Smartphone subscribers and healthcare apps in Iran

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ABSTRACT:
This study is concentrated on the use of health care apps among smartphone subscribers in Tehran1. These apps are divided to 3 categories; Pharmacological applications, Dream meanings applications and Diet applications. . The survey method with sample of 384 students is administered in this paper. Analysis of the findings indicates that there is a significant relationship between gender and different types of healthcare apps which subscribers use on their smartphones.

KEYWORDS: Smart phone, Healthcare apps

1. INTRODUCTION

The Internet has unquestionably changed the flow of health information (Cassell, Jacks and Cheuvront, 1998; Suggs, 2006). Due to important role of the Internet as an important source of medical information, medical advice and online support groups, the Internet is making it possible for patients to assume much greater responsibility for their healthcare.

Traditionally, the relationship between the physician and the patient is out of balance, as the physician has better access to information and more experience than the patient.

But the Internet is changing this dynamic. It provides advice on health and medical problems both on the web and over the cell phone2. At the end of 2010, there were a total of 67.5 million cell phone subscribers in Iran, equivalent to a penetration rate of 91 percent, according to BMI Iran Telecommunication Report3 . Adoption of smartphones 4 in Iran hovers around 35 percent. The uptake of this technology is rapid. Smartphones are increasingly used to track illness and promote wellness. The topic of smartphones in health is an intersection of two fast-evolving ecosystems: Health and Technology. It is so intuitive and user-friendly that most smartphone subscribers can download and use many available applications-or apps- without any special knowledge in different scientific fields (Sara sohn-Kahn, 2010).

The creation of applications related to health and health care is also moving quickly. Apps geared to physicians include alerts, medical reference tools, diagnostic tools, continuing medical education, and patient records programs.

Consumer-oriented apps include those for medication compliance, mobile and home monitoring, home care, managing conditions, and wellness/fitness (Sarasohn-Kahn, 2010).This study is concentrated on the use of health care apps among smartphone subscribers in Tehran5. These apps are divided to 3 categories; Pharmacological applications, Dream meanings applications and Diet applications.

To the best of our knowledge, this study is the first detailed research of health apps in Tehran. In order to present the results f this investigation in a useful fashion, this short paper first discusses related works in this area briefly. Moving on, the paper describes the 3 hypotheses explore in this study. Then we describe the research method, participants and the research procedure.

The two subsequent sections discuss initial findings and detailed analysis respectively. The next section states conclusion and makes recommendation while the final section acknowledges limitations.

Smartphones run on a specific operating system (OS) and allow download of apps that run on the OS. Major operating systems include iPhone OS, Black Berry OS, Windows Mobile, Palm OS, Web OS and all the types of Linux including Android.

2. RELATED WORKS

In recent years, a considerable amount of literature has been published on e-Health 6 and m-health7 . But a few serious discussions and analyses of health care applications on smartphones emerged during this period of time. We can

broadly identify three dominant streams of literature focusing on: i) theoretical considerations of e-health an dm-health ii) empirical medical studies of online participation in e-health issues iii) technology focused research World Health Organization (2011) studied m-

health based on the findings of the second global survey on e-health. This survey documented for analysis four aspects of m-Health: adoption of initiatives, types of initiatives, status of evaluation, and barriers to implementation and fourteen categories of m-health were surveyed but none of them was about health care applications.

California healthcare foundation (April 2010) studied how smartphones are changing healthcare for consumers and

providers. Smartphones in this study play an important role in changing healthcare system and relationship between

patients and physicians. Seeking information through healthcare applications is more easily. In this study, it is predicted that till 2015 the future of healthcare system will be changed completely and smartphones will dominate in every medical sectors.

3. HYPOTHESES

Based on the literature, the following three hypotheses for the survey were proposed:
H1: There is a significant relationship between gender and use of smartphones healthcare applications.
H2: There is a significant relationship between gender and smartphones healthcare applications usage types.

4. METHOD

4.1. An online survey was conducted in fall 2011 among Tehran University students who are smartphones subscribers. The online questionnaire had 20 multiple-choice questions, developed by authors and divided in 3 sections. The 2 questions in the first section were aimed to collect demographic information about participants. In this paper, it has been tried to investigate using health care apps on smartphones among study population. So the rest of the items deal with three apps categories; Pharmacological applications, Dream meanings applications and Diet applications. The validity of questionnaire was assessed by content validity. In order to examine the scales reliability, we have used the half-split method of Cronbach's Alpha. To determine the validity of this questionnaire, first a pre-test was done. In order to reach that purpose, the questionnaire was given to 10 Tehran University professors, all majoring in the field of communication sciences and medicine. Then ,based on the professors' suggestions and ideas, the ambiguous and irrelevant questions were identified and those questions which could be modified were re-edited in the final questionnaire but those questions which were identified as totally irrelevant were omitted from the questionnaire. For the statistical purposes, PASW Statistics ver.18 was used.
The findings will be explained in details, in the findings

section.

5. SAMPLING TECHNIQUES

The population for this study was chosen from Tehran University students. Tehran University is the symbol of higher education of Iran and in its traditional form was established seven centuries ago. According to the 2011 ranking of universities and higher educational institutions ranked by the SCImago Ranking Institution (SRI) which is affiliated to Elsevier, Tehran University, has achieved first rank in the country. Due to the variety of courses and students, this university is considered to be a reliable source for assessing students in different aspects. So, we decided to choose our population from Tehran University. The number of Tehran University students was estimated about 30000 students which are too high and such random sampling cannot be an adequate way to amass an enough sample of smartphones subscribers. To deal with these issues, a non-probability sample was obtained using convenience snowball sampling which is useful for such a huge target group (Welch, 1975). The invitation letter for participating in this research was hung on every board in different departments.

