CAPSI 2019 Proceedings

Portugal (CAPSI)

10-2019

EHR Patient Portal Usage in Portugal

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Abstract

Promoting the use of EHR Patient Portals is becoming more relevant for our society. With the increased usage of digital services to the consumers, the healthcare systems are one of the areas that demand more growth in their usage. With an increasingly older population and less healthcare resources available, the use of eHealth tools could play a critical role in the future sustainability of healthcare systems. We did a national survey, in Portugal, based on randomly generated mobile phone numbers and 8.6% of the responders mentioned that they are users of EHR Patient Portals. We also collected the usage patterns and socio-demographic information about healthcare consumers that use EHR Patient Portals. Compared with the Portuguese population they are younger, more educated and have a higher proportion of private health insurances.

Keywords: EHR; Patient Portals; eHealth

1. INTRODUCTION

The Electronic Health Record (EHR) Patient Portal is a technology that combines an EHR system and a Patient Portal where patients can communicate with their health care providers (e.g., send messages, schedule medical appointments, request prescription refills online), and access their EHR and medical exams results (Ancker et al., 2011). EHR Patient Portals are a relevant topic worldwide. In the USA, the support given to EHRs, via meaningful use program, led the USA government to commit significant resources to support usage of EHRs, not only by enhancing their adoption within the healthcare providers but also promoting the usage to the patients (Tavares & Oliveira, 2016). Not also in USA but also in Europe, investments have been done to enable patients' access to their medical information on-line. One good example was the European Patients Smart Open Services (epSOS) initiative, promoted by the EU Commission (Tavares & Oliveira, 2016). In Portugal both public and private healthcare institutions have EHR Patient Portals (Tavares & Oliveira, 2016). The most relevant governmental sponsored EHR Patient Portal is the National Health Service (NHS) Portal that in its first implementation was not very successful, but in its new release, recently launched, includes higher level of security (two factor authentication), and broader access to the patients to their clinical information (Tavares & Oliveira, 2016; Tavares, Goulao & Oliveira, 2018). Recently in Portugal, we also have good examples of investment by private health care groups, like the EHR Portal MyCuf (Cuf, 2017). There are differences between different types of EHR Patient Portals inside the same country and between countries, but the most common and frequently used

19.ª Conferência da Associação Portuguesa de Sistemas de Informação (CAPSI'2019)
11 e 12 de outubro de 2019, Lisboa, Portugal
ISSN 2183-489X

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features identified in the literature, that generally apply to an EHR Patient Portal are: management of health information and communication with health providers, medical appointments schedule, check their own EHR, and request for medical prescription renewals (Ancker et al., 2011; Angst & Agarwal, 2009; Tavares et al., 2018)

The goal of this study is to estimate the currant national usage of EHR Patient Portals and the user's socio-demographic characteristics.

2. LITERATURE REVIEW

Most of the EHR Patient Portals usage in the developing countries ranges between 5-10% of the total annual target population that they aim to reach (Gheorghiu & Hagens, 2017; Tavares & Oliveira, 2016). Most of the EHR Patient Portals are implemented at organizational or healthcare unit level, but there are some examples of National coverage EHR Patient Portals (Gheorghiu & Hagens, 2017; Tavares & Oliveira, 2016). A good example of a successful nationwide implementation of an EHR Patient Portal is the Sundhed.dk in Denmark with 1.1 million unique registered users, approximately 20% coverage of the Danish population (Gheorghiu & Hagens, 2017). Previous studies identified the users of EHR Patient Portals as younger and with higher education, than the general population, showing that these eHealth platforms are not reaching all segments of the population (Or & Karsh, 2009; Zhang et al., 2015). Also, most of the previous studies addressed only the number of registered users in the Patient Portals and being registered doesn't mean that the patient is always an active user. Plus, many of the studies didn't used sampling methodologies aiming to cover the population of a country (Gheorghiu & Hagens, 2017; Tavares & Oliveira, 2016; Zhang et al., 2015). Understanding the socio-demographic patterns of the users of EHR Patient Portals and the actual usage coverage at country level, is relevant to identify potential digital divide and low usage coverage. By knowing these details appropriate policies can be implemented to increase EHR Patient Portals use.

3. METHODS

3.1. Measurement

The questionnaire was delivered in Portuguese. Usage features were measured on a seven-point range scale, ranging from "never" to "every time I need", since EHR Patient portal usage is not expected to be as regular as other IT consumers technologies and the patients only use them when they effectively need. What is relevant to measure is if when patients need, they use EHR Patient

Portals and not other options. Socio- demographic questions were also included. Age was measured in years and gender was coded as a dummy variable (0 or 1), with women represented by 0. Having a private health insurance was also coded as a dummy variable (0 or 1), with its absence represented by 0. Information about the level of education of the respondents was also assessed, with three different layers (university degree; high school education complete; high school education incomplete). Additionally, respondents were asked if they had a chronic disease or a medical incapacitating situation. It was also coded as a dummy variable (0 or 1), with its absence represented by 0.

