

HEALTH MANAGEMENT SYSTEM

1. Field of Invention

The present invention relates to a health management system, and more particularly, to a health management system for facilitating a user to realize diet control for a kidney disease.

2. Background of the Invention

In Taiwan, kidney diseases have high prevalence and incidence. Chronic kidney disease patients need to have a diet control on starch, lipid and proteins, and especially need to gradually decrease protein food. Generally, it is recommended to have 0.6 to 0.75 g/kg/day of proteins for patients with stages 1 to 4 chronic kidney diseases, and 0.6 g/kg/day of protein for patients with phase 5 of chronic kidney diseases.

In addition, kidney disease patients have decreased appetite and malnutrition, and thus need to increase calories in diet to prevent the disease from being worse. Therefore, it is very important for patients and dietitians to make the patients have sufficient nutrition and control protein contents in diet. However, most patients and even healthy people fail to realize chronic kidney diseases and restrictions on diet, such that the health care of kidney disease patients is easily ignored.

Accordingly, there is an urgent need to develop a health management system that establishes and improves diet control for kidney diseases.

SUMMARY OF THE INVENTION

The present invention provides a health management system for facilitating a user to improve diet control of a kidney disease. The health management system includes a data bank for storing a plurality of graphic data of food count units, questionnaire data

about diet control for the kidney disease and questionnaire about self-care; a display module connected to the data bank; an input module for the user to output a request or input an answer; and a data producing module connected to the data bank and the display module.

- 5 The display module is used for displaying a loop table having a plurality of columns, wherein each of the columns shows graphic data of food count units, questionnaire data about diet control for the kidney disease or questionnaire about self-care.

 The data producing module is used for receiving the request of the user, retrieving
10 the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care and transmitting the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care to the display module. In one embodiment, after the user outputs the request and before the answer is input, the display module only displays
15 the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care. In the way of question and answer, the amount of one part of food is emphasized to the user via graphs from the graphic data of food count units without a nursing staff or a dietitian.

 In one embodiment, the loop table further includes a column showing an
20 initiation point. In such embodiment, the data producing module is used for producing a forward integer from 0 to 6 while the user outputs a first request, the display module labels the user to a corresponding column from the initiation point in a clockwise direction or an anticlockwise direction according to the forward integer, and the data producing module retrieves the graphic data of food count units, the questionnaire data
25 about diet control for the kidney disease or the questionnaire about self-care from the data bank according to the column shown in the display module.

In this embodiment, after the user outputs a second request, the data producing module further produces a forward integer from 0 to 6, the display module takes the previously shown column as a base point and labels the user to another corresponding column according to the produced forward integer in the second request, and the data
5 producing module retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank according to the shown column in response to the second request.

In addition, while the column showing the graph of the diet control for the kidney disease or the graph of self-care, the user is requested to input an answer. When the
10 answer input by the user is incorrect, the data producing module produces a backward integer from 0 to 6, and the display module takes the shown column in this request as a base point and labels the user to a corresponding column according to the backward integer.

In one preferred embodiment, each of the graphic data of food count units
15 includes a picture and a text illustrating the picture. For example, the picture shows one part of food, and the text illustrates the amount of one part of food.

In accordance with the present invention, the user can output a request or input an answer via an input module, such that the user can interact with the health management system. The data producing module gradually helps the user realize the
20 diet control for the kidney disease according to the correct answer input by the user. Furthermore, the user is impressed by the graphic data of food count units, which are stored in the data back, shown in the display module.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view showing a health management system according to
25 the present invention;

FIG. 2 is a schematic view showing a loop table shown in the display module

according to the present invention; and

FIG. 3 is a flow chart showing the operation of the health management system according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 The following specific examples are used for illustrating the present invention. A person skilled in the art can easily conceive the other advantages and effects of the present invention.

 In the health management system of the present invention, the data bank may be a recording medium such as a non-volatile memory, an optical disc, a hard disc or a
10 flash memory. The graphic data of food count units, the questionnaire data about diet control for the kidney disease and the questionnaire about self-care are stored in the recording medium.

