

# PHR Based Life Health Index Mobile Service Using Decision Support Model

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**Abstract** In modern society, interest in health is increasing and the development of medical devices and wireless communication enabled people to get healthcare services easily anytime and anywhere, i.e. ubiquitous healthcare. The development of IT convergence and network technology enabled users to obtain user-centered useful information easily through portable mobile devices as well as computers. Currently, healthcare related user-centered healthcare contents are being actively served and demand related to disease prevention or health promotion is steadily increasing. This paper proposes PHR-based life health index mobile services using a decision support model. A decision support model is developed by using health index related data of existing health weather index service and national health and nutrition survey provided by the Korea Meteorological Administration (KMA) and applications of the mobile environment are developed so that users can receive healthcare services easily anytime and anywhere. The developed mobile service application implemented its interface for the user's convenient healthcare and was developed to enable interlocking with the user's PHR information through web server. Unlike comprehensive and standardized index services of existing KMA health weather index and life health index service, the developed mobile service is serving the user's health status in three stages of danger, alert, safety by using personalized PHR information. The development of the PHR-based life health index mobile service using the decision making model allowed users to check current health status index and obesity measurement, body mass index (BMI), abdominal obesity, potential obesity risk index etc. easily anytime and anywhere only with simple input in the interface of mobile application. Also, accurate and

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subdivided services can be offered to users and more personalized services enable users to use efficient healthcare service.

**Keywords** Decision support system · PHR · Life health index · U-health · Healthcare · Mobile application · IT convergence

## 1 Introduction

As the convergence technology is developing rapidly and the Internet is spreading throughout the world in modern society, users were able to get a lot of scattered information easily through computers and portable mobile devices [1, 2]. The entry into the information society not only improves the quality of life but offers health-related user-centered health care contents actively. Due to such rapid industrialization and improvement of the economic level, changes in disease aspects, aging society, implementation of separation of prescribing and dispensing drugs, disease prevention or health promotion related demand has grown steadily. This change in lifestyle and aging are changing interest from disease treatment centeredness and health promotion and healthcare centeredness. As the chronically ill increase, healthcare services in U-health environment have evolved from the treatment and management of specific diseases to personalized prevention services for the service subject [3–6]. As Smartphones are popularly used, significant changes are appearing in the medical life [7]. Due to the rapid spread and utilization of mobile devices and environment using private devices such as Smartphones, tablets, pads etc., 3600 kinds of applications about medical treatment in mobile application stores and half of them are applications with the telemedicine form providing health, disease information [8–15]. This trend means that demand of medical customers for self-healthcare is increasing exponentially [16].

This paper proposes the PHR based health index mobile service using the decision support model. The life health index is served from health weather index service of KMA and PHR based decision making modeling. By using PHR and health weather index of KMA, this enables differentiated customized health index service. In order to serve health index by user, health index related factors data are analyzed by using SPSS targeting the national health and nutrition survey of the Ministry of Health and Welfare and the decision support modeling is carried out by using the statistical analysis tool R<sup>1</sup> based on this. In addition, User Interface is developed so that users can have access to PHR in the optimized UI/UX-based mobile environment. The health index service via mobile is available in everyday life by classifying the user's health status into three stages of danger, alert, safety. Also, the healthcare services on degree of obesity, BMI, abdominal obesity, obesity risk index etc. are provided for each user. By implementing PHR-based life health index mobile service using the proposed decision support model to user-centered User Interface of for the mobile environment, users can determine their current medical condition only with simple input in the interface of mobile application and differentiated life health index services are provided [34, 17, 18].

This paper organized as follows. Section 2 examines PHR service and health weather index service provided by KMA and Sect. 3 describes the life health index using the

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<sup>1</sup> The R project, [www.r-project.org](http://www.r-project.org).

decision support model. Section 4 describes the developing PHR-based life health index mobile service implementation and Sect. 5 makes a conclusion.

