by the state, there are several initiatives and organizations establishing prototypes of EHRs in Austria. These projects closely cooperate with public initiatives, but either share a more scientific or practical view on the EHR. In addition, the different stakeholders in the field (physicians, medical associations, patients' organizations, NGOs, etc.) became caught up in a heated debate, charged with emotions, concerning the intended EHR implementation.

1.2 Physicians' Acceptance as a Crucial Factor for a Successful EHR Implementation

In particular, the Resident Doctors' Association adamantly refused the EHR plans in Austria. A doctors' strike and several protest rallies were organized, the Doctors' Association representatives termed ELGA “a highly dangerous thing” and “a project, coming by stealth” [12]. They asserted that the ELGA project would aim to introduce an “IT-industry incited and pushed monitoring and espionage system”, that ELGA would “undermine patient/physician confidentiality”, bear an “enormous risk potential regarding data privacy” [13], and could “mark the first step into a totalitarian surveillance society” [14].

Although the things have calmed down now, the physicians' acceptance of the ELGA project is still poor, and the degree of controversy is characterized as high by [15]. An actual overview of the current status of the ELGA project in Austria, the involved actors and their positions can also be found in [15].

Emotions may play an important role whenever humans have to take decisions [16]. Doctors having negative emotions, such as anxiety and fear related to the ELGA implementation, may develop resistance – change barriers – against the implementation. Change barriers motivated from anxiety and fear represent a major risk for the success of a project and can even lead to complete failure [17].

Many stories describing the failure of implementing changes in health information systems can be told. A prominent example, OSCAR's fail, was reported by

Williams [18]. It is important to gain a better understanding of these failures in order to be able to learn from the mistakes of the past. The amount of change – the design-reality gap – between the current situation to the expected new situation seems to be a major factor for the failure or success of changing health information systems [19].

Introducing a nationwide electronic health record system represents enormous change for the various stakeholders. Whereas public opinion (state of knowledge, interest, and acceptance of electronic health records) has been investigated by interviewing Austrian citizens [20, 21], a comparable study systematically analyzing the physicians' opinions, needs, and caveat could not be found in Austria.

2. Objectives

The goal of this study was to gain deeper insight into the negative emotions related to the intended EHR implementation among physicians in private practice in Austria. The following study questions were defined:

- Can negative emotions, fear, or anxiety related to the intended introduction of a nationwide EHR be observed among physicians in private practice in Austria?
- What kinds of negative emotions, anxiety, and fear can be detected?
- How can the different kinds of negative emotions, anxiety, and fear that are related to a nationwide EHR be characterized?

3. Methods

A qualitative design based on problem-centered interviews was chosen. A quantitative approach was considered inferior due to the lack of detailed pre-existing studies on the genesis and quality of such negative emotions.

3.1 Data Collection

This study was conducted in mid-2008 and included general practitioners and special-

ists in private practice from the capital region of Tyrol (Innsbruck and the surrounding district). Sixty corresponding physicians that were listed in the telephone directory were contacted and asked to take part in an interview by fax or e-mail. Overall, 11 physicians agreed to participate.

The number of experts that were finally interviewed was determined by using the method of theoretical sampling and saturation as described in [22], which means that the data is collected until no new information regarding a category is obtained.

A total of eight physicians, namely one surgeon, one dermatologist, one ophthalmologist, one psychiatrist, one gynecologist, one radiologist, and two general practitioners were visited in their practices and interviewed by one researcher. Seven of the interviewed physicians were running their own, single practice. One was employed in a three-physician group practice. Six out of the interviewed physicians were full-time private physicians, two were also working in hospitals part time. One out of the interviewed physicians was active in the Resident Doctors' Association.

The qualitative "problem-centered interview" as described by Witzel [23] was chosen as the method to be used for data collection. An interview guideline was developed, tested, and adapted.

The eight problem-centric interviews had a mean duration of 16 minutes (± 6 min) and were all recorded by using an audio recorder. In addition, interview postscripts were made. They included observations that the interviewer had made during the interviews (e.g. gestures, mimicking, and mode of speaking) and also registered statements that the interviewees had made after the recorder had already been turned off. As this action denotes the "official end" of an interview, some interviewees feel relieved and unobserved and, therefore, divulge interesting details and personal opinions that they would not tell while being recorded [24].