 Each of the graphic data of food count units includes a picture and a text illustrating the picture. For example, the picture shows one part of food, and the text
15 illustrates the amount of one part of food. For example, the picture shows a half steamed bun, and the text presents that the half steamed bun is 90 g, which is one part of protein. Similarly, one part of nutrition is presented as a practical amount. For example, while a half box of tofu (140 g), a bowl of rice (250 g), 2 slices of dried soybean curd (40 g) or some fish (35 g) is shown in a picture, the user would clearly
20 realize how to select food to obtain proper amount of protein or nutrition. In other words, the user may have multiple options of food and balanced nutrition via pictures shown in the display module.

 The questionnaire data about diet control for the kidney disease and the questionnaire about self-care are stored in the recording medium in advance. The
25 questionnaire may be, but not limited to, the following examples.

The questionnaire about diet control for the kidney disease includes:

Question 1: If you have a stage 4 or 5 kidney disease, what fruit can't you absolutely eat? Answer: a star fruit and products of a star fruit such as star fruit juice or dried star fruit. Since the star fruit has neurotoxicity, the patient with the kidney
5 disease may jerk and even fall unconscious if the patient eats the star fruit.

Question 2: Can patients with the late stage kidney disease drink milk or powdered milk? Answer: milk or powdered milk has abundant proteins, potassium ions and phosphorus, and is thus not suitable for patients with kidney diseases to drink. It is recommended that the patients with chronic kidney diseases select special milk
10 (low protein, low potassium and low phosphorus). Also, if the patients also have other chronic diseases, it is recommended to consult dietitians for personal requirements.

Question 3: patients with kidney diseases need to reduce meat diet, so is it right that the patients have to refuse to eat meat? Answer: the metabolites of proteins in a body are output via a kidney, and thus protein diet needs to be controlled to reduce the
15 load of the kidney. However, if there is no protein diet, the patient would have malnutrition, and the proteins in the body would be hydrolyzed, and result in adverse effects on the kidney. Therefore, patients with kidney diseases need to eat proper amount of proteins. Food such as milk, eggs, fish or beans has abundant proteins. Patients are suggested to consult dietitians, physicians and nurses for adjusting diet.

20 Question 4: patients with kidney diseases need to reduce meat diet, so is it right that patients only eat fish for meat diet? Answer: fish has abundant proteins, such that if patients eat too much fish, there would be adverse effects on the kidney. Therefore, the amount of fish diet needs to be controlled. Food such as milk, eggs, fish or beans has abundant proteins. Patients are suggested to consult dietitians, physicians and
25 nurses for adjusting diet.

The questionnaire about self-care includes:

Question 5: what stage is your kidney disease? Answer: stage _____. (In this example, the case history about the user may be stored in the data bank in advance, so as to facilitate self-care and follow-up.

Question 6: what do you need to notice while taking medicine powder to lower potassium ions in body? Answer: the medicine powder would cause burn, hot and hurt, and thus cannot be directly poured into mouth. It is suggestible to pour and stir the medicine powder in 30-50 ml of water for the patient to take.

Question 7: what is the symptom if the concentration of potassium ion in blood is too high? Answer: if the concentration of potassium ion in blood is too high, the patient may have arrhythmia, chest pain, palpitations and even no heartbeat. Therefore, the patient with the kidney disease should not eat food having too many potassium ions.

Question: what do you need to notice while taking phosphorus-reducing drug (such as calcium tablets or gastro resistant tablets)? Answer: each calcium tablet or gastro resistant tablet needs to be divided into 4 or 5 pieces, and each piece of the calcium tablet or the gastro resistant tablet is mixed with food for the patient to take. Alternatively, the calcium tablet or gastro resistant tablet is ground into powders to be mixed with rice for the patient to eat. The dosage of the phosphorus-reducing drug is adjusted in response to the phosphorus content of the meal or snack.

