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Health Portals for Specific Populations: A Design for Pregnant Women

Sommer, Janine[a]; Daus, Mariana[a]; Simon, Mariana[a]; Luna, Daniel[a]

[a] *Department of Health Informatics, Hospital Italiano de Buenos Aires, Argentina*

Abstract

The technologies and communication advances, contributed to new tools development who allows patient to have an active role in their own health. In the light of paradigms changes and information needs about health, the patient self-manage their care. This line of care focuses in patient, specific portals come up to people with particular requirements like pregnant womens. Thinking in a portal design to this sector of the population, in September 2016 a survey was made to users with the objective to knowing and understanding information needs at the moment to use a pregnant's app . Also, prototypes of the portal's features was designed to try and validate with users, using the human-centered design methodology. Investigations have made possible the identification of this population's needs and develop a tool who try to satisfy, providing timely information for each part of pregnancy and allowing the patients to make a physical check and to follow up pregnancy seeking advices from our obstetricians.

Keywords:
Pregnant Women; Health Personal Record; Mobile Applications.

Introduction

The pregnancy is a time in the life where the patients feels the need to look information. Women often search information about conception, maternity, their current or future pregnancies because they don't have the experience or want to share it; besides, they look for a medical advice and to feel connected. The electronic media like Internet, provide easily and optimal access to the information that the user search, on this days [1]. The progress in technologies linked with information and communication, in addition to society needs are very sensitive to the use of technologies, contributed to new tools development who allows patient have an active role, emerges electronic portals to them, where self-manage their care. These provide us a control sense and responsibilities of the own health and a quickly access to the health and administrative information [2].

To determine the information need and properly app design, an australian survey published in biography was taken and adapted [3], where investigate about the information they was looking for and what kind of mobile apps they used during this phase. From this view, this study was very important, because usage patterns were identified and the need of apps in pregnant women, and others aspects that need to be taken into account were clarified. We take this result like as a basis to our own application development and we adjust it to the women's needs.

Also, prototypes of the portal's features was designed to try and validate with users. We take into account that a good design should be understandably, friendly, intuitive and easy to use. It must be adapted to the user needs, abilities and objectives. To ensure that this design implement the requirements we worked under methodological framework known as Human-Centered Design (HCD). This overview provides that the stages of "design", "prototype" and "evaluation" must be cyclic and itinerant, everything that is design must be evaluated through it's prototyping constantly, to correct usability mistakes, since is more cheaper reorient a design than redesign a new development [4].

Find a specified section destined to bring relevant information for the pregnant is the app goals, where since the conception we can do a joint accompaniment by the team, moments that she considered important like a "pregnancy diary". In this context, an exclusive app to pregnants inside the Personal Health Records (PHR) was decided to implement at the Hospital Italiano de Buenos Aires (HIBA) ; from which the patient can have an active role, know at any time their health information and to access to many service from Hospital. The app access inside the PHR, provides confidence to the patient that the content of health have based in scientific knowledge [5].

In order to have a reference about population to be able to design this app and validate the design of pregnant women module in PHR, surveys and proves was made with users.

Setting

Hospital Italiano de Buenos Aires,, Argentina, it's a highly complex institution with 150 years of history. It's a school hospital who cover the health care since outpatient services, emergencies, acute inpatient service, surgical and medical specializations, intensive care, home and chronic patient care.High state of the art technologies are used in diagnosis and treatment studies. The informatical development from each one has been made by own initiative, which brings many platforms, vocabulary and communication mechanisms. An own Health Informatic System (HIS) is designing and building Since 1998 by the Institution, linking the diversity and variety of developments that was developing at the same time inside the hospital; both in administrative as an assistance way. This was incorporated in a growing numbers of user that currently involves administratives, medicals and nursery [6].

