

# Does eHealth Literacy Impact Patients' Opinion on the EHR?

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**Abstract.** An electronic health record (EHR) will be established nationwide in Switzerland in 2020. Patients can decide on their own whether they open an EHR. It is still unclear what might influence the patient decision. For this reason, we performed an online survey among the Swiss population to study whether there is a lack of knowledge on the EHR which impacts the willingness to open a personal health record and agree to health data sharing. A questionnaire with 13 questions was distributed in a period of 4 weeks. More than 1200 participants replied to the survey. The results were analyzed with statistical methods. There are correlations between some of the questions in our survey. We conclude that the willingness to open a personal health record directly depends on the trust into the enabling technology.

**Keywords.** eHealth, EHR, eHealth literacy, health care reform

## 1. Introduction

Health literacy describes people's ability to independently search for, understand and apply health information in relation to their own health. eHealth literacy refers to this ability when information is gathered through electronic tools [1,2]. The technological development provides new tools to access health information. For example, Switzerland is about to establish the national electronic health record (EHR) in hospitals starting in 2020 [3]. People then have to decide to whom they provide access to their health data. The use of electronic aids requires certain competencies and knowledge [4]. It is still unclear, how many people in Switzerland are aware of the advantages of an EHR. In addition, there is often a lack of knowledge about legal issues with respect to the EHR and use of personal health data once it is accessible in the EHR [3]. This study analyses the current opinion on electronic health data sharing and the EHR. Therefore, we ask the following question: Can the acceptance in the Swiss EHR be increased through comprehensively communicated knowledge? Based on the question, we defined our hypotheses: 1) An informational video has a positive effect on people's viewpoint on health data sharing. 2. There is a correlation between lack of trust in electronic health data protection and skepticism about the EHR. To verify these hypotheses, we performed a survey among the population in German-speaking Switzerland.

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2. Methods

Bachelor students of medical informatics at the Bern University of Applied Sciences realized this survey. The questions based upon the questionnaire of the Swiss eHealth Barometer that aims to analyze the perception of current developments in the field of eHealth in Switzerland [4]. Our survey comprised 13 questions grouped in four topics: general healthcare system, EHR, digital data storage and data sharing. It contained questions with only one possible answer, multiple choice, Likert-type scales and one open-ended, voluntary question for feedback regarding the questionnaire itself. The Likert scale from 1 “disagree” to 4 “agree” was used. A pretest was performed to ensure that the questions are understandable and to remove redundant questions. The study was not designed to evaluate the knowledge about the Swiss EHR project. The questionnaire was distributed in Switzerland by all co-authors using the snowball system. It was sent to friends, families and acquaintances of the co-authors via WhatsApp, email or other digital media. In a second stage, the survey was distributed directly to institutions, e.g. companies or schools. Answers were collected in a period of four weeks from November 1 to December 4, 2018. No preference of gender, age or professional background was relevant for this study during the gathering of data. The inclusion criteria were German speaking subjects of legal age. Half of the co-authors distributed the questionnaire attached with a video, while the other half distributed it without video. The video introduces how security is ensured in the context of the EPD (<https://www.youtube.com/watch?v=7JMhAlbUNdU>). It is provided by eHealthSuisse, the national organization for coordinating eHealth projects. In this way, we got replies from two groups of persons, one that was watching the video before answering and the other group not watching the video. To be able to get significant results, 1200 survey answers were targeted. The collected data was analysed by descriptive statistical methods. To answer our hypothesis, we performed a statistical test to show the differences between the two groups. The statistical test was a two-sided, unpaired t-test.

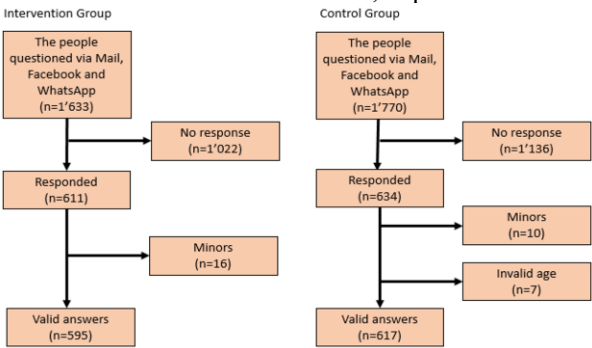


Figure 1: Response rate

3. Results

We received 1'245 answers, but had to exclude 33 questionnaires due to invalid age specifications. Thus, we considered a total of 1'212 valid answers. Figure 1 summarizes the response rate of our survey. The demographic characteristics in both groups are comparable. The main characteristics are shown in Table 1.

