

Body Weight Reduction Program for Metabolic Syndrome —Introduction of Internet-based HALSMA Diet Program—

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Abstract

We developed an Internet-based body weight reduction program so called the HALSMA diet Internet version. The Internet server is set in the system by which participants and health professionals can share the data for body weight change. Using this system, we could partly automate monitoring process and then reduce the workload of health professionals. According to the result of 90 days long preliminary trial, the time for administration was reduced from 30 to 5 minutes. This amelioration of monitoring process made it possible to serve to more participants without any erosion of service quality. Furthermore, this system is expected to provide the body weight reduction program to the participants who live in the places far from the health center.

Key words: metabolic syndrome, Visceral fat, body weight reduction, Internet, HALSMA diet

❖ Introduction

In 2006, Hitachi, Ltd., Hitachi Health Care Center started a 180-days-long body weight reduction program for metabolic Syndrome so called “Hitachi Associates Life Style Modification & Action Diet” (HALSMA Diet). As presented in the previous literatures¹⁾, this program showed its effectiveness for the reduction of body weight and waist circumference as well as amelioration of clinical data such as SBP, DBP, TG, HDL-cholesterol, AST, ALT, γ -GPT, Fasted Blood Sugar, HbA1c, and insulin. About 60% of participants of this program were recovered from the metabolic syndrome (MetS) at 90 days after the start of intervention. Its effect lasted even though after 180 days and one year.

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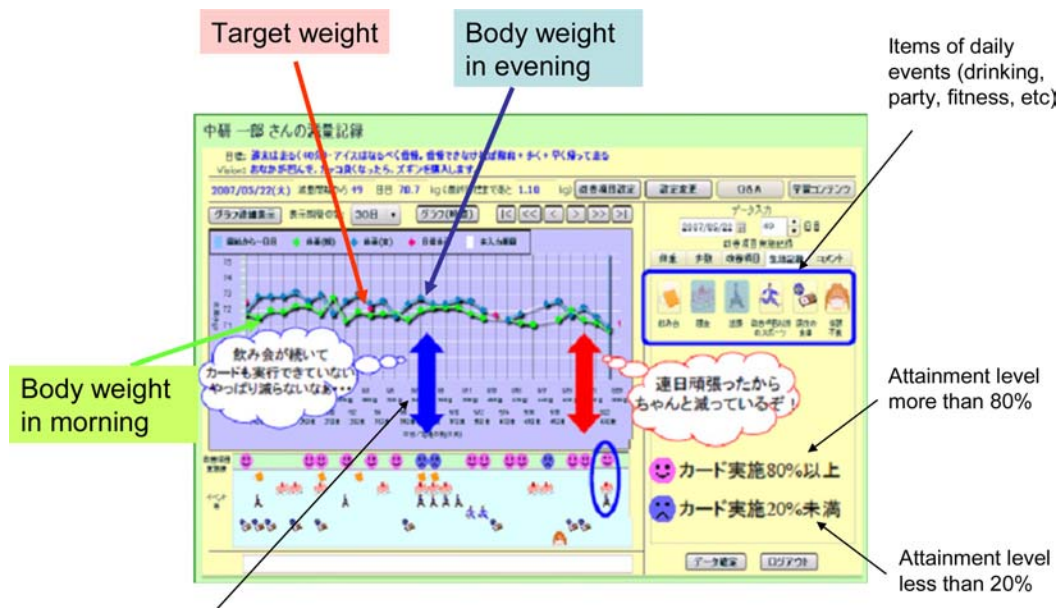
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Although its effectiveness was assured, it was necessary to modify the system in order to efficiently intervene to more peoples who requires the life-style modification. For this purpose, we have developed an Internet-based body weight reduction program so called the HALSMA diet Internet version (HALSMA-IN) and examined its feasibility and effectiveness.

❖ Outline of HALSMA-IN

The HALSMA diet program is a 180-day-long body weight reduction program. The intervention period is divided into the two phases: the first half is the reduction phase and the second half is the maintenance phase. For the first 90-days-phase, we have constructed the server based information sharing system between the participant and his health personnel in charge. All communication are secured by using the SSL communication system.

At the first on-site consultation, the occupational



By comparison between daily life events and changes in body weight, each participant can understand about one's appropriate life style.

Figure 1. A monitor of registration of HALSMA-IN

physician explains the concept of metabolic syndrome and its risk for developing cardio-vascular diseases and then requires for each participant to establish his targeted body weight. This target is usually set for 5–7% reduced weight. This reduction target is converted the per-day base calorie reduction (usually 250 to 550 kcal per day).

