Mobile Healthcare System for Preventive of Metabolic Syndrome

Hiroshi Inoue and Takumi Ichimura*
Graduate School of Information Sciences, Hiroshima City University
3-4-1, Ozuka-higashi, Asaminami-ku, Hiroshima 731-3194 Japan
E-mail: h-inoue@chi.its.hiroshima-cu.ac.jp, ichimura@hiroshima-cu.ac.jp
*Corresponding author

Abstract—Recently, metabolic syndrome affects a great number of people in Japan. Glycemic control can delay the onset and slow the progression of vascular complications. Lifestyle modification including weight reduction can contribute significantly to glycemic control. This paper describes the mobile application of the healthcare support system for metabolic patients.

I. INTRODUCTION

Metabolic syndrome such as diabetes is a combination of medical disorders that increase the risk of developing vascular disease and diabetes. Recently, metabolic syndrome affects a great number of people in Japan. Glycemic control can delay the onset and slow the progression of vascular complications. Lifestyle modification including weight reduction can contribute significantly to glycemic control. The Health Support Intelligent System for Metabolic Patients (HSIS) can provide guideline-based decision support for lifestyle modifications in the treatment. Generally, HSIS has two functions: GDS (Guideline-based Decision Support) and TC (TeleCounseling)[1]. This paper describes the mobile application of the healthcare support system for metabolic patients to aim at the lifestyle modification by user’s self check. Although the TC function inquires about the patient’s actual condition and offers advice to the patient by interactive communication devices such as mobile phone, PDA, and so on, the developed system can execute the function in a mobile phone. Most of the questions are filled by selecting the values and checking the boxes. The system can record user’s weight every day and draw the situation of weight decreases. Therefore, the user can modify lifestyle to achieve the predetermined plan for weight decreases. The developed software can be downloaded in the web site[2].

When the system is on the Web, users can’t check an own data. So we make the system implementable on the mobile.

II. METHOD

The mobile application in this research has been developed by the iappli development kit for DoJa-5.1 [3], which supports the development of mobile application and includes the emulation on Windows. In the emulation tool, Java2 SDK (Standard Edition Version 1.4.2), Eclipse (3.0.x, 3.1.x), NetBeans (NetBeans IDE 4.1), DirectX (8.1) are required.

The user must accept the license agreement of the developed software, because the patient of serious case are not permitted in the use. The system consists of 3 kinds of questionnaire: basic questionnaire, questionnaire for meals, and questionnaire for exercises. If a user answers all questions in the questionnaire, the system advises the comment and the plan of lifestyle modification automatically. The comments are generated according to the degree of BMI (Body Mass Index, Daily). Some plans of lifestyle modification are generated according to questionnaire. Daily records of weight are shown in the line chart.

Because the 3 kinds of questions are important, we explain them in details. First, the system asks some questions about user’s daily life style. The questionnaire is divided into 3 detailed categories.

1) Basic questionnaire

Fig.1 shows the basic questionnaire. This sheet includes the questions for “Height,” “Weight,” “daily life style,” and “limitation for exercise.” The answer for the question of “daily life style” is selected from the list of “I usually do desk work or housework,” “I usually work with standing,” or “I usually do physical labor.” The 4th question is “yes-no” question.

2) Questionnaire for meals

Secondly, Fig.2 shows the questionnaire for meals. These sheets include the questions of “Do you often eat something
between meals or late night snack?,” “Do you eat 3 meals everyday?” “How much time do you spend on a meal?,” “Do you eat rice or bread, a main dish, and a salad?,” “How often do you eat vegetables?,” “Do you eat some fried foods?,” “Do you put dressing or mayonnaise on a salad?,” “How often do you drink alcohol?,” “How much do you drink alcohol?”

The answer for the 1st question is selected from the list of “I often eat,” or “I don’t eat.” The answer for the 2nd question is selected from the list of “I eat everyday,” or “I don’t eat everyday.” The answer for the 3rd question is selected from the list of “I take less than 20 minutes,” or “I take more than 20 minutes.” The answers for the 4th and the 5th question are selected from the list of “I always eat it,” “I eat it once a day,” or “I don’t eat it everyday.” The answers for the 6th and the 7th question are selected from the list of “I often do,” or “No, I don’t.” The answer for the 8th question is selected from the list of “I drink everyday,” or “I don’t drink everyday.” The answers for the 9th question are selected from the list of “0,” “1,” “2,” or “3 or more.” The degree of alcohol means “a bottle of beer,” “180 ml of sake,” “180 ml of shochu,” “a cup of whiskey,” or “two cups of wine.”

The developed application depicts the chart of variance of weight as shown in Fig.5. It is important for a user to know the variance of weight everyday. The developed system can encourage the user to check his/her condition by himself/herself. If the user feels so hard, the plan will be changed by inputing the new answers in the questionnaire.