## 2 Related Research

### 2.1 Life Weather Information Service of KMA

To enable that weather information can be directly used in human life, KMA [19] is serving the degree of meteorological factors affecting people as life weather information. The health weather index and life weather index of life weather information is to indicate the degree of influence of weather factors as index. This helps life by indicating it with the index of the scientific quantitative indication method from the qualitative indication method, the unscientific indication method. Status values and predictive values are served by region in the form of graph and table by using real-time observation data and numerical forecasting data for observation points distributed throughout Korea. Figure 1 shows the weather information service of KMA.

Items served as life weather information include life weather index and health weather index and are served by current index, region, index. Life weather indexes includes UV Index, food poisoning Index, discomfort index, heat index, sensory temperature, possible freezing index, atmospheric dispersion index and health weather indexes includes possible cold Index, possible asthma—lung disease index, possible stroke index, possible skin disease index, pollen concentration risk index. The services of life weather index and health weather index consist of four stages of very high, high, medium, and low.

### 2.2 Personal Health Record (PHR)

The aspect of diseases is changing from acute disease centeredness and chronic disease centeredness and long-term sustainable healthcare and health promotion activities are

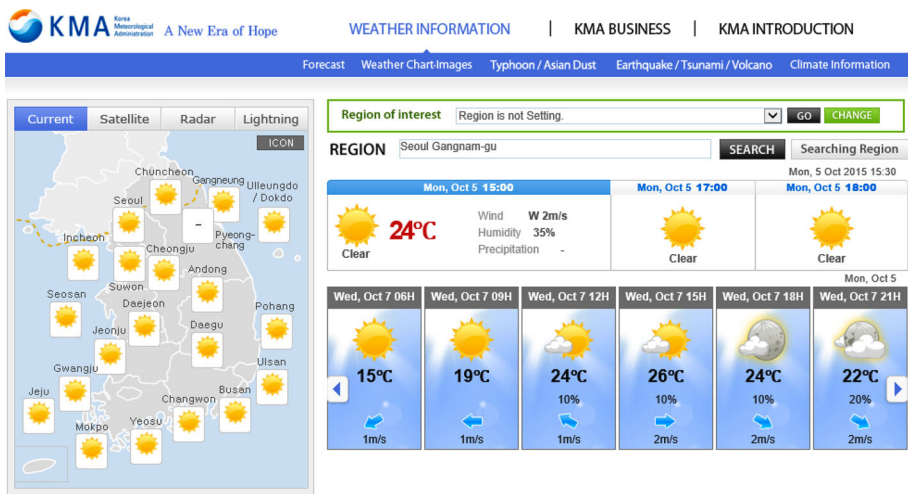


Fig. 1 Weather information service of KMA

increasing rather than short-term intensive care. Such continuous healthcare should be managed subjectively through PHRs [20, 21]. PHR is a tool that allows users to directly enter and manage their health information to enable them to view their medical information anytime and anywhere to support this continuous healthcare and is a service of gathering and providing information generated whenever users receive a medical examination in a hospital school or health checkup center or hospital. Also, it means a system that can link an individual's health information effectively in collaboration with national institutions, various medical institutions to support the health promotion of the people, health and medical service consumers. In order to meet the steadily increasing demand for healthcare, the current healthcare information system is operating a variety of systems and the resulting information budget is constantly on the rise. Utilization and usefulness of PHR are increased further as more and more health data are accumulated. Figure 2 shows the conceptual diagram of PHR.

Once PHR is built, the hospital-centered medical environment is changed to the patient-centered one. However, the development purposes of PHR and electronic medical record (EMR) of medical institutions are different from each other. PHR can be said to be a tool that enables individuals to manage their PHRs in terms of enhancing the information sovereignty of individuals, especially patients and EMR is a tool developed by medical institutions to increase the accessibility and management efficiency of the medical records of hospitals. In addition, EMR is a tool of storing medical records recognized legally and PHR is a tool of storing records with mixed legal medical records and PHRs not legal records. Therefore, if PHR is built and used, there are advantages such as universalization of health records and support of U-healthcare, patient education and management, expansion of treatment information exchanges between hospitals etc. PHR can be recognized as a crucial tool to form smooth communication between medical staff and customers