3.2. *Data Collection and Analysis*

Because the main goal of our study is to determine the usage prevalence rate of this type of technology, we sub-divided our survey into two phases. One of the problems with surveys via telephone is that people are not willing to spend time in answering them (Vicente & Reis, 2009). Two-phase sampling designs are commonly used in epidemiological studies, when a disease is rare and diagnosis of the disease is difficult or expensive (Gao, Hui, Hall, & Hendrie, 2000). In the first phase a bigger random sample from the targeted population is screened with less intensive and expensive screening. In the second stage a random sub-sample of the individuals is studied more intensively (Gao et al., 2000). We used a similar approach, but in our case the aim is to handle a potential high non- response rate. Specifically, our population of interest is the Portuguese adult population (age ≥ 18 years) who are users of EHR Patient Portals. In the first section, we asked the potential respondent if she/he was a Portuguese adult, if the response was positive, we asked if she/he was a user of EHR Patient Portals and only after (if she/he was a user), about her/his interest in replying to our main survey.

To interview our target population, we used a mobile phone survey. Approximately 95% of the Portuguese adult population have a mobile phone (ANACOM, 2016), making it a valuable methodology to conduct this survey due to its high coverage of the target population. The survey was computer assisted and all answers were immediately recorded. The mobile phone sample was comprised of randomly generated numbers. The Portuguese Telecommunications Regulation Authority (ANACOM) delivers information concerning the market share of the three operators offering mobile services in Portugal (ANACOM, 2016). This was used to split the sample into three mobile subsamples proportional to the market share (Aanerud, Braut, Wentzel-Larsen, Eagan, & Bakke, 2013; Picot et al., 2001; Vicente & Reis, 2009). Within each two-digit prefix of the three operators, numbers were created by a generator of 7 digit random numbers (Vicente & Reis, 2009). Up to additional four call attempts were made to each number in order to establish contact, with the exceptions when the number was identified as non-working or not attributed (a message from the

operator provides this information) (Aanerud et al., 2013; Vicente & Reis, 2009). The survey took place between July 25th, 2017 and October 15th, 2017. All study participants were informed about the research purpose, confidentiality protection, and the anonymity of the information collected, and that by answering all the questions they were giving their consent to participate in the survey. In total, we obtained 15080 valid numbers. Figure 1 provides the description of the sampling approach and the results.
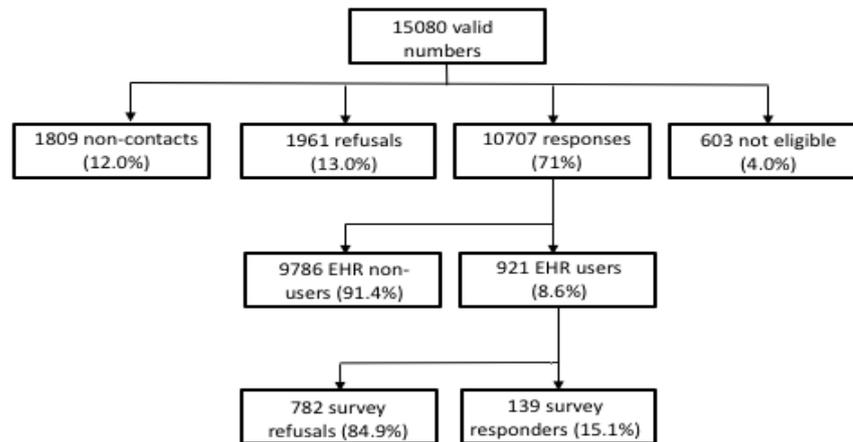

Figure 1 – Sampling procedure and results. The first phase of the survey achieved 71% of responses allowing the estimation of the actual usage of EHR Patient Portals. Only, 15.1% of the users accepted to provide additional socio-demographic information and usage details (second phase of the survey).

To perform the statistical analysis of our sample results we used the statistical software SPSS 21.

4. RESULTS

Our sample characteristics results compared with the Portuguese adult population are displayed in Table 1

	Sample (%)[b]	Population (%)[c]	
Age			*P <0.01[a]*
[18-34]	48.20	25.92	
[35-49]	41.70	27.35	
[50-64]	5.80	23.51	
≥65	4.30	23.22	
Gender			*P=0.814[a]*
Male	46.00	47.04	
Female	54.00	52.96	
Private Health Insurance			*P <0.01[a]*
Yes	56.00	25.10	
No	44.00	74.90	
Education			*P <0.01[a]*
University Degree	63.31	18.21	
Non- University Degree	36.69	81.79	

Notes:
1. [a] χ^2 test ;
2. [b] Sample size (n=139);
3. [c] Portuguese Census 2011 adult population (n= 8,657,240)