Table 1. Demographic characteristics

Variable	Control group (n=617)	Intervention group (n=595)
Female	311 (50.41%)	315 (52.94%)
Male	306 (49.59%)	280 (47.06%)
Age	32 (14.29%)	34 (15.5%)
Job		
Administration	56 (9.08%)	55 (9.24%)
Construction and architecture	52 (8.43%)	30 (5.04%)
Finance	44 (7.13%)	42 (7.06%)
Healthcare	130 (21.07%)	171 (28.74%)
Information technology	77 (12.48%)	54 (9.08%)
Management	32 (5.19%)	39 (6.55%)
Sales	36 (5.83%)	46 (7.735)
Industry and mechanic	43 (6.97%)	39 (6.55%)
Other	147 (23.82%)	119 (20.00%)

Table 2. Demographic characteristics [mean (standard deviation)]

Questions	Control group (n=617)	t-Test p- value	Intervention group (n=595)
1. I am interested in health care	3.13 (0.89)	0.061	3.22 (0.88)
2. Have you ever heard of the EHR before?	342 (55.43)	-	323 (54.29)
3. I am in favor of the introduction of the EHR	3.17 (0.81)	0.31	3.12 (0.81)
4. I myself would open and use an EHR	3.08 (0.90)	0.737	3.07 (0.87)
5. I would be willing to pay for the use of an EHR	1.93 (0.96)	0.16	1.85 (0.90)
6. I would agree that my health data is stored electronically	3.15 (0.88)	0.034	3.04 (0.93)
9. Health data on paper are well protected against misuse	2.47 (0.93)	0.022	2.35 (0.90)
10. Health data are electronically well protected against misuse	2.39 (0.83)	0.896	2.40 (0.80)
11. How important is it for you to be able to access your health data from home?	2.61 (0.99)	0.64	2.63 (0.94)
12. I would like to be able to decide for myself which health professionals can access my data	3.27 (0.90)	0.086	3.36 (0.83)
13. I agree that health professionals can access my treatment data across institutions (e.g. from hospital to family doctor)	3.25 (0.87)	0.0075	3.12 (0.93)

Question	Age	1	3	4	5	6	9	10
Age	1	0.160	0.030	0.020	-0.113	0.007	-0.138	-0.013
1	0.160	1	0.255	0.312	0.057	0.181	-0.064	0.028
3	0.030	0.255	1	0.718	0.172	0.663	-0.152	0.285
4	0.020	0.312	0.718	1	0.229	0.667	-0.125	0.321
5	-0.113	0.057	0.172	0.229	1	0.098	0.145	0.312
6	0.007	0.181	0.663	0.667	0.098	1	-0.146	0.324
9	-0.138	-0.064	-0.152	-0.125	0.145	-0.146	1	0.145
10	-0.013	0.028	0.285	0.321	0.312	0.324	0.145	1

Figure 2: Correlation intervention group

In Table 2, the mean value and the standard deviation per question are shown. Two questions asking for advantages of electronic health data storage and on concerns were omitted because the answer type was multiple choice. Three questions show a significant difference between the two groups (marked in green). Despite the informational video shown at the beginning of the survey, the attitude towards the EHR is almost identical in both groups. To detect the dependency between the questions, the coefficient of correlation was calculated. The coefficients are summarized Figure 2 and Figure 3.

In the intervention and the control group, the same questions showed a coefficient that was over 0.5. This proves that there is a connection between the variables. There are three questions that have a dependency among each other. Therefore, we conclude that someone who supports the implementation of the EHR is rather going to open one and rather accepts the electronic storage.

Question	Age	1	3	4	5	6	9	10
Age	1	0.073	-0.032	-0.020	-0.089	-0.081	-0.085	-0.024
1	0.073	1	0.292	0.321	0.156	0.248	-0.057	0.167
3	-0.032	0.292	1	0.743	0.271	0.607	-0.117	0.329
4	-0.020	0.321	0.743	1	0.287	0.580	-0.115	0.305
5	-0.089	0.156	0.271	0.287	1	0.205	0.163	0.446
6	-0.081	0.248	0.607	0.580	0.205	1	-0.135	0.331
9	-0.085	-0.057	-0.117	-0.115	0.163	-0.135	1	0.159
10	-0.024	0.167	0.329	0.305	0.446	0.331	0.159	1

Figure 3: Correlation control group

4. Discussion

The results only partially confirm our hypothesis. We can conclude that the informational video does not impacts the opinions. We assume, that in the video the benefits of an EHR were not addressed clear enough, and our questions were to unspecific. The correlation found between certain questions confirms that the acceptance in electronic storage has a direct effect on the willingness to open a personal health record. This is not surprising since the confidence in a new technology is one of the basic elements of its success. In regard to relevance, it can be said that this survey with an average age of almost 33 years is representative for the younger part of the German-speaking population in Switzerland. For the older age groups, no reliable conclusions can be drawn from our survey. Finally, we conclude that for a successful introduction of the national EHR in Switzerland, it is of great relevance that the confidence of the population in relation to electronic data storage is gained. This confirms the statement of Norgaard et al. that the degree of eHealth literacy is significantly influenced by the complexity of the systems and the accessibility of electronic resources [6].

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