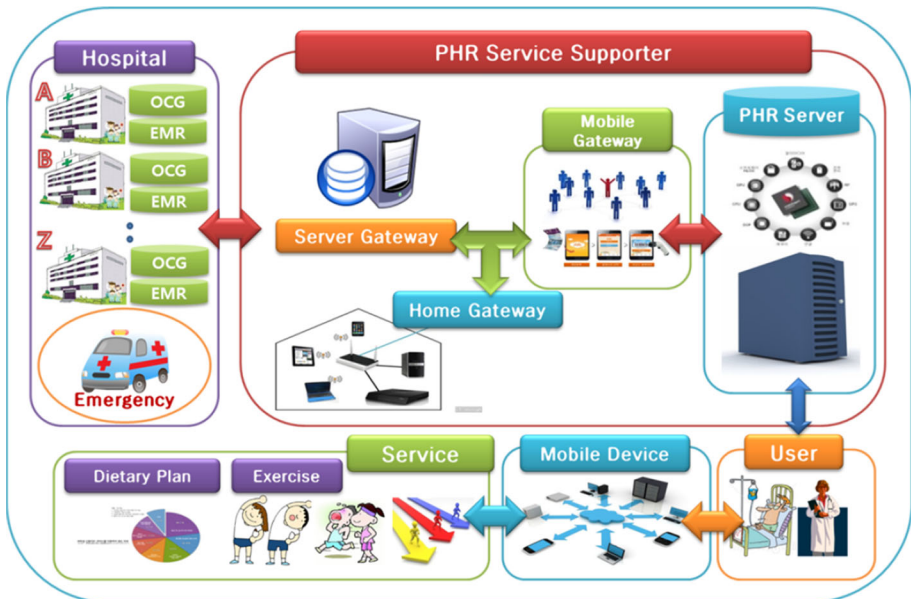


Fig. 2 Conceptual diagram of PHR

and it is expected to reduce or eliminate duplicate treatment or prescription through PHR system and save time costs. It is expected that patients with disease can play a more active role in disease prevention and healthcare because they know better about their own health information than anyone else and this can promote patients' rights [22, 23].

### 3 PHR-Based Life Health Index Using Decision Support Model

#### 3.1 Data Selection and Preprocessing

To configure the decision support model, health-related data are preprocessed and attributes are extracted. In order to select life health index data, this paper use the 6th national health and nutrition survey [24, 44, 45]. The 6th national health and nutrition survey was carried out from primitive data in 2013 and is data released by Korea Centers for Disease Control and Prevention in January 2015. The national health and nutrition survey is a survey on levels of health, health-related awareness and behavior, food and nutritional intake status of the people performed by Korea Centers for Disease Control and Prevention of the Ministry of Health and Welfare and is to calculate statistics with representativeness and reliability in national and urban provincial unit and is basic data necessary for health policy establishment and evaluation such as goal setting and evaluation of comprehensive national health promotion plan, health program development, etc.

Currently, representative smart health services include dietary nutrition, exercise prescription service, chronic disease management and obesity management service and are the most widely used in the smart health service model for healthcare. The proposed PHR-based life health index mobile service using the decision support model requires identification of the health index-related data through integrated management modeling to serve health index for the user's healthcare. With reference to previous studies [25–29], the health survey for selecting health index-related data set health index-related attribute data. In this paper, we select factors that can provide health index services based on national health and nutrition survey data and define them as attribute data and determine selected attribute data if they are significant as health index determination factors.

The selection of context data to determine whether significant for health index related factors is as shown in Table 1. Of total 23 variables, health index-related data consist of 22 input variables and 1 output variable. The items configured as input variables are defined as context data and determined whether to be similar to factor items configured as output variables. In order to determine the attribute data, selected 23 data needed to be preprocessed. Preprocessing is a process of removing items with missing input and unnecessary items. Table 2 shows the preprocessing process for health index-related data, attribute data of total 23 variables.

Of total 8518 records, 3221 records were selected by removing Null values and 'do not know' item and 'non-applicable' item which are unsuitable for the factor analysis. In addition, by removing the non-applicable item of the output variable, the recommended result, 3221 records are finally used. Factors are identified by using 3221 data.