Then the public health nurse helped each person to establish his plan for reducing body weight. During this process, each participant was required to check the content of daily diet and physical activity using “the Active Check List” that was developed by our center. Each participant is supported to understand the behavioral problems in one’s daily life, i.e., what kinds of food one overeats in comparison with the standard 1,840 kcal menu. After understanding one’s behavioral problems, each participant required to establish one’s practical behavioral rules using the 100 kcal card. The 100 kcal card is the card that explains what activity or food is equivalent to 100 kcal with caricature. There are 1,600 cards. Finally each participant sets the reward when he attains the goal, i.e., to buy a new suit as a reward for oneself.

From the next days, each participant was required to measure his body weight twice a day (morning and

evening), to wear the pedometer and to register the results with some self-comment on health diary. The registered data is automatically processed and converted to the trend graph and the face graph. The face graph indicates the attainment level of daily behavioral target, i.e., “smiley face” for more than 80% attainment, and “sad face” for less than 20% attainment. The content of self-comment is very precious for the participant to understand which behaviors are strongly related the changes in weight; i.e., a mid meal snack and drinking for weight gain and an extra walking for weight reduction (Figure 1).

The participant receives the e-based HALSMA letter every 10 days and the encouraging e-mail from the health professional assigned for each participant. The e-mails are sent every 30 days and when pre-determined events are happened (i.e., no registration of data more than 5 days). The base content of e-mail is automatically formulated according the attainment level of each participant and the assigned health professional modify the content if necessary. If a participant was evaluated as his goal is too much difficult to attain, the modification of plan was recommended by public health nurse and reestablished the plan by on-site consultation.

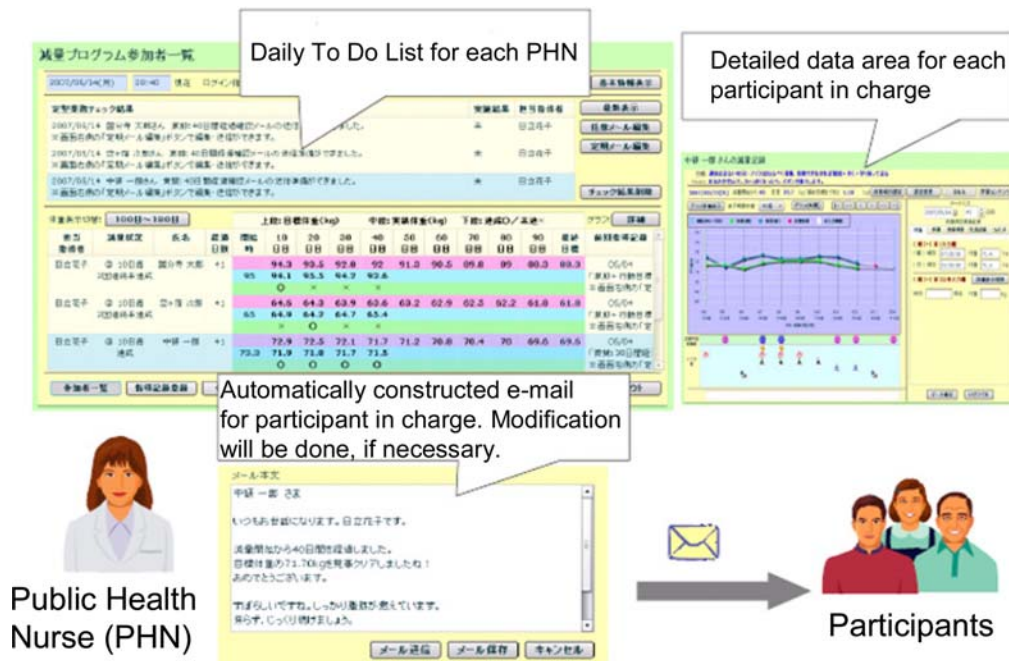


Figure 2. Administration system for PHN of HALSMA-IN

❖ Preliminary Results of Feasibility Study of HALSMA-IN

Before introducing the HALSMA-IN, 17 public health nurses had a morning meeting every day in order to check all the participants who were planned to receive e-mail during the 180 days' intervention period. After the introduction of IN based system, all participants who are planned to receive e-mail and other information are automatically selected and marked in the monitor. Thank to this system, the daily HALSMA meeting was abolished.