Question 9: To protect the kidney, what is a normal value that the blood pressure needs to be controlled at? Answer: for patients having urinary proteins less than 1 g/day, the blood pressure needs to be controlled under 130/80 mm-Hg, and for patients having urinary proteins more than 1 g/day, the blood pressure needs to be controlled under 125/75 mm-Hg.

The above questionnaire about diet control for the kidney disease and the questionnaire about self-care are used for illustrating the present invention. The

questionnaire may be true-false questions or multiple-choice questions.

FIG. 1 shows a health management system 1 according to the present invention. The health management system 1 includes a display module 10, an input module 14 and a data producing module 16.

5 In the health management system 1 of the present invention, the display module 10 is connected to a data bank 12, the input module 14 is used for a user to output a request or input an answer, and the data producing module 16 is connected to the data bank 12 and the display module 10, wherein the display module 10 can be directly connected to the data producing module 16 and then connected to the data back 12.
10 Further, the input module 14 is connected to the data producing module 16.

The display module 10 may be a display device such as an LCD display, a plasma display, an LED display or an OLED display. In addition, the display module 10 may be integrated with the input module 14, wherein the input module 14 is not a keyboard, but can be a voice receiver or a touch panel integrated with the display. In one
15 embodiment, the health management system of the present invention is applicable to a portable device such as a cell phone or a tablet PC.

Further, the data producing module 16 includes at least a CPU (central processing unit) or a memory. The memory may be integrated with a recording medium. The CPU is used for executing programs in the memory to control the display module 10 and the
20 data bank 12.

FIG. 2 and FIG. 3 show the health management system according to the embodiments of the present invention.

As shown in FIG. 2, the display module shows a loop table 21 via a display interface such as a screen 20, and the loop table 21 includes a plurality of columns C1
25 to C16. The number of columns is not limited to 16. Further, each of the columns C1 to C16 is used for showing a graph of food count units, graph of diet control for

kidney diseases or a graph of self-care. For example, the column C2 shows a picture or a graph having text illustrating food count units. After the data producing module retrieves the graphic data of food count units, the screen 20 shows the picture. In one embodiment, the loop table 21 further includes the column C1 showing an initiation point.

FIG. 3 shows the operation of the health management system according to the present invention.

While the user interacts with the health management system of the present invention, the input module is used for the user to output a request or input an answer, and the data producing module receives the request of the user, retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank, and transmits the data to the display module. After the request is output and before the answer is input by the user, the display module only shows the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care.

In order to make a use more interested in and have more fun, when the health management system of the present invention is operated by the user, in the step S1, for example, the user starts from the initiation point and outputs a first request, and the data producing module randomly retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank, and indicates the user to browse the displayed graphic data of food count units or to answer the questionnaire about diet control for the kidney disease or the questionnaire self-care.

Next, the step S2 is performed by the data producing module. The data producing module randomly produces a forward integer from 0 to 6. Then, the step S3 is

performed by the display module. The display module labels the user to the corresponding columns C1 to C7 from the initiation point C1 in a clockwise direction or an anticlockwise direction in the screen 20. For example, the location of the user is indicated by text or a color, the data producing module retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank, and the graphic data or the questionnaire data are displayed in the display module. For example, when the forward integer is 1, the user is labeled to a corresponding column C1 in an anticlockwise direction, and the user can browse the graphic data of food count units shown in the column C1 or the central portion of the loop table 21 in the screen 20.

While displaying the column showing the graph of diet control for a kidney disease or self-care according to the forward integer, the user is requested to input an answer. For example, if the forward integer is 4, the user is labeled to the corresponding column C5 in the anticlockwise direction and the user is requested to answer the questions about diet control for the kidney disease as shown in the S4 in FIG. 3.

In the step S5, the data producing module identifies whether the answer is correct. If the answer is correct, the step S1 is performed and the user further outputs a request.

After the user further outputs the request, the data producing module further produces a forward integer from 0 to 6, the display module takes the shown column in response to the previous request as the base point and labels the user to the corresponding column according to this further request, and the data producing module retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank according to this further request.