In order to determine if attribute data are suitable for health index factors, it is determined if they are significant for life health index, the output variable. In order to identify selection factors by determining the significance probability of 3221 data, Clementine 21.0 of SPSS is used and Multivariate analysis is used [30–39]. A significance level is defined as 0.05 and according to the analysis result, significant attribute data are a total of 11 among

**Table 1** Attribute data

Classification	Data (variable name)	Scope
Input	Sex	[Men, women]
	Income quartile-individual (Incm)	[Low, medium low, medium high, high]
	Exercise (BO3_01)	[Yes, no, non-applicable]
	Whether not feeling very well for recent 2 weeks (D_2_1)	[Yes, no, do not know]
	Occupation (Occp)	[Administrators, experts and related practitioners, clerks, service and sales workers, skilled agriculture, forestry and fishery workers, craftsmen, device, machine operation and assembly workers, simple labor workers, unemployed (housewives, students, etc.)]
	Exercise capacity (LQ_1EQL)	[I have no difficulty in walking, I have somewhat difficulty in walking, I should be in bed all day, non-applicable, do not know]
	Current smoking status (BS3_1)	[Smoking, smoking sometimes, used to smoke but not anymore, non-applicable, do not know]
	Drinking frequency for 1 year (BD1_11)	[I did not drink at all for the last 1 year, Less than once a month, about once a month, 2–4 times a month, about 2–3 times a week, more than 4 times a week, non-applicable, do not know]
	Number of days of vigorous physical activity a week (BE3_11)	[Not at all, 1, 2, 3, 4, 5, 6, 7 days (every day), non-applicable, do not know]
	Degree of usual stress awareness (BP1)	[feel very much, relatively feel a lot, relatively feel a little, hardly feel, non-applicable, do not know]
	Self-management (LQ_2EQL)	[I have no difficulty in taking a bath or wearing clothes, I have some difficulty in taking a bath or wearing clothes alone, cannot take a bath or wear clothes alone, non-applicable (children and adolescents), do not know]
	Weight control for 1 year (BO2_1)	[Tried to reduce weight, tried to maintain weight, tried to gain weight, tried not to control weight, non-applicable, do not know]
	Marital status (Marri_1)	[Married, single, do not know]
	Hypertension (DI1_pr)	[Yes, no, non-applicable (have never suffered from it)]
	Diabetes (DE1_pr)	[Yes, no, non-applicable (have never suffered from it)]
	Dyslipidemia (DI2_pr)	[Yes, no, non-applicable (have never suffered from it)]
	Daily activities (LQ_3EQL)	[I have no difficulty in daily activities, I have some difficulty in daily activities, I cannot carry on daily activities, non-applicable (children and adolescents), do not know]
	Pain/discomfort (LQ_4EQL)	[I feel no pain/discomfort, I feel somewhat pain/discomfort, I feel very severe pain/discomfort, non-applicable (children and adolescents), do not know]
	Anxiety/Depression (LQ_5EQL)	[I am not anxious or depressed, I am somewhat anxious or depressed, I am badly anxious or depressed, non-applicable (children and adolescents), do not know]
	Output	Subjective health status (D_1_1)

**Table 2** Data preprocessing process

	Filename	Description	Number of data
Original	Original	Original data set	8518
Data selection	DATA_1st	Data selection	8518
Removing null value	DATA_2nd	Removing null value	6218
Removing [do not know] item	DATA_3rd	D_1_1, D_2_1, LQ_1EQL, BS3_1, BD1_11, BE3_11, BP1, LQ_2EQL, BO2_1, marri_1, LQ_3EQL, LQ_4EQL, LQ_5EQL	5326
Removing [non applicable] item	DATA_4th	LQ_1EQL, BS3_1, BD1_11, BE3_11, BP1, LQ_2EQL, BO2_1, DI1_pr, DE1_pr, DI2_pr, LQ_3EQL, LQ_4EQL, LQ_5EQL, BO3_01, BO3_03	3221
Sample data extraction	DATA_5th	Sample dataset	3221