The Hospital developed the "Personal Health Records" during 2007, a web tool that record personal medical history and offer access and services to a database in many apps. It allows interact or ask about clinical or administrative information to

the patient in the Hospital's network. Self-manage and check their evolution are the patient's goals. The new personal health records serves not only for these necessities, also allows the fluid and instant communication with the professional. To this end, takes advantages about modern technologies possibilities and new ways of users communications [7]. It's available at web version for mobile devices and desktop . The personal health records was redesigned in two times (2012 and 2016) in order to improve the user experience and add the latest in technology to the web app development. The user's needs and the technological advances derived in a process of redesign in which having been upgraded the interfaces, reorganized functions and has implemented the responsive functionality: the adaptability to any device.

Currently has more than 360 thousand certified users. Among the functionalities, it's possible to view studies results, make an appointment, chat with the primary care physician, patient's medicines list and buy this stuffs at the hospital pharmacy and receiving in their home.

Methods

In September 2016, a survey was show in social medias to take information about the pregnant needs. To determine the information need of these people an Australian survey was take, which was reflected at spanish and shared in social medias: facebook, twitter and email. They were obtained 235 answers between 08/09/2016 and 27/09/2016.

Tests for usability by using high fidelity prototypes realized on the InVision platform from all the portal screens of the pregnant, were made at the same period. We come to the waiting area in the Center of Children and Women from HIBA to test them at the computers.

6 pregnant women interacted with the platform (table 1), it was made by the usability test that the Informatic Health Department use with users; comments, interviews and surveys were made to test the task flow and the pregnant users. We made test to real users asking them to think aloud and navigable links insides to PDF were used, even html model developed from sources we had and the process context, where the goal was to evaluate these prototypes. Inquiry items about the topic were made (table 2).

Table 1 - Actions who pregnant should do during the test

Usability Test
Identification of the timeline 1
Identification of the timeline 2
Identification of the timeline 3
Upload a picture
Upload a note
Announce the arrival of the baby
To share the arrival of the baby in social medias
Identify the contraction counter and how it use
Identify each stage of pregnancy
Identify the pregnant advance
Identify where can search for more information

Table 2 - Information about users that participated the test

Information about the pregnant
Age
Week of pregnancy
Education level
Ocupattion
Knowledge about the Personal Health Record
Registration on the Personal Health Record
Use of technologies
Pregnant app download
Search information about pregnant
Data security
Interest in sharing news about your pregnancy in social networks

The administrative areas from the Hospital and physicians collaborated to recruit users, considering that many times they were the ones who send them after the obstetric consultation. The acceptation and a greater reliability to to the system use by patients, were build because of that.

Results

The test could performed with 6 differents gestation stage's users, which provide us different information about the needs depending on the pregnant time. The average age from patients was 30 years and for 67% were their first pregnant. The 6 pregnant women know the Personal Health Record and only 1 wasn't registered. The 17% have a good use of technologies and the rest of them use just what is needed. With regard to information security, a high proportion don't know if the information they read on internet was reliable; in relation to sharing information about their pregnancy, a majority said their want to do it with their close friends and family.

On the other way, the surveys were answered in a high percent only by pregnants and mothers with children under 12 months (83.4%). The 50% had used only 1 app during their pregnancy, the other 50% used 2 or more apps. The 92.1% of participants had found useful functionalities inside the app they use. In terms of the security and confidentiality, 75% didn't check where health information show was take out. The rest of the results shows on the table 3.

Table 3 - Survey results

Survey	Percent (n=)
Age	
25-30 years	26.8% (63)
31-34 years	29.4% (69)
35-40 years	**29.8% (70)**
Nationality	
Argentine	**97.44% (229)**
Others	2.56% (6)
Education Level	
University graduate	**23.8% (56)**
University undergraduate	23.4% (55)
High School complete	18.7% (44)
Specializing	16.2% (38)
Postgraduate	11.9% (28)
Use of apps to pregnancy	
YES	**64.7% (152)**
NO	35.3% (83)
Frequency of use	
Often	**40.1% (61)**
Most of the time	28.9% (44)
Sometimes	25% (38)
Most used functionality	
Information about fetal development	**90.1% (137)**
Information about corporal changes	63.2% (96)
Control of weight gain	15.8% (24)
Forum to discuss	23.7% (36)
Reminders of turns and studies	9.2% (14)
Keeping a pregnancy journal	23% (35)
Upload and save pictures	12.5% (19)

