

The App for Diabetic Patients on Monitoring their Physical Activities

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1. Introduction

Adequate Physical activities and exercise is good for everyone, especially for those who have type 2 diabetes. One of the benefits of exercise is that patients can control their body weight and blood sugar levels, along with eating a good diet and taking any medicine your doctor prescribes.

In addition, physical activities can increase insulin sensitivity, so that cells are better able to use any available insulin to take up glucose during and after activity.

However, people don't get enough physical activities, no matter the young population or those who have special needs, such as diabetes mellitus, thus could increase the health risks. The reasons for inadequate physical activities are complex, however, self-determination play a critical role in the loop.

The purpose of this project is to compose an App for diabetes population, to monitor patients' physical activities, then we expect that via the long-term use, could control their blood sugar and HbA1c.

2. Design Concept

The blueprint of this App was based on the App of 'Exercise-Alarm', (2013 version) which was composed by this research-team with the funding from the Sports Administration, Ministry of Education.

A major government study in the U.S., the Diabetes Prevention Program (DPP), showed that a healthful diet and a moderate exercise program resulting in a 5 to 7 percent weight loss can delay and possibly prevent Type 2 diabetes. We believed that Physical activity also plays an important part in preventing diabetes. The point of this mechanism is not merely related to the role of physical activities, it should be emphasized the long-term record of individuals' physical activities.



3. Technical Development

The App we created for population with diabetes, it consisted in several new functions that did not shown in the Exercise-Alarm App. The new functions are as follow:

(1) The multi-record function

We created the function to record the fasting blood glucose, body weight, as well as the time of physical activities. Meanwhile, HbA1c can be added in the month-period record.

(2) The diverse-analyze function

To analyze the pattern of individuals' physical activities in daily life, we tried to classified the intensity of different physical activities; for example, the intensity of riding a bike should higher than walking, moreover, playing tennis might higher than biking. When user record their daily physical activities, the App can determined total amount of moderate and vigorous physical activities, then become a direction for change one's lifestyle.



(3) The reminder function

The most interesting part of this App is reminder, which based on the concept of alarm. We need someone or something to remind us to do exercise, that is, wake-up function. We also believed that friends, families, even the doctors/nurses, will play a critical part in this App, because they can provide the function of on-time call.

4. Technological Competitiveness

Recently, there has been a lot of devices in the wearable technology space in healthcare, though most current applications are focused on wellness and health tracking. In this time, we expect that there will be increased activity in wearable technology that qualifies as medical devices and gathers data in a way that integrates into the patient's health record.

Although the technology will be more use-friendly, users have to pay some thousand dollars to get one. As our propose, the App in the cellphone should provide similar function, just likes the wearable technology that regulated as a medical device, instead of being simply a consumer wellness device, can help to revolutionize patient care while driving down healthcare costs.



5. R&D Result

The App that we compose for diabetes population will be presented in the App-Store by the end of 2014. We tried to make this program more friendly, more useful, and to provide the function similar to the wearable-device. To enables constant monitoring and data collection, we also allow that the health-care providers have the right to look at data over time and understand patterns of patient behavior. A deeper understanding of patient behavior is one of the keys to improving health, especially in managing chronic conditions that are primarily driven by leading an unhealthy lifestyle.

Not only for the users with diabetes, we also consider the App might have the additional benefits to other patients with chronic diseases, such as anxiety, COPD, and so on.

Another valuable expectation is to build one's health or physical activities history via this App. For instance, when we want to change our lifestyle to the healthier way, there is no references to follow. For this reason, we encourage the patients should make a long-term record, thus to determine the way to change. This App could be easier to expand to other special-need population. The health-care providers can also use the data from the web-based data, to identify patients that are fully compliant with their care regimen and show improvements, avoiding the need for unnecessary office visits.

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