**Table 3** Identification of health index-related attribute data factors for creating a decision support model

Data (variable name)	Scope
Sex	[Men, women]
Exercise (BO3_01)	[Yes, no, non-applicable]
Exercise capacity (LQ_1EQL)	[I have no difficulty to walk, I have somewhat difficulty to walk, I should be in bed all day, non-applicable, do not know]
Current smoking status (BS3_1)	[Smoking, smoking sometimes, used to smoke but not anymore, non-applicable, do not know]
Drinking frequency for 1 year (BD1_11)	[I did not drink at all for the last 1 year, Less than once a month, about once a month, 2–4 times a month, about 2–3 times per week, more than 4 times a week, non-applicable, do not know]
Number of days of vigorous physical activity a week (BE3_11)	[Not at all, 1, 2, 3, 4, 5, 6, 7 days (every day), non-applicable, do not know]
Weight adjustment for 1 year (BO2_1)	[Tried to reduce weight, tried to maintain weight, tried to gain weight, tried not to control weight, non-applicable, do not know]
Hypertension (DI1_pr)	[Yes, no, non-applicable (have never suffered from it)]
Diabetes (DE1_pr)	[Yes, no, non-applicable (have never suffered from it)]
Dyslipidemia (DI2_pr)	[Yes, no, non-applicable (have never suffered from it)]
Daily activities (LQ_3EQL)	[I have no difficulty in daily activities, I have some difficulty in daily activities, I cannot carry on daily activities, non-applicable (children and adolescents), do not know]

health index-related attribute data: sex, Exercise (BO3\_01), Exercise capacity (LQ\_1EQL), Current smoking status (BS3\_1), Drinking frequency for 1 year (BD1\_11), Number of days of vigorous physical activity a week (BE3\_11), Weight adjustment for 1 year (BO2\_1), Hypertension (DI1\_pr), Diabetes (DE1\_pr), Dyslipidemia (DI2\_pr), daily activities (LQ\_3EQL). Therefore, according to the results of Multivariate analysis, 11 health index related factors of context data are used for creating a decision support model.

Table 3 shows the results of identifying health index-related attribute data factors for creating a decision support model.

### 3.2 User-Centered Healthcare Service

PHR-based smart health mobile service provides a variety of healthcare services for the user's efficient healthcare. First, it is important to check standard weight and set a weight loss goal with obesity management service for the user's obesity management and prevention. In order to provide obesity management service, medical guidelines are needed. By measuring the degree of obesity and calorie consumption by the degree of activity depending on the degree of obesity, the plan of activity and exercise can be managed efficiently. BMI figures lower than 18.5 are classified into underweight and calorie consumption per unit weight is classified and shown into 35/40/45 in the order of light activity/moderate activity/severe activity. BMI figures of 18.5–22.9 are classified into normal and calorie consumption per unit weight is classified and shown into 30/35/40. BMI figures of 22.9–25 are classified into overweight and calorie consumption per unit weight is classified and shown into 25/30/35. BMI figures higher than 25 are classified into obesity and calorie consumption per unit weight is shown as 25/30/35. Table 4 shows calorie consumption depending on the degree of obesity.

PHR-based smart health mobile service can measure the degree of obesity and BMI based on the user's PHR. Also, if there is no user's PHR, it provides the degree of obesity, appropriate weight and BMI if you enter height, weight, sex. Obesity means the state that the absolute amount or ratio of body fat has increased and the degree of obesity shows the degree of (%) obesity. Obesity measurement results serve the degree of obesity and calorie requirement depending on the degree of activity by classifying them into underweight, normal weight, overweight, obesity and show obesity categories depending on each classification and calorie requirement depending on the degree of activity.

BMI measurement is a formula for estimating the amount of fat by using weight and height and the index reflecting the percentage of body fat and health risk. BMI measurement results classify the user's weight state into underweight, normal weight, overweight, obesity, extreme obesity and serve them with BMI. If entering weight and height, sex for measuring the degree of obesity or selecting PHR information, height and weight are automatically entered and obesity measurement results are provided. BMI is shown as  $\text{weight}(\text{kg})/(\text{height}(\text{cm})/100)^2 + (\text{height}(\text{cm})/100)$ . Table 5 shows the status classification of users according to BMI.

