On the Attitudes of GPs toward Novel Features of their next EPRs

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Abstract. In this paper we report the findings from a CATI-based survey that involved a representative sample of General Practitioners in Italy. Respondents were asked about their use of ICT in keeping in touch with their patients; their adoption and actual use of their Electronic Patient Record (EPR); and, more importantly, their perception of usefulness of a series of novel functionalities that could enrich the next generation of EPR in general practice.

Keywords. Electronic Patient Record, General Practice, GP, CATI, User Attitudes

Introduction

An apparent paradox seems to emerge when comparing recent evidences of the advantages of Electronic Patient Records (EPRs) in General Practice [1] with similarly recent researches reporting that almost 25% EPR users are low-users, i.e., users that exploit just a small proportion of the available functionalities [2]. This happens also with respect to so called "innovative" EPRs and their more advanced functionalities, which only 1 user out of 2 exploits [3]. Many reasons can be behind this phenomenon [4]. One simple approach relates this matter to the finding at the basis of the Technology Acceptance Model [5]: actual use of a system correlates much more with perceived usefulness than with ease of use: this has been proved true also for the medical domain [6]. Thus, one possible key for the paradox mentioned above invites to consider whether what is innovative and value-bringing for ICT vendors is also perceived in the same way by users, and more specifically by General Practitioners (GPs). In this paper, we report the findings coming from a computer-assisted telephone interview (CATI) that involved a representative sample of Italian GPs. We undertook this survey with a twofold aim. On the one hand, we aimed to put "a finger on the pulse" of Italian GPs and get a picture of their current level of digitization, so as to enable comparison with other countries, e.g., [7,12]; on the other hand, and more importantly, we wanted to probe the GPs' attitude toward the prospective adoption of innovative elements (models and functions) of patient records supporting their daily work. This latter element makes the contribution original and a sort of forerunner experience for the collective elicitation of requirements from large communities of potential users and to get general indications for vendors and policy-makers regarding what aspects of eHealth are valued by the grassroots level and which ones to invest on for the sustainable innovation of the field.

1. Method

In Spring 2011 we conducted a survey involving 1.260 general practitioners, i.e., the 2.9% of all GPs in Italy (43.932 in 2010). The sample was randomly extracted and stratified by region of residence to represent the whole population of Italian GPs. A structured questionnaire was developed and pilot-tested with 3 GPs that gave due feedback to revise the content and structure of the interview. These practitioners were also involved in a focus group that encompassed 3 academic researchers involved in Medical Informatics and 2 senior ICT consultants from the eHealth private sector; this focus group was aimed at selecting 10 innovative functionalities that could be conceived and evaluated for the EPR of the future. Candidate solutions were progressively discarded and refined as a compromise between innovativeness, reasonable feasibility, and a sort of familiarity of GPs with the concepts involved¹. Likewise, after long discussion, we decided not to ask GPs whether they appreciated their current EPRs or not (or gauge their satisfaction); since our focus is on prospective functionalities irrespective of current implementations, the rationale for this omission was not to bias the respondents' perception of value in terms of improvements of their specific electronic tool. Rather, an indication of actual appropriation was probed and extracted from the respondents' sample in terms of frequency of use.

The questionnaire was administered through a CATI system to avoid problems such as missed questions and out-of-range responses. Specifically trained and supervised operators of a specialized laboratory of applied sociology carried out the interviews in three days in March. The length of the interview averaged approximately 9 minutes to minimize fatigue bias. Each interview began with a brief description of the scope and aims of the initiative followed by a few questions of profiling (i.e., years of experience, specialty, connectivity). Then respondents were questioned about what technology (if any) they used to discuss health problems with their patients among phone, fax, emails and social computing platforms; and whether and when they were using an EPR in their examinations. They were also asked about their attitude toward different models of managing and presenting patient data. Finally, they were asked what their expectations and perception of value were regarding a set of innovative functionalities to endow an ideal EPR with in the next 5 years. The results were tabulated and analyzed with SPSS[®] (v. 17). A chi-squared test was used to examine the differences between ordinal variables. The Randolph's free-marginal multirater kappa was used to assess agreement between the respondents [8].

2. Results

43.6% of eligible GPs could not be reached either because the contact info was wrong or because they had moved, retired from practice, or had been long term absent. The 68.4% of the contacted GPs either refused to undertake the interview after the description of the research or were not reachable at the second phone appointment set when they had been found busy at first. Thus, we could conduct 225 complete interviews (32% of the contacted population, 18% of the overall target population). We assume that non response bias is negligible here for our aims, as we focus on probing

¹ For this reason, functionalities known as eSignature, ePrescription and eBooking were considered at first and then discarded from the interview.

the general attitude of interested ICT users toward novel functionalities; therefore, the response rate allows us to reach a confidence interval on all response proportions of 6.5% at a 95% confidence level, which is acceptable to our aims.