3.2 Data Analysis

The recordings were transcribed literally. The resulting 40 text pages, plus the postscripts, were interpreted by using the meth-

od of qualitative content analysis as described in [25]. Thereto, the audio recordings were listened to repeatedly in addition to carefully reading the transcripts. Then, the different passages in the transcripts containing statements related to negative emotions, fear, or anxiety were commented on and annotated. In the next iteration, the step of "controlled interpretation", the annotated passages were paraphrased with generalized expressions, again in several iterations. After 30–50% of the material, the comments, annotations, and generalized expressions were revised before going through the remaining material. After going through the particular interviews horizontally, the next step of "generalizing analysis" led to a vertical view, where all the interviews were compared with each other in order to find similarities or different statements. Similar passages were also assigned to primary categories that were then merged into families of main categories in

the form of statements. In the following controlling phase, the results were again compared to the first, uncondensed transcripts and the audio recordings in order to avoid misinterpretations. The software tool "Atlas.ti" [26] was used to support the qualitative content analysis.

4. Results

Three hundred and twenty-eight passages in the transcribed texts were selected, annotated, and paraphrased. These passages were assigned to 139 different primary categories. The primary categories were then merged into families. Finally, 18 main categories in the form of statements were derived. They were correlated and a theoretical model was formed to explain the genesis of the detected fears and anxiety related to the ELGA project. ▶ Table 1 summarizes the 18 final main categories sorted by the

Table 1

The final 18 categories of negative emotions of physicians versus the EHR, sorted by grounded value (frequency of mention in the interviews). In an interview, a statement could be mentioned (and counted) several times.

No.	Category (formulated as generalized statements)	Grounded value
1	Physicians are unsettled due to missing, insufficient, or negative information about ELGA	43
2	Data privacy and data protection is not guaranteed	41
3	EHRs cause additional workload and loss of time	36
4	Unauthorised third parties will use EHR data	35
5	Physicians will be other-directed due to EHRs	21
6	EHRs lead to a controllable, transparent doctor	19
7	Accustomed workflows have to be changed by reason of EHRs	19
8	The cost of EHRs will be shifted to the physicians	18
9	The benefit of EHRs is not known	17
10	EHRs lead to a controllable, transparent patient	14
11	The usability of EHRs will be insufficient	12
12	EHR data will be used punitively against physicians	11
13	The time is not ripe for EHRs	11
14	EHRs lead to two-class medicine	9
15	EHRs will be implemented imperfectly	7
16	EHRs will fail due to the scarce cooperation of physicians	6
17	Too much information narrows and blurs the vision	4
18	A system change always causes media breaks and causes a loss of information	1

grounded value (frequency of mentions in the interviews) in descending order.

The Network Editor of Atlas.ti was used to illustrate the interdependencies of the main categories in a graphical network view. Figure 1 illustrates the network interrelation of all the main categories using labeled arrows which were developed during the generalizing analysis phase. The categories with the top ranked grounded values were placed in the center of the network,

work, as they depict the central, most important aspects mentioned by the physicians in the interviews. The bracketed numbers denote the grounded value (first number) and the density value (second number, sum of the connections to the other categories).

Additionally, for each of the 18 primary categories, a sub-network view was developed. As an example, Figure 2 shows the sub-network view for the main category

“Data privacy and data protection is not guaranteed” with its sub-categories.

In the following paragraphs we describe the five top ranked (Table 1, centrally placed in Fig. 1) categories in more detail, by quoting distinctive statements from the interviews at first. Then, we summarize the interviews pertaining to the respective category and, finally, we characterize the connections to the other categories.