Abdominal obesity is measured by waist, hip circumference, sex of the user. The measurement results of abdominal obesity is based on the value 1 in the case of men and

**Table 4** Calorie consumption depending on the degree of obesity

Classification	BMI	Calorie consumption per unit weight depending on degree of activity (Kcal/kg)		
		Light activity	Moderate activity	Severe activity
Underweight	<18.5	35	40	45
Normal weight	18.5–22.9	30	35	40
Overweight	22.9–25	25	30	35
Obesity	>25	25	30	35



**Table 5** Health status classification according to BMI

Classification	BMI
Extreme obesity	BMI > 30
Obesity	BMI > 25
Overweight	BMI > 23
Normal weight	BMI > 22
Underweight	BMI ≤ 22

**Table 6** Health status classification depending on abdominal obesity

Classification	Male	Female
Abdominal obesity = Waist circumference/Hip circumference		
Abdominal obesity	Abdominal obesity >1.0	Abdominal obesity >0.85
Normal	Abdominal obesity <1.0	Abdominal obesity <0.85

**Table 7** Health status classification according to potential risk of obesity

Classification	The degree of obesity	BMI	Abdominal obesity	Obesity family history
Danger	120 or more	25 or more	1 or more	O
High	110 or more	23 or more	1 or more	O
Medium	90 or more	22 or more	1 or less	X
Low	90 or less	22 or less	1 or less	X

the value 0.85 in the case of women. Abdominal obesity is classified and provided into abdominal obesity and normal. Table 6 shows the health status classification depending on abdominal obesity.

The future, potential risk of obesity can be indicated with the degree of obesity and BMI, abdominal obesity and obesity family history shown in user healthcare service. If entering sex, height, weight, waist circumference, hip circumference, obesity family history, potential risk of obesity can measure potential risk for obesity. For example, if the degree of obesity is more than 120, BMI is more than 25, abdominal obesity is more than 1 and there is obesity family history, the health status according to potential risk of obesity is shown as the risk status. The health status classification according to potential risk of obesity is classified and served into the four stages of danger, high, medium, low. Table 7 shows the health status classification according to obesity risk.

### 3.3 Decision Support Model for Life Health Index

Life health index service is the user-centered individualized health index service that applies decision support model. It provides the individualized health management service based PHR information of user, weather-related health index of KMA<sup>2</sup> and daily weather index. Decision support model is required along the health information of an individual to provide living health index service. Now that decision support model is expressed in tree

<sup>2</sup> Korea Meteorological Administration, <http://web.kma.go.kr/eng>.