In regard to the sample profile, 64.4% of the involved GPs had 20 or more years of experience in the field. 64% had a specialty (of which 72% a medical one). 85.8% worked in a consulting room connected to the Internet; of these latter the large majority (85%) had a broadband access to the Internet. When asked if they would agree about the creation of a public register that would allow citizens to know what ICT-based services they would be able to provide, 61% of the involved GPs agreed (28% very much), while 36% expressed their opposition to this initiative².

In regard to what ICTs GPs use to treat health-related matters with their patients, phone is the technology more used (82.2% use it often; 11% sometimes, 6.6% seldom or never); in regard to text-based media, the 25.4% use the fax *at least* sometime, against the 33.3% that exchange emails with patients (to discuss health-related problems) *at least* sometime (11.1% often). Notably, to this same aim the 14.2% of GPs have already used Social Computing (SC) tools like Instant Messaging, Facebook or Forums ³ (2.2% say to use SCs often). Generally GPs are fine in regard to how often they use ICTs. Yet, the 45.3% wish they could use phone *less* frequently; 30% wish they could use emails *more* often: these are then more than threefold more numerous than those who would like to use emails *less* frequently (i.e., 29.8% vs. 8.4% of the respondents); likewise, 12% of the respondents said to wish to use social networks more often (again, to interact with patients about their health). Notably, if we consider just those who said to use SC tools at least sometimes, 60% of these said also they would like to use such media *less* frequently.

In regard to the GPs' level of digitization, 96% of the respondents said to use an Electronic Record ⁴. Interestingly, GPs tend to underestimate the level of digitization of their professional category: 77.3% of the interviewees thought that less than 90% of GPs in Italy are currently using an EPR (half of the respondents even thought that only 3 GPs out of 4 were connected to the Internet).

Of those who claimed *not to have* an EPR, 25% of them said that they would need one; the price of EPRs currently available is allegedly not a problem for almost 90% of those who do not own one; rather, 50% of these latter are afraid they would not be able to use this kind of application. Interestingly, 25% of these non-users declared to have all their patient data digitized in some electronic format (like in spread sheets, simple databases and the like).

Of those who use an EPR regularly, 84% use it during the visit with the patient; a slightly smaller number use their EPR just before (59.1%) and immediately after (58.7%) each visit. Interestingly, almost one GP out of 10 (8.9%) claims to use her EPR seldom or never. When asked what model of information management and presentation GPs would prefer to organize their records, a large majority (88.4%) were better inclined towards the traditional sectioning (e.g., identification, patient history, progress notes, test results); yet, also the problem-oriented model and the time-oriented models [9] were found to be appropriate (84% and 80% of GPs respectively) as an alternative way to structure patient data.

² This attitude was not dependent either on the years of experience nor on being specialized (Z value = -1.1779; two-tailed p-value = 0.2388).

³ These examples were suggested when asking this question.

⁴ This is in line with other National surveys, Cf. Sole 24 Ore Sanità (2011) No. 19.

In regard to the attitude toward prospective functionalities, i.e., the focus of this paper, we report the results in Table 1: respondents were asked to rank the perceived value of each functionality on an ordinal scale from "high value" (+2) to "no value" (-2). In Table 1 we report the option chosen by the relative majority of respondents and, when different, the median as an indicator of central tendency of the response distribution. We have also aggregated the responses related to either a positive attitude ("high value" "moderate value") or a negative one ("low value", "no value") and report the proportions of response for the former category in the rightmost column.

Table 1. Perception of value for each functionality is expressed in terms of ordinal categories: High, Moderate, Low, No value. Favourable attitude is indicated in terms of the proportion of respondents that assigned an either high or moderate value to the functionality.

Prospective Functionality	Perceived Value ⁵	Favourable Attitude ⁶
A) Automatic Reminders and alerts for the distributed follow up of patients requiring periodical monitoring.	Moderate	93.9%
B) Manual annotation and free-text commenting of any field/image in the record forms.	Moderate	88.4%
C) Automatic synch between personal organizers and the patient appointment calendar.	Moderate	54.7%
D) Alerts, notifications, document-routing driven by evidence-based care programs/protocols.	Moderate	75.2%
E) Automatic extraction and analysis of patient data to feed in a dashboard of clinical outcomes and other indicators.	Moderate	79.3%
F) One-click creation of regional policy-compliant reports for peer audits and regional governance programmes.	Moderate	75.8%
G) Capability to get full access to scientific papers that are pre-selected on the basis of the available patient data.	High	94.6%
H) Integration between the EPR and the patient Electronic Health Record (e.g., import identification data, discharge letters and test results)	High	84.1%
I) Capability to import into the EPR (and keep synced) selected (threads of) emails and interactions on social network with patients and colleagues.	High^7	51.6%
J) Support for 'Second Opinion' consultations with colleagues and specialists to cope with complex cases.	High	90.5%