In addition, if the answer input by the user is incorrect, the step S6 is performed

by the data producing module, so as to produce a backward integer from 0 to 6. Then, the step S7 is performed by the display module, the shown column in response to this request is taken as a base point, and the user is labeled to a corresponding column according to the backward integer. According to the program, the most backward process is back to the initiation point. In the step S7, the user browses the graphic data of food count units; or is requested to input an answer according to the backward column. In order to establish the understanding of diet control for a kidney disease, when the answer is incorrect, the display module displays the correct answer for the user to learn.

10 In addition, in order to increase variations, the loop table may have at least a backward column for directly moving a user backward. For example, the column C9 shows "nutrition consulting" (the displayed content is not limited to "nutrition consulting"), and after the step S3 or S7 is performed by the display module and the user is labeled to the backward column, the data producing module produces a backward integer from 0 to 6, and a further backward process is performed. Similarly, 15 the loop table may have a forward column for directly moving a user forward.

In the step S9, the data producing module identifies whether the answer is correct. If the answer input by the user in the step S8 is correct, the step S1 is performed. If the answer is incorrect, the step 10 is performed, *i.e.* back to the step S6.

20 In another embodiment of the present invention, multiple users may interact with the health management system of the present invention, and take turns to answer questions, so as to establish correct concepts.

In accordance with the health management system of the present invention, during the interaction between a user and the health management system of the present invention, the user learns correct concepts and correctly selects various foods 25 according to the graphs shown by the display module. Accordingly, the health

management system can effectively help a user to understand diet control for a kidney disease

The invention has been described using exemplary preferred embodiments. However, it is to be understood that the scope of the invention is not limited to the
5 disclosed arrangements. The scope of the claims, therefore, should be accorded the broadest interpretation, so as to encompass all such modifications and similar arrangements.

CLAIMS

1. A health management system for facilitating a user to improve diet control of a kidney disease by the interaction between the user and the health management system,

5 the health management system comprising:

a data bank which is a recording medium for storing a plurality of graphic data of food count units, questionnaire data about diet control for the kidney disease and questionnaire about self-care, wherein each of the graphic data of food count units includes a picture presenting one part of food and an amount of the part food;

10 a display module connected to the data bank for displaying a loop table including a plurality of columns, wherein each of the plurality of columns is used for displaying the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care;

an input module for the user to output a request or input an answer; and

15 a data producing module connected to the data bank and the display module, the data producing module receiving the request of the user, retrieving the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the

questionnaire about self-care and transmitting the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care to the display module, wherein after the user outputs the request and before the answer is input, the display module only displays the graphic data of food count
5 units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care.

2. The health management system of claim 1, wherein one of the columns of the loop
table is used for showing an initiation point.

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3. The health management system of claim 2, wherein after the user outputs a first request, the data producing module produces a forward integer from 0 to 6, the display module labels the user to a first corresponding column from the initiation point in a clockwise direction or an anti-clockwise direction according to the forward integer,
15 and the data producing module retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank according to the first corresponding column displayed in

the display module.

4. The health management system of claim 2, wherein after the user outputs a second request, the data producing module further produces a forward integer from 0 to 6, the

5 display module takes the column of the first request as a base point and labels the user to a second corresponding column according to the forward integer, and the data producing module retrieves the graphic data of food count units, the questionnaire data about diet control for the kidney disease or the questionnaire about self-care from the data bank according to the column in response to the second request.

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5. The health management system of claim 4, wherein while being forwarded to the column showing a graph of diet control for the kidney disease or a graph of self-care, the user is requested to input the answer.

15 6. The health management system of claim 5, wherein the answer input by the user is incorrect, the data producing module further produces a backward integer from 0 to 6, and the display module takes the column as the base point and labels the user to a

corresponding column according to the backward integer.

7. The health management system of claim 1, wherein the input module is connected to the data producing module.

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8. The health management system of claim 1, wherein at least one of the columns of the loop table is a forward column or a backward column.