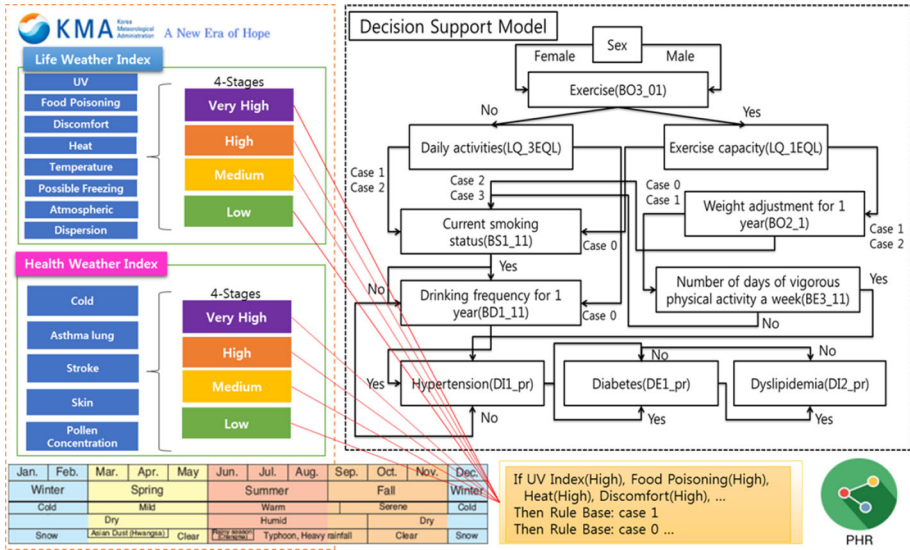


Fig. 3 Decision support model for life health index service

structure of top-to-bottom, it is the efficient method when sorting, forecast and analyze data. It is easy to interpret the results and possible to apply huge data stably in general computer environment using white box model. Decision support is easy to draw the rule from artificial intelligence, machine learning, information search and statistics and can be applied to the fields whose purpose is to classify or forecast. It is not only used as the recommendation model but used to search threshold or find the variable required for multivariate analysis. After distinguish the significant data against PHR and health-related factor to provide living health index service, it generates rule-based decision support model through the distinguished data. In order to generate decision support model based on rule, decision support tree method and mining method. Decision tree is the method that is used generally in data mining and there are some methods such as CHAID [40–43]. This thesis generates decision-making model using C5.0 and Apriori algorithm that supplements ID3 algorithm. The meaningful and related rules from huge data by applying Apriori algorithm to decision support. Mining of the related rule is conducted based on health-related factor identification data. In here, the optimized decision support model is set up. In order to provide the individual service along the position and environment. So, it is possible to provide the individualized living health index service along situation awareness of the user. Figure 3 shows the decision support model for the life health index service.

## 4 System and Implementation

### 4.1 Service Environment

PHR-based life health index mobile service manages user-specific health by using the decision support model based on life weather information of KMA, national health and nutrition survey. Users receive healthcare services regardless of time and place in the



**Fig. 4** Service environment

optimized UX/UI based mobile interface [44–48]. By complying with security guide of HL7 standards, standards-based encryption when interlocked with PHR, it protects medical information and develops a server module. The server module configures database with HL7-based health status information, PHR, medical information and interlocks EMR of medical institutions. Data transmission between android-based mobile and server uses HTTP-based mutual interlocking technology developed in the past. Users transmit health status information to the server through mobile interface and it is analyzed with PHR data. By using the analyzed information, health information, life health index, dietary nutrition, and exercise prescription are feed backed through mobile service. This is based on PHR and provides various and personalized services to users. Figure 4 shows the service environment for the PHR based life health index mobile service.

User-centered optimized UX/UI-based life health index mobile service can manage users’ health easily and conveniently. By using the function of mobile interface, they receive convenient services such as medical information, dietary nutrition and exercise prescription etc. Even before entering silver generation, care through diet adjustment, regular check-ups, exercise prescription etc. is needed and the elderly must manage their health for treating and preventing diseases.

#### 4.2 PHR-Based Smart Health Mobile Service

The PHR-based life health index mobile service using the decision support model developed application by using Android Studio 1.1.0 in windows 7 Ultimate 64bit environment in the specifications of Intel core i7 processor, 3.4 GHz, 16.00 GB RAM. PHR-based smart health mobile service consists of obesity status, diet management, healthcare, and self-diagnosis. The obesity status service is to manage the user’s obesity and provides the services of obesity measurement, BMI measurement, abdominal obesity measurement,