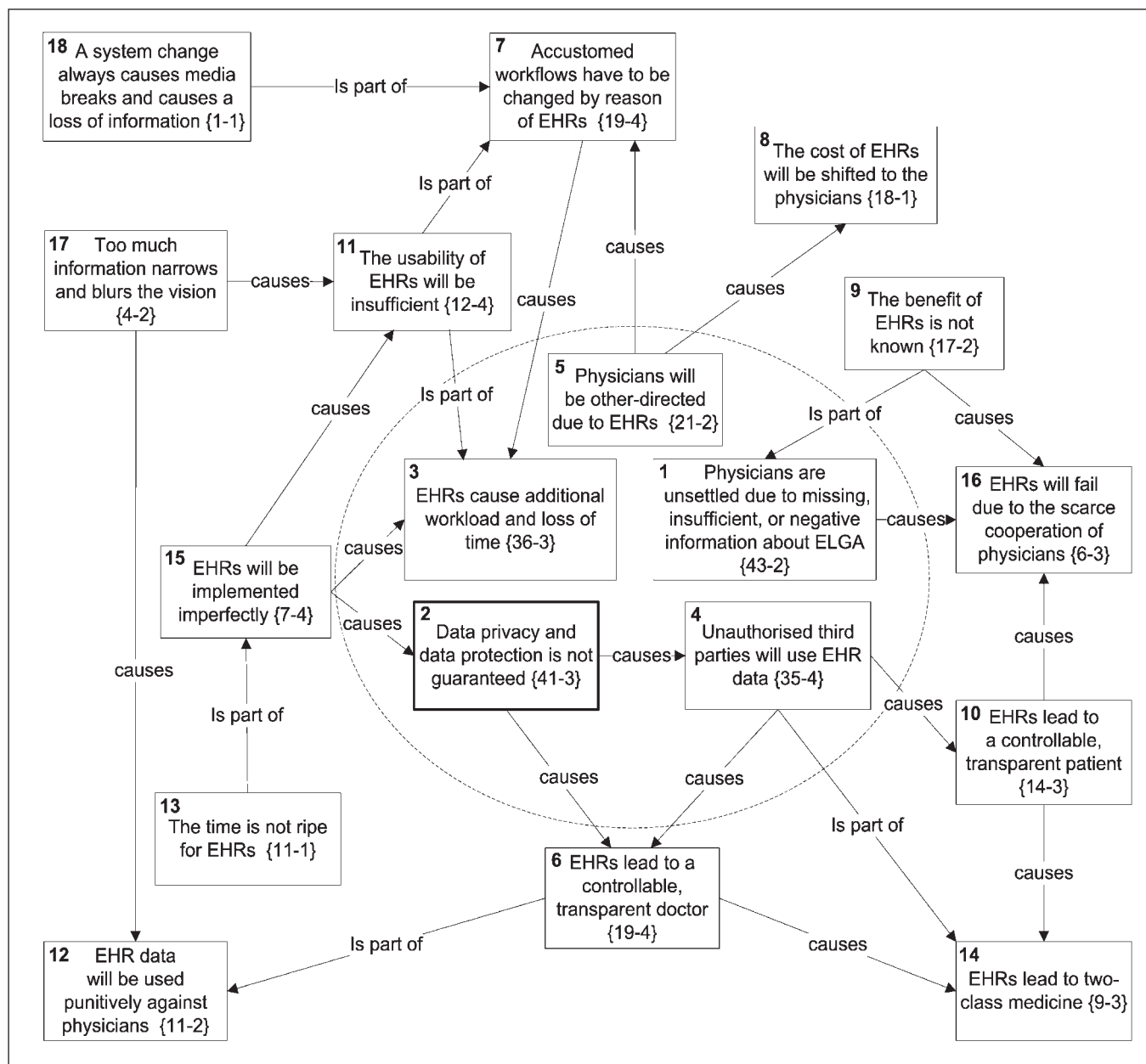


Fig. 1 Graphical network interrelating the final 18 categories of the negative emotions of physicians versus the EHRs. The bracketed numbers denote the grounded value (frequency of mention in the interviews) and the density value (sum of the connections to the other categories). The number of each category corresponds to the number in Table 1.