3. Discussion

According to our survey, almost 1 GP out of 10 does not use her EPR at all, leave alone at its full potential. This indication tarnishes the common picture of very high EPR "adoption" within the Italian GP category. This urges toward the conception of new EPR functionalities that are perceived by intended users as valuable for their practice beyond those related to the mere storing/retrieval of patient data. One of the key can be found in the strong historical associativism of GPs: almost 8 GPs out of 10 work together in some form of collaboration. Indeed, the most appreciated functionalities

 $^{^{5}}$ Null hypothesis on the equal distribution of responses among the ordinal categories are rejected with P-value < .001 for all the functionalities considered.

⁶ High level of inter-rater agreement is detected for option A and G only (kappa > .7)

⁷ The Median value is 'Moderate', due to the relatively high number of "little" or "no value" responses.

were those related to the concept of "networked healthcare" [10]: support for the "second opinion" service and to refer cases to peers and specialists (see J in Table 1); aggregation of written interactions from external systems (see I); integration with the Health Record of each patient, which is a shared resource among heterogeneous stakeholders and caregivers (see H); and visibility and reminding of events related to necessarily distributed and log-term care pathways (see A). This is also reflected by functions A and J (see Table 1), that received the most favorable attitude (after item G); in particular, respondents reached a high consensus in regard to item A. Moreover, we found that 1 out of 7 GPs (in upward trend) use social networks to interact with their patients, while 1 out of 3 GPs would like to use email more often in the next future, probably at expense of the more volatile and interrupting phone talks. This is sort of countertrend with respect to the often reported problem of having practitioners cope with (and often yield to) the ever increasing amount of information available in electronic format [11], which is also reflected in the highest value recognized by most of the GPs for item G. Yet, here we see that GPs reconsider the information generated within situated interactions with colleagues and patients (e.g., in emails, private chats, forum replies) as a valuable asset and not as a source of overload, once it has been stored and reported in a contextualized form within the pertinent flow of "data" they access for a specific patient (cf. the appreciation for timeline-based models). In the same vein, the interest for item B, (i.e., adding personal annotations to any element of the forms), can be considered as a requirement to "appropriate" the record and to enrich clinical "structured" data with informal content, which makes sense only in a context that encompasses previous conversations as well as extempore side notes. Overall, thus, the functional requirements the survey results hint at suggest to invest on an idea of EPR that takes on supporting collaboration among the many stakeholders involved natively, and that contributes in creating a network of members of a "community of care" out of a mere network of interconnected software systems.

References

- [1] Holroyd-Leduc JM, et al.. The impact of the electronic medical record on structure, process, and outcomes within primary care: a systematic review of the evidence. JAMIA 2011;18:732–7.
- [2] Simon SR, et al. Physicians' Use of Key Functions in EHRs from 2005 to 2007: A Statewide Survey. JAMIA. 2009;16:465-70.
- [3] Linder JA, Rigotti et al. Clinician characteristics and use of novel electronic health record functionality in primary care. JAMIA 2011
- [4] Simon SR, Kaushal et al. Physicians and Electronic Health Records: A Statewide Survey. Archives of Internal Medicine. 2007 12;167:507–12.
- [5] Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly. 1989;13(3):319-340.
- [6] Spil T, Schuring RW, editors. E-Health Systems Diffusion and Use. IGI Global; 2005.
- [7] Christensen T, et al. Norwegians GPs' use of electronic patient record systems. IJMI 2009 Dec;78(12):808-14.
- [8] Warrens MJ. Inequalities between multi-rater kappas. Advances in Data Analysis and Classification. 2010;4:271-86.
- [9] Hayrinen K, et al. Definition, structure, content, use and impacts of EHRs: A review of the research literature. IJMI 2008;77:291-304.
- [10] Koop CE, et al. Future delivery of health care: Cybercare. IEEE Engineering in Medicine and Biology Magazine. 2008 Nov;27:29-38.

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- [11] Andrews JE, et al. Information-seeking behaviors of practitioners in a primary care practice-based research network (PBRN). J Med Libr Assoc. 2005;93(2):206-12.
- [12] Morris L, et al. A survey of computer use in Scottish primary care. Inform Prim Care. 2003; 11(1):5-11