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# Personal Health Informatics: What is the role for online social networks?

## **Noreen Kamal**

MAGIC  
University of British Columbia  
FSC 3640 – 2424 Main Mall  
Vancouver, BC V6T 1Z4 CANADA  
noreenk@ece.ubc.ca

## **Sidney Fels**

Department of Electrical and  
Computer Engineering  
University of British Columbia  
2356 Main Mall  
Vancouver, BC V6T 1Z4 CANADA  
ssfels@ece.ubc.ca

## **Mike Blackstock**

MAGIC  
University of British Columbia  
FSC 3640 – 2424 Main Mall  
Vancouver, BC V6T 1Z4 CANADA  
mblackst@magic.ubc.ca

## **Abstract**

Personal health informatics can be a key mechanism to allow individuals to visualize and track health behavior. Providing visibility and feedback of one's diet and activity level is one way to motivate positive health behavior change. In our survey reported here, we note that personal health information such as nutritional intake and activity level are not being stored consistently by people either offline or online. We also report on the findings from our follow up interviews that indicate the importance of social influences on health behavior. They suggest that the use of online social networks may be helpful to facilitate health behavior change. However, challenges such as individual privacy concerns and the difficulty in entering consistent and accurate health information need to be overcome before social networks can be used to store personal health information.

## **Keywords**

Personal Health Informatics, social influence, health

## **ACM Classification Keywords**

H5.2. Information interfaces and presentation: User Interfaces.

## **General Terms**

Health, informatics, social influence

## **Introduction**

Personal health informatics is a component of personal informatics. However, there first needs to be an understanding of what type of information personal health informatics include. One often thinks of clinical information that is stored in medical records and health records as being an individual's primary personal health information. However, an average person has very little daily need for their medical or health record, but we manage (or mismanage) our health behavior continually based on health information that we collect informally every day.

One manages health information in their day-to-day lives, including information from various sources such as clinics, home, work and insurance companies [7]. . Health information management in the home (HIMH) shows that an individual acquires, manages and organizes a diverse set of health information, where paper-based tools are most commonly employed with various storage strategies [5]. Collectively this data is a reflection of our daily health behavior. Personal health informatics includes nutritional information through one's diet and exercise information through one's activity level.

There have been numerous commercial products developed that aim to assist individuals to collect, store, and feedback health information (e.g. Nike plus, Wii fit, Weight Watchers, dailyburn.com; tap and track; Spark People). Many of these products are based on purchasing commercial products or foods. These applications are useful only to those individual that are

already highly motivated in the collection of their personal health information, and even these individuals move through various temporal stages of use [4].

Even understanding nutritional information itself is challenging and needs to be backed up by medical evidence. Displaying nutritional information in a standardized and understandable manner is a key consideration. There is also growing criticism of the readability of the US nutritional labels and by extension Canadian nutritional labels as well [1,2] with added recommendations to how to make the labels more readable and standardize health benefit claims [2].

## **Social Networks and Health**

The popularity and huge uptake of online social networks such as facebook and twitter has revealed that people are willing to enter and share personal information. But can online social networks be a motivator for logging personal health information?

The social aspect of personal health informatics has been explored. A preliminary conceptual framework that describes personal health behavior change using online social networks is described by [3]. This paper shows that theoretical models have revealed the three main components are individual aspects such as appeal and perceptions of self-efficacy, social aspects such as belonging and subjective norms, and temporal aspects such as commitment.

The importance of social interaction has also been explored in improving health in elderly people has been explored by [6]. By providing a feedback display of participants' level of social interaction, social behavior

changed. This was explored in questionnaire and interviews, which is described below

**Storage of Health Information**

*Questionnaire*

Questionnaire feedback was solicited from a diverse cross-section of Canadian population. 104 online and paper questionnaires were completed in total. The respondents were 52% female and 48% male. The age distribution was diverse: 15% was 19-24 years old, 29% was 24-34 years old, 29% was 35-49 years old, 12% was 50-64 years old, 12% was 65-74 years old, and 3% was over 75 years old.