1 Physicians are unsettled due to missing, insufficient, or negative information about ELGA (43)

- “I don’t know how far reaching this is planned” (Dr. A)
- “I am not sure, whether it is written down so far, somehow or another, as to how it will work from a technical point of view” (Dr. B)
- “It is unclear to me what my role concerning the data input shall be” (Dr. B)
- “Something will come of it ... I have no clue, actually” (Dr. G)

The interviewed physicians think that their own and the general level of knowledge among physicians concerning the national EHR project (ELGA) in Austria is low. In their opinion, the public authorities (Ministry of Health and social insurance organizations) do not provide reliable information about ELGA. The professional associations do provide, on the other hand, information in newspaper articles, press releases, and information events, but the interviewees feel that mostly the negative aspects are emphasized. After attending such an information event, two physicians felt even more anxious than informed. The interviewees would like to have more insight into the planning stage and status quo of the ELGA project. They do not know what ELGA will bring for their future or what their role will be working with a mandatory national EHR. Hence, they feel fear and anxiety of something that is unknown. They cannot imagine working with EHRs in the future. They have no concrete idea of ELGA and they cannot imagine how they can benefit from EHR use (category 9).

2 Data Privacy and Data Protection Is not Guaranteed (41)

- “I have no idea of how many swindlers are at large ... you know, this is a lot of confidential data” (Dr. E)
- “Every system can be cracked”, “There is no burglarproof system” (Dr. E)
- “A central data storage increases the security risk” (Dr. F)
- “Wherever you have data, misuse is pre-programmed” (Dr. D)
- “Suspiciousness is advisable to an extremely high degree” (Dr. E)

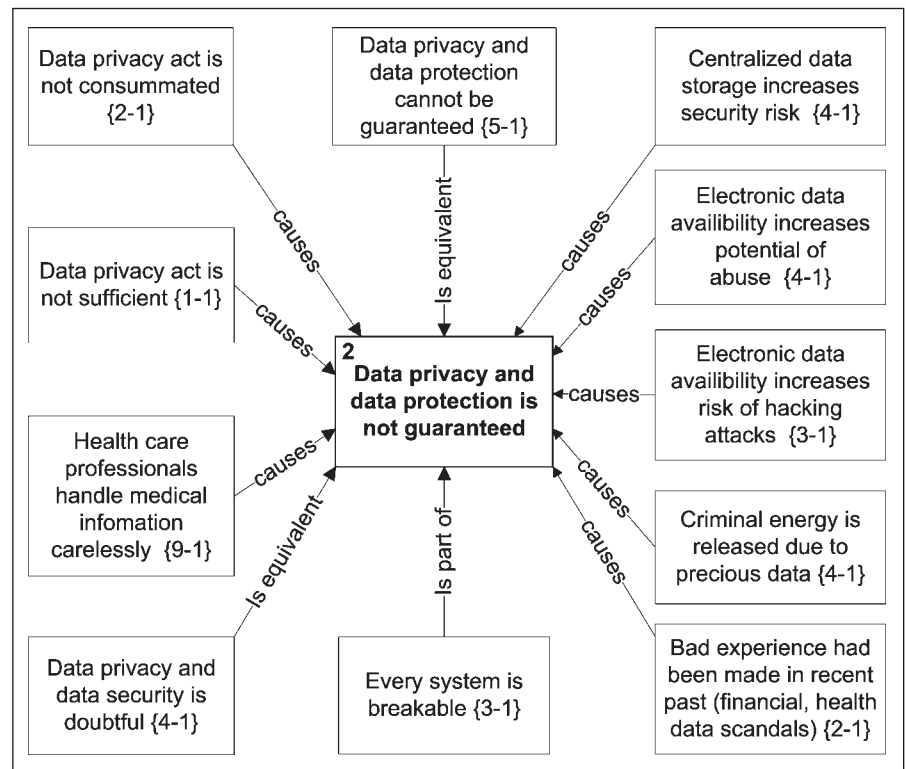


Fig. 2 Graphical network for category 2: Data privacy and data protection cannot be guaranteed (highlighted in Fig. 1). The bracketed numbers denote the grounded and density value.

In addition to the observed general uncertainty and fear of something unknown and intangible as described previously, almost all of the interviewees expressed a clear and even strong fear that data privacy and data protection cannot be guaranteed by the EHR developers. The physicians fear that the precious, centrally stored, confidential health data will attract “hackers and spies” and they assume that no electronic system can be secured against hacking attacks. Additionally, they fear that ELGA will be implemented imperfectly (category 15) and, therefore, they think that some security vulnerabilities will appear in the EHR. Furthermore, it was assumed that corruption could lead to leaks in the EHR security concept. In this regard, one physician mentioned some cases that were reported in the media where bank details or health data e.g. in Great Britain had been “lost” or stolen and sold.