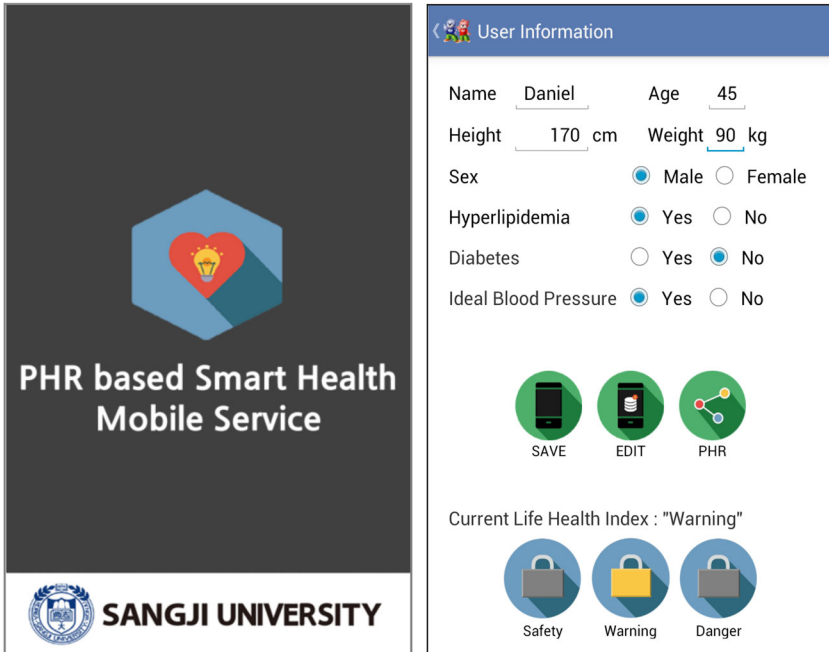


Fig. 5 Initial screen of PHR-based smart health mobile service application

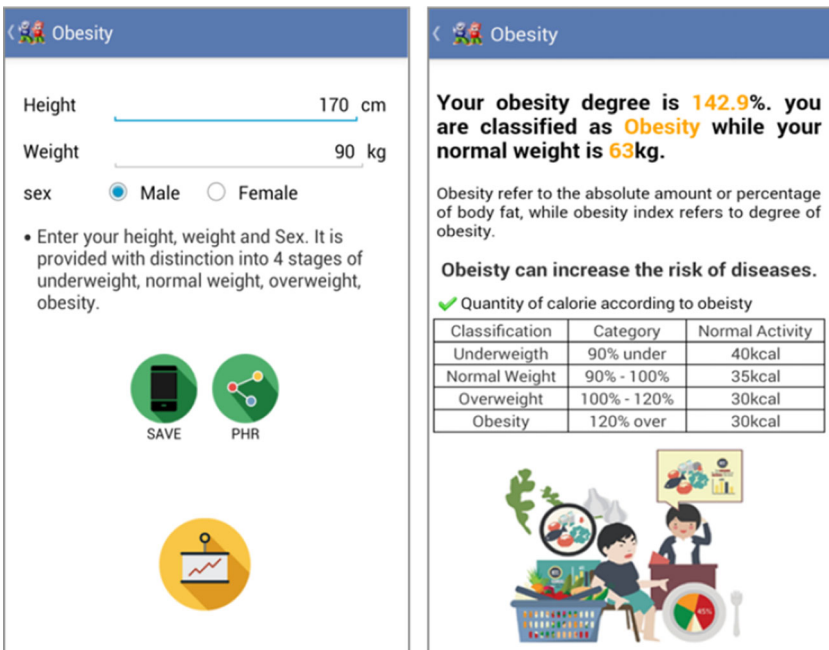


Fig. 6 Obesity measurement and measurement results

obesity risk measurement, dietary recommendation by obesity risk, dietary recommendation by eating habits [6, 44]. Figure 5 shows the initial screen and user information input screen of PHR-based smart health mobile service application. If running life health index mobile service, user information input window will appear. If entering name, age, height, weight, sex, hypertension, diabetes, hyperlipemia in the user information input window and selecting SAVE icon, the information of the application user will be entered. Also, if selecting PHR icon, user's life health index is calculated and served in the 3 stages of danger, alert, safety through the decision support model of automatically receiving and proposing PHR information from PHR platform gateway.

Obesity measurement calculates entered height, weight and sex of the user and classifies and serves the result into the four stages of underweight, normal weight, overweight, obesity. Obesity measurement results are indicated as percentage (%) and obesity status can be determined according to categories. Also, if selecting PHR icon, the user's height, weight and sex are automatically entered and the degree of obesity and calorie consumption depending on the degree of obesity are served. Figure 6 shows obesity measurement and measurement results.

PHR-based smart health mobile service can measure the user's BMI. BMI can be measured based on the user's height, weight and sex. BMI measurement is a formula for