The volunteer participants who got the questionnaire via email, was asked to pass it onto other Tehran University students who have smartphones. In this way, an attempt was made to create a varied sample.

6. PARTICIPANTS

According to Cochran formula, the sample size of this study was calculated 384. The participants were between 20-25 years old and they were all living in Tehran, the largest and the capital city of Iran. Of this much 223 were female and 161 were male.

7. FINDINGS

In this section some basic descriptive analysis about using smartphone and healthcare apps will be presented.

8. DESCRIPTIVE ANALYSIS

As it is mentioned above, the largest generation of smartphones are increasingly viewed as handheld computers rather than as phones, due to their powerful on-board computing capability, capacious memories, large screens and open operating systems that encourage application development. It is clear that the potential for smartphones applications to transform healthcare and clinical intervention in the community is tremendous.

Survey respondents indicated basic information about using healthcare apps on their smartphones and also

types of these apps in 3 mentioned categories.

Of 384 smartphones subscribers, only 29.2% of respondents use healthcare apps on their phones Of this 112 subscribers who uses healthcare apps on their smartphones, 58.9% stated that healthcare apps have the lowest performance on their smart phones, and just 14.3 % of them use these apps mostly.

As it is mentioned previously, the types of healthcare apps in this study is divided into 3 categories and as the descriptive analysis shows, nearly half of subscribers (43.8%) use diet and nutrition apps, 34.8% of respondents prefer to use dream meanings applications and only 21.45 of them want to get pharmacological information through healthcare apps on their smartphones.

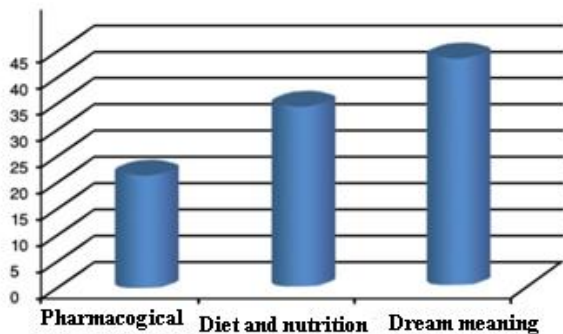**Fig.1.** Using Healthcare apps on smartphones

Fig.2. Using Healthcare apps on smart phones

9. TESTING HYPOTHESIS

The first hypothesis predicted that, there is a significant relationship between gender and use of smartphones healthcare applications. To test the first one, these variables were simultaneously entered as predicted in Chi square test.

Chi square comparison shows that gender plays an important role in using healthcare apps and as a matter of fact, female use these kinds of apps mostly .Hypothesis **2** stated that there is a significant relationship between gender and smartphones healthcare applications usage types.

Table1. Testing Hypothesis 1

	Value	df	Asymp.Sig
Pearson Chisquare	3.279	1	0.070

Based on the above table, Chi-square value and approximate significant, there is significant relationship between gender and smartphones healthcare applications usage types. Female prefer to use diet and nutrition apps then dream meanings apps and less pharmacological apps on their smartphones but male are not the same.

Table 2. testing Hypothesis 2

	Value	df	Asymp.Sig
Pearson Chisquare	8.25	2	0.001

10. DISCUSSION

Although the mobile phone has been widely used for several decades, smartphones are a more recent advance. They are mobile phones that offer not only the standard facilities such as voice and text communication, but also advance de computing and communication capability, including, for example, Internet access and geo-positioning systems. In comparison to earlier mobile phones, smartphones generally also have larger, higher resolution display screens. Most of the newer generation of smartphones also incorporate other features such as on-board personal management tools, high quality cameras and recording devices (Kamel Boulos, 2011). This kind of Technology has had a significant impact in the healthcare arena. The smartphone provides an essential 'any time, any place' portal into the entire world wide web of knowledge. Such continuous and pervasive social connectivity has important implications for society, and holds a lot of potential in particular for use in healthcare and medicine.

It is clear from their rapid proliferation and deep penetration into society, that there are significant opportunities to exploit the potential of smartphones in healthcare (Terry, 2010).

Mobile health (m-health) applications are on the rise, with many clinicians and allied health workers already adopting smartphones successfully in a diverse range of practices. Patients too are accessing health information, actively participating in their own care (participatory healthcare), and maintaining contact with their healthcare providers through smartphones (Kailas, 2010).

Notwithstanding all of the benefits we should be aware that the use of smartphone in healthcare and clinical practice, it is not without its problems and limitations.

There is a big gap between Iran and developed countries in technological issues. This lack of technological development that had a negative impact on the Telecommunication system. Also, lack of healthcare apps in Persian language can be one of the most problems for not pursuing this up-taking technology.

As it has been stated in this paper, males are not interested of using healthcare apps, but females try to adapt with new technology. By considering these observations and the obtained results from hypotheses, it can be noted that nowadays, cell phone subscribers use smartphones without paying attention to its efficient applications and healthcare apps play an entertaining role except informative role for users.

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