4 Unauthorized third parties will use EHR data (35)

- “Where you can see that they [note: the association of the social insurances]

have surveilled us, during the strikes” (Dr. C)

- “They won’t ask you if the data is stored centrally” (Dr. E)
- “That’s none of the state’s business!” (Dr. E)
- “If a big employer screens the data or forces you to allow them to look at your record...” (Dr. B)
- “... oodles of tailored advertisements ...” (Dr. F)
- “Information moves to the insurance companies” (Dr. A)

The fear of the use of EHR data by unauthorized third parties is directly connected to the fear of insufficient data privacy and data protection (category 2).

The interviewees consider personal health data as extremely precious and valuable for many companies (e.g. private life and health insurance companies, pharmaceutical companies, manufacturers of medical devices, employers, etc.). In addition to the dreaded scenarios of illegally obtained data, they assume that those com-

panies will find legal opportunities and legal loopholes to obtain the EHR data some day.

Furthermore, the interviewed physicians estimate that public authorities such as national social insurances or policy-makers will use EHR data to gain information on potential savings and to detect starting points for structural changes of the health care system to their own detriment.

The physicians fear that EHR data could be used to find “undesirable” physicians or patients who e.g. cause above-average cost. Therefore, they fear that this will lead to controllable and transparent physicians (category 6) and patients (category 10) and subsequently to a two-class medicine (category 14) where patients who can afford to pay for “private” treatment and, therefore, are able to bypass the documentation of the treatment in the national EHR have an advantage and obtain better care.

3 EHRs cause additional workload and loss of time (36)

- “Everything causes a lot of work in its first ten years” (Dr. F)
- “If it then takes up my time extremely” (Dr. A)
- “From changes in the flow of daily work up to administrative overkill there is a great danger” (Dr. H)
- “Everything with a distinct report – filling pages!” (Dr. C)
- “That means if something is not ready I will be held responsible for that; and this would cause tremendous effort, bureaucratically and temporally – that is the point in my opinion!” (Dr. D)
- “Because a private practice takes random notes at best” (Dr. B)
- “When I studied medicine, administration was a marginal border area – when I compare it to today, administration comprises 50%. That means eHealth blocks me and hampers my work.” (Dr. H)

The interviewed physicians report that in their opinion the administrative effort increased significantly in recent years. They fear that, in addition to that, the time needed for administrative tasks and workload due to increased responsibilities in medical documentation caused by ELGA

will increase considerably or even severely. Furthermore, some physicians fear that the poor usability of the EHR system (category 11), suboptimal implementation (category 15), or information overload (category 17) will amplify this negative effect. In addition to these three fears, which mostly were motivated by a bad experience with other IT systems, the physicians fear that they involuntarily will have to change accustomed and established workflows through the EHR implementation (category 7).

5 Physicians will be other-directed due to EHRs (21)

- “It is a matter of savings, otherwise there will be no reason to do this, I believe. This is truly the only reason for the legislator to do this, to avoid double-tracked things and multiple appraisals, inefficient things. This has to be solved in a different way!” (Dr. E)
- “Consequently, the physicians are forced to participate!” (Dr. E)
- “Again we get the short end of the stick, the private practice is the weakest link in the whole thing” (Dr. H)
- “If I am restrained to all intents and purposes” (Dr. A)
- “Merely the physician has never been asked!” (Dr. H)

The physicians feel that they are never asked when substantial changes of the healthcare system are planned. In the recent past, they have been confronted with some organizational or technical innovations (e.g. electronic approval for specific prescriptions, e-card system) that caused additional effort and cost (category 8).

They feel that with such changes the disadvantages outweigh the advantages for their daily work, and they sense that they will not profit from EHR use. On the other hand, they see and hear that huge efforts are being put into the implementation project. Thus, they conclude that ELGA would be promoted by “different powerful and influential interest groups” that want to profit from ELGA. Therefore, they believe that they will be forced, against their will, to participate in a national EHR.