Discussion

We previously investigated another experiences using mobile apps to the pregnants mobile app development located inside the Personal Health Record. Finding the survey in Australia who above to the same search objective, we decide to implement adapt it on our context to take off conclusions and have a guide at the time of functionalities app creation. We could take out important data to the app design: if they used mobile apps for the pregnancy, more used functionalities, importance they give to the source information, or if they ask who access and where the data is store. This apps cover a range of items connect with mother and fetal health, from pregnancy general information to specified information, like a healthy weight gain during gestation. In so many ways, their number and popularity suggests that is a significant demand of information [8].

The Personal Health Care are tools that offered resources to self-manage their health and drives information to the patient. Some studies refer that the low adoption could be linked to the way that they are design. For example, most of portals are oriented to the professional and don't consider the way that patient prefer the functionalities. The positive influence in the behavior of patient's health depends on the usability of the portal; their perspective must be considerate and integrated at the moment of design [9]. If patients find on Portal relevant and useful information, this tool can become in a integral element on their live. The design concept center on the user, contributes to the evolution of portals to a significant criterion, increasing utility and value to them [10].

Considering that had a good use of technologies only 17% of survey pregnant, and the rest of them used only what is needed, can be considered as a kind of digital gap or a barrier to the tool use. Literature talks about portals adoption's challenges, like accessibility, internet use, ease of use and the type of device used [11] looking for a wide variety of strategies to face these issues.

Another constraint to the study could be that the data is not generalizable and couldn't countered to other populations. It would be necessary relieve which kind of information women needs, it could be different cultures or nationalities and adapt intervention in function of that.

About the test performed, it's what literature's recommended: testing only 5 users, 80% of issues are visible, while the test development, as they add more users, it's discovered each time less, because it's keep watching the same performances one and over [12]. After fifth user, the same findings are observed. It's better to make many little proves instead only one complex study, where is going improving and roaming in based of the trouble detected, [13]. We did not find similar experiences at South America respect this point, and this make us understand why even if it shows that mobile apps drive information to the pregnant and empower, [13,14] there are lack of research and evidence in our population context.

Conclusions

About surveys investigation and the usability test with pregnants, we could have the necessary information to develop an specified Personal Health Record to the pregnant women inside the Personal Health Record from HIBA. We could identify the needs and develop a tool that try to keep satisfied this needs. The development team from Health Informatic Department from HIBA and informatical health specialists worked on a module to pregnant patient connected to the Personal Health Record and electronic record that have work over 10 years. This allow to get a tool that gave timely information to each stage of pregnant and to be empowered and to control their pregnancy taking the obstetricians advices. The portal from HIBA for pregnant is currently at the last stage of develop, in the process to be implemented on November 2017.

Figure 1 – Pregnancy Portal

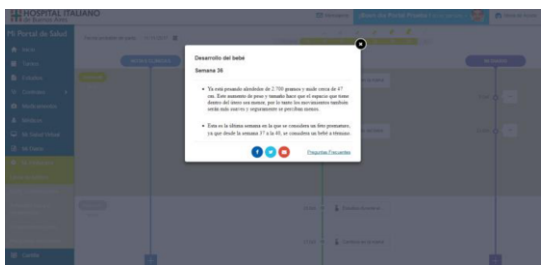

Figure 2 - Notice viewing about fetal develop

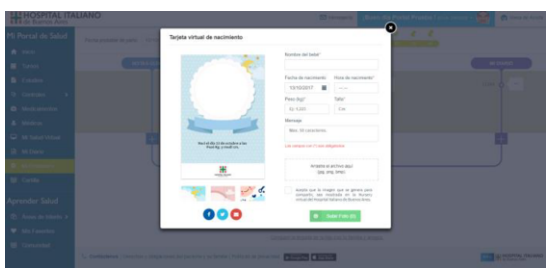

Figure 3 - Card made to share in social medias

Figure 4 - Direct access to pregnancy information

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Address for correspondence

Janine Sommer – Email: janine.sommer@hospitalitaliano.org.ar