By introducing the personalized registration site in the web, the participant and the public health nurse in charge can share information (Figure 2). This system made it unnecessary for public health nurses to send the mail requiring for the participant to submit the report. Formally the public health nurse in charge sent the e-mail and HALSMA letter every 10 days. Furthermore, as explained above, the base structure of e-mail is automatically formulated according to the attainment level of each participant. This system has reduced much the administrative burden of public health nurse.

If the present goals are too difficult to attain, the participant can modify the content of goals and the corresponding 100 kcal cards with the appropriate

advice from the health professional assigned.

In order to test the appropriateness and effectiveness of this system, we have conducted a feasibility study from March to May 2007. The number of participants was 11 male workers (mean and SD of age: 38.2 ± 7.7). In this study, the health professionals have intervened to the participants who work far from the Health Center. That is, health professionals in Ibaraki prefecture intervened to workers in Tokyo using the internet based system. Even though this study conducted like as a distance learning course, our system could offer very personalized and timely intervention. As a result, 7 among 11 persons (63.6%) could attain their goals of weight reduction (mean and SD of reduction: 4.6 ± 3.3 kg).

The most impressive result is the reduction of administrative time. As shown in Figure 3, the administration time for each participant by each public health nurse has reduced one-sixth (30 minutes to 5 minutes) after the introduction of HALSMA-IN.

The present results have suggested that we will be able to offer a quality health education and monitoring services using the internet based intervention system. Most of the previous studies indicated the usefulness and cost-effectiveness of IT-based programs^{2, 3}). As Brug *et al.* suggested²), interventions that use personalized, or tailored feedback hold great promise for

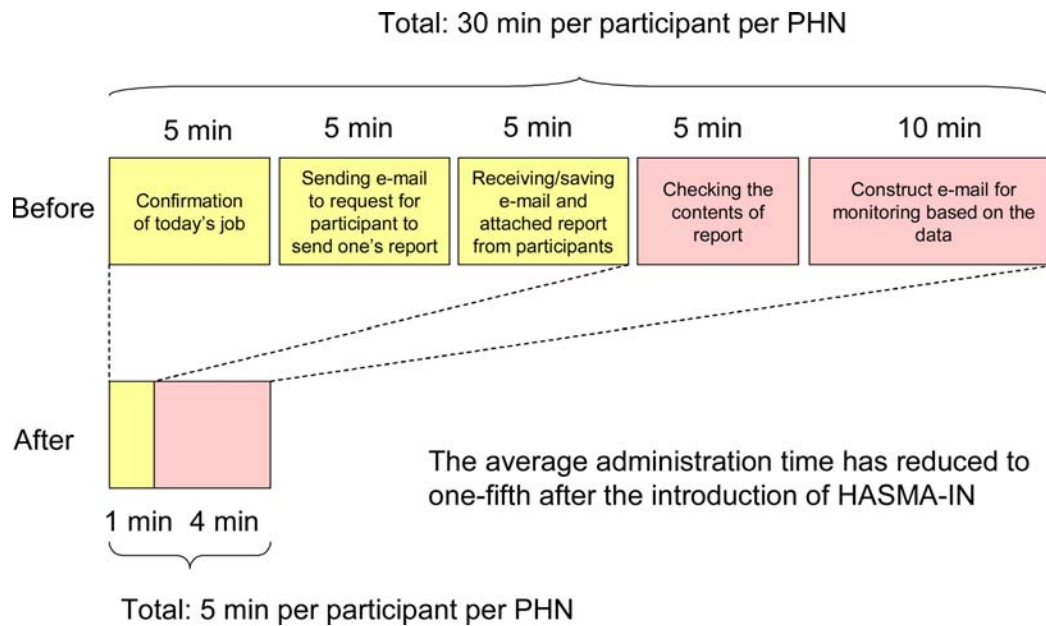


Figure 3. Reduction of Administration time by HASMA-IN

promoting health behavior changes. Tate *et al.* reported the successful reduction of body weight by continuous behavioral education using e-mail, individual feedback from therapists, and self monitoring by participants³⁾.

However, as the present feasibility study was conducted based on a small number of population, the effectiveness and feasibility should be re-examined for larger population size of study. Especially the ability to process the large number of access during a short period will be one of technical question.

From April 2008, we start to use this system for our worker under “the health checkups and healthcare advice with a particular focus on the metabolic syndrome” program. We would like to report its result in future publications.

❖ Acknowledgement

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