4.1 Results in a Nutshell

In summarizing the generalizing analysis, the interviews showed that the physicians are unsettled and anxious concerning the implementation of a national EHR system in Austria. They doubt that EHRs will produce any benefits for their daily work. On the contrary, they fear that EHRs will cause additional workload, loss of time, and cost and bear eclectic dangers. The interviewed physicians expressed a strong and distinct fear of the unauthorized use of centrally stored or available EHR data by unauthorized third parties to the detriment of physicians and patients.

5. Discussion

This study was planned and conducted conscientiously. A topic being highly relevant to health policy, science, economy, and society and that has been discussed controversially, very emotionally, and even heatedly by the different stakeholders has to be tackled with special diligence and accurateness.

Emotions and their triggers such as fear or anxiety are – if at all – difficult to measure. Thus, a qualitative approach was indicated.

5.1 Statement of Principal Findings

It was shown that the fears and anxiety related to the implementation of a national EHR among physicians in private practice in Austria really exist. The different kinds of negative emotions, anxiety, and fear related to the EHR project could be named, characterized, and described in detail. A model interrelating and integrating these fears and anxieties in order to gain a more comprehensive understanding of the genesis and development of the barriers against the EHR implementation project in Austria could be proposed.

Chiefly, the discovered negative emotions are motivated by insufficient information or a bad experience with past innovations. The physicians have no concrete idea of EHRs, and they cannot imagine

how they could benefit from EHR use and, therefore, they think that EHRs are not intended for their advantage. Therefore, they are very skeptical and quite opposed to the introduction of a national EHR in Austria.

5.2 Strengths and Weaknesses of the Study

It is clear that this small qualitative study cannot deliver universally valid and generalizable results, and the results can only be generalized concerning the existence of such fears among physicians. To use problem-centered interviews for the data collection proved to be a good choice. The physicians appreciated the possibility to articulate their points of view, uncertainty, and fears and narrated willingly. However, the answers to the study questions cannot be quantified directly.

In addition, a kind of selection bias could have influenced the results, as it could be possible that only “grumblers” and “moaners”, who wanted to express their objection, accepted our offer for an interview. This argument can be countered with the fact that all the interviewees also listed positive points, concerning modern technologies in healthcare and e-health, including EHRs, during the interviews (e.g. reduction of double examinations or that it could be easier to obtain the patient-specific results of previous findings of other health care providers). Merely these statements were not in the scope of the data analysis. By the way, it would also be possible that, contrarily, we could not motivate very strong EHR opponents to volunteer for an interview. The statement that serves as the title for our publication came from a physician who called us after receiving the interview invitation, just to tell us that he would not participate and waste his time on these useless EHRs.

There are further possible biases for the study. The study time point could have biased the results, as the interviews were conducted two months after the boiling point of the physicians’ protests against ELGA and the healthcare reform had been reached. In addition, the small geographic area from which the interviewees were recruited could have biased the study. Finally,

the fact that the qualitative content analysis was performed by only one researcher (WH) could entail a limitation of the study.

5.3 Results, Strengths, and Weaknesses in Relation to Other Studies

Change management can be considered as an established research field in the economic and social sciences. Its beginnings date back to the 1930s. Lewin’s pioneer theory [27] describing the three principal phases (unfreezing, moving, and refreezing) of change processes is still relevant. The old truth that the success of large-scale and complex IT implementation projects is highly dependent on people and organizational factors [28] was also confirmed by the results of our study.

Moreover, in the medical domain, and especially in the domain of biomedical informatics, changes have to be planned and implemented with special care as mistakes and failures can lead to severe patient harm [29]. The fear that EHRs could lead to disadvantages for patients was also expressed by our interviewees (categories 10, 14). Together with the fear of personal disadvantages for themselves (categories 3, 6, 7, 12), combined with the fear of additional start-up and ongoing cost (category 8), this can be seen as an additional reason as to why barriers against EHR implementation are likely to develop.

According to our knowledge, the present study is the first quantitative approach to assess, in more detail than the available quantitative studies, the negative emotions, anxiety, and fear related to EHRs among the settled physicians in private practice.