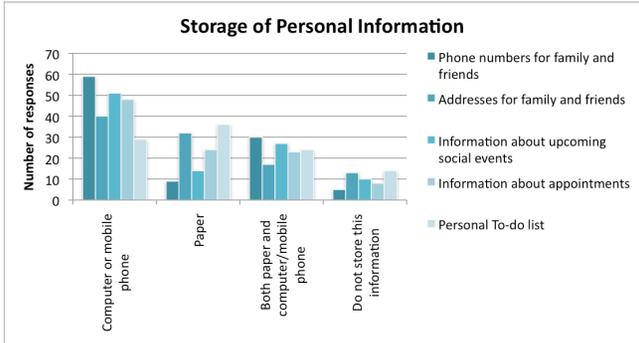
The questionnaire revealed that individuals have very different storage strategies for personal health information when compared to personal information. Personal information such as phone numbers of family and friends is largely being stored electronically. Figure 1 shows the full results for the storage of personal information. In contrast, personal health information is largely not being stored or is being stored on paper. Figure 2 shows the complete results of responses for personal health information.

These results reveal that personal health informatics remains largely untapped. Individuals are not storing personal health information such as nutritional consumption and exercise.

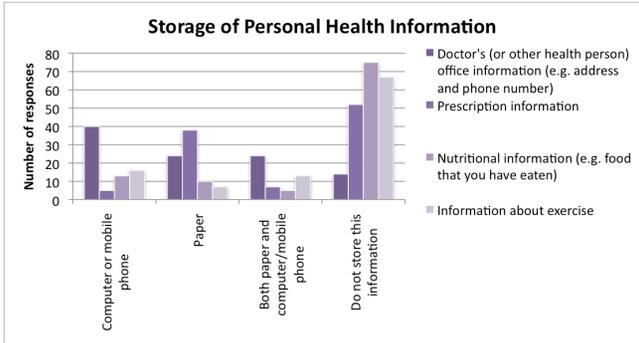
**Social Influence of Health**

*Interviews*

In addition to the questionnaire, in-person interviews were conducted with 11 adults (4 women and 7 men), who ranged in age from 19 to 49 years old. Of these 11 interview participants, 4 had health problems: one



**figure 1.** Questionnaire results showing storage strategies for personal information.



**figure 2.** Questionnaire results showing storage strategies for personal health information.

obese, one overweight, and two with high stomach acidity. Another participant claimed to be healthy, but later said that poor health behavior had lead to high stomach acidity. All of these health conditions can be managed through positive health behavior change.

The interview participants were asked about their thoughts on living a healthy lifestyle. There were 18 themes that were discussed. In analyzing the number of comments in each of these themes, 29% of the comments were about eating healthy, 16% were about exercising, 12% were about the importance of health, 6% were about the need to be organized, 5% were about the need for awareness, and the remaining 32% were split amongst 13 themes.

When the participants were asked about the social influence of health behavior, 7 themes emerged. 36% of the comments were around the influence from individuals in the same household such as family and roommates, 19% of the comments said that family and friends are positive influences on health, 14% were about how their mother being a positive health influence when they were younger, 14% were about how family and friends can pressure oneself to be unhealthy, 11% of the comments said that they were not influenced by their social connections, and the remaining 6% were split amongst 2 remaining themes.

These results reveal that food consumption and activity level are two key health concerns for individuals. However, this data is currently not being stored by individuals. Furthermore, the influence of social connections especially those that live together is a large influence in individuals health behavior.

### Challenges

Based on our surveys and interviews we suspect that users would value ways to more accurately and consistently log their food consumption and activity level for feedback toward motivating positive health changes. Furthermore, we found that behavior is

largely influenced by an individual's social connections. This provides us with some preliminary evidence that social networks can be a mechanism to not only provide motivation to use a personal health informatics system but also positively influence health behavior. However, there are many challenges that exist before such a system can be designed: 1) overcoming privacy concerns for individuals; 2) easing the burden of data entry; and 3) ensuring data accuracy.

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