Table 1 – Sample characteristics versus target population

The age groups and the gender of the target population use as a source the latest Portuguese Census data from 2011 (INE, 2011), the level of education uses as a source the latest inquiry from the National Institute of Statistics in 2016 (Pordata, 2016), and, for the number of people with private health insurance in Portugal, the information from the Portuguese Association of Insurance Companies from 2016 (Mateus, Ramalho, Oliveira, Rodrigues, & Ferreira, 2017). Except with the case of gender, all other sample characteristics differ from the target population. We should not generalize these results as representative of the target population due to the high non-response rate in the second phase (Figure 1). Early adopters in eHealth are usually younger and more educated than the general population, in line with the findings of our study (Or & B. Karsh, 2009; Zhang et

al., 2015). Higher income is also related with eHealth early adopters, which may justify the higher percentage of people in our sample compared with the target population, with private insurance (Or & Karsh, 2009; Zhang et al., 2015). In Portugal, there is a National Health System that provides coverage to all citizens, but there is a substantial increase in the last decade of people obtaining complementary private health insurance (Bohm et al., 2013; Jhamb et al., 2015; Mateus et al., 2017). In Portugal the main private health care institutions have also implemented measures to encourage the use of eHealth tools, including EHR Patient portals (Tavares et al., 2018). Regarding the existence of chronic disease, only 9.4% (n=13) of the respondents in our sample reported having it. A recent study in Portugal reported that 57.8% of people with age between 25-74 years have a chronic disease (Quinaz Romana et al., 2019). The age overlap between our study and the study reporting the chronic disease results in Portugal is not the same, but with a younger population than the national average, our sample also have lower proportion of people with chronic diseases.

According to the results in the first stage of our inquiry, 8.6% of the Portuguese adult population uses EHR Patient Portals. This value is within the range of 5-10%, most commonly reported in the literature (Gheorghiu & Hagens, 2017). We obtained a response rate of 71% at the first stage. In the case of our survey we cannot assume that the non-responses are "missing at random," and hence their lack may lead to bias (Altman & Bland, 2007; Powney, Williamson, Kirkham, & Kolamunnage-Dona, 2014). According to the literature the ideal value for responses in a survey should be greater than or equal to 80%, to make assumptions about the results and if they are representative of the population (Altman & Bland, 2007; Evans, 1991). The types of non-responses in our survey are included in Figure 1. They include 4% of individuals who were non-eligible, mostly because their age was lower than 18 years. Overall and according to other surveys in general and surveys for populations of low prevalence, our response rate may be regarded as reasonable (Aanerud et al., 2013; Kalton & Anderson, 1986; Picot et al., 2001; Vicente & Reis, 2009).

	Average	Median	Minimum	Maximum
UB1	4.37	5.00	1.00	7.00
UB2	4.75	5.00	1.00	7.00
UB3	4.56	5.00	1.00	7.00
UB4	3.34	3.00	1.00	7.00

Notes: [a] UB1= Management of personal information and communication with health providers; [b] UB2= medical appointments schedule; [c] UB3=Check their own EHR; [d] UB4= Request for medical prescription renewals;

Table 2 – EHR Patient Portals usage patterns

The usage patterns reported in Table 2 show a good adoption and usage by the users. The feature with the least usage is the request for medical prescription renewals; our sample is relatively young (mean age=36.0 years). The request for prescription renewals is usually related with chronic

conditions that are more prevalent amongst older people (Osborn et al., 2013). We additionally tested our sample using the Mann–Whitney U test to check if gender, presence of university degree or chronic disease, would have any impact in the usage patterns of EHR Patient Portals, and none had a statistically significant impact. To assess the influence of age in the usage of EHR Patient Portals we used the Spearman's correlation test and we had two positive significant correlations, although weak, in UB2 (r_s=0.257; *P<0.01*) and UB4 (r_s=0.246 ; *P<0.01*). At least for UB2 and UB4 it makes sense that older people have more need for medical appointments and for renewals of medical prescriptions.

5. LIMITATIONS AND FUTURE RESEARCH

Unfortunately, our study had a very high non-response rate concerning people that refused to answer the main questionnaire. With this high non-response rate it is difficult to make direct assumptions related with the users in the Portuguese population. Nevertheless, earlier literature indicates that users and early users of eHealth tools and EHR Patient Portals are younger and more educated than the population average (Or & Karsh, 2009; Zhang et al., 2015), in line with our study findings. The results presented in this study are part of on-going research that will evaluate more deeply the reasons and the drivers for the adoption of EHR Patient Portals. Still limited these results are important to be known because they provide a first overview of the characteristics of the EHR Patient Portal users and the usage prevalence in Portugal.

6. CONCLUSION

Although acknowledging that we had a very high non-response rate at the second phase of our sampling procedure, the much lower non-response rate at the first phase provides an estimate of 8.6% usage of these types of platforms in Portugal, a valuable contribution from our study. Our respondents demographics follow the same trend as reported in other similar studies in the literature (Or & Karsh, 2009; Zhang et al., 2015), providing additional support to our findings. Even with the sample limitation of this study, it is relevant to highlight that the prevalence of self-reported usage is still low. The fact that we have a higher proportion of people in our sample with private health insurance, may point-out that the current measures from some private health care institutions to promote the compulsory use of EHR Patient Portals (Tavares et al., 2018) is probably driving their usage. The lower than the average age in our sample versus the Portuguese population and the low percentage (9.4%) of people with chronic disease that use EHR Patient Portals suggest that the ones that could have more benefit of using EHR Patient Portals are not using it as they should.

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