Simon et al. report that in a statewide survey in Massachusetts (N = 1181), the fear of start-up financial costs (84%) and ongoing financial costs (82%) were the most frequently cited barriers to the adoption of EHRs by physicians [30]. The loss of productivity and time (category 3) was ranked third (81%) in the Massachusetts survey.

Simon et al. further report that the practice size was strongly correlated with the EHR adoption rate. These findings were affirmed by [31]. We interviewed settled physicians who run their own (one-physi-

cian) practice. This could also be a reason for their negative attitude towards ELGA. Additional cost was also a fear expressed by the interviewees (category 8), but it was not a very strong topic. It seemed that the cost argument was rather superficial and the real important factors were hidden behind it, which were unveiled during the interviews.

A next interesting point is that privacy or security concerns (55%) were rated least by the physicians in Massachusetts, whereas these topics were among the top ranked categories (2 and 4) in our study. It could be possible that data privacy or security concerns are considered more important in some European countries compared to the US or other countries. This seems to be the case at least in Austria and Germany, where the citizens are sensitized concerning these issues [21]. Here, data privacy and security concerns are actively discussed and are of increasing public interest. Several NGOs and action groups deal with these issues.

5.4 Meaning of the Study: Possible Mechanisms and Implications for Clinicians or Policy Makers

Technical progress is inexorable and many problems will resolve themselves. However, some problems are too important to let nature take its course. Optimal health care is such a problem and EHRs are intended to facilitate better, quality-focused patient care.

Tang et al. state that the potential capabilities of EHRs are not adequately described in the biomedical literature yet. According to Tang et al., especially patients can benefit from EHR usage. Education and research are considered to be the clues to knock down the EHR adoption barriers among patients [32]. Speaking in market-economic terms, this means to stimulate demand. When the patients have realized that they can really benefit from EHRs, they will demand them and physicians will have to use them if they want to remain capable of competing. Despite this potential buyer’s market, there is also a potential for a seller’s market. The physicians could grab a competitive advantage by using EHRs and acting more service-oriented. Admittedly, in a

healthcare system like in Austria, which is controlled and financed mainly by the state and, therefore, does not exactly follow the market-based laws, this might not be the most efficient strategy to promote the national EHR project.

Here, it would be important to convince the physicians that EHRs are useful, and that they can benefit from EHR use. There is a chance to get the physicians on board [33]. Strategic marketing campaigns have to be included in the ELGA project. Comprehensive information campaigns tailored to the physicians' needs have to be started. ELGA has to be made transparent to the physicians. All the direct and indirect costs caused by EHRs, including required investments, start-up financial costs, ongoing financial costs, additional labor time or additional needed staff have to be quantified in comprehensive cost-benefit analysis for the physicians. On the other hand, there is a strong need to really illustrate the potential capabilities of EHRs for physicians. The fear of loss of productivity and time seems to be justified [34], but has to be put in relation. As it is not perceptible at first glance, the physicians have to learn that the efforts needed to work with new technologies are higher in the early development stages but that they will decrease significantly as time goes by [35].

5.5 Unanswered Questions and Future Research

Austria's health system is special, as aforementioned. Therefore, it would be interesting to conduct this study in other countries that run different health systems. Conducting a repetition of the study now, here in Austria, as the physicians' protest has calmed down, and conducting this study in different geographic settings would also be interesting.

In order to support the efforts to promote the ELGA project, it would be wise to conduct a similar study concentrating on the positive attitudes of physicians towards EHRs. Marketing campaigns could then rely on the discovered positive emotions and opinions. In order to substantiate and quantify the findings of this study, a qualitative large-scale survey sampling the cat-

egories described here would also make sense.

6. Conclusion

The interviews showed that the physicians are unsettled and anxious concerning the implementation of a national EHR in Austria. Education and research are considered to be the clues to reduce the EHR adoption barriers, including among physicians. The goal is to allow physicians to share in the vision of better, continuous improving healthcare, and that e-health will enable this continuous improvement, even if this implicates that we are the generation that has to put in the effort first and then the next generations will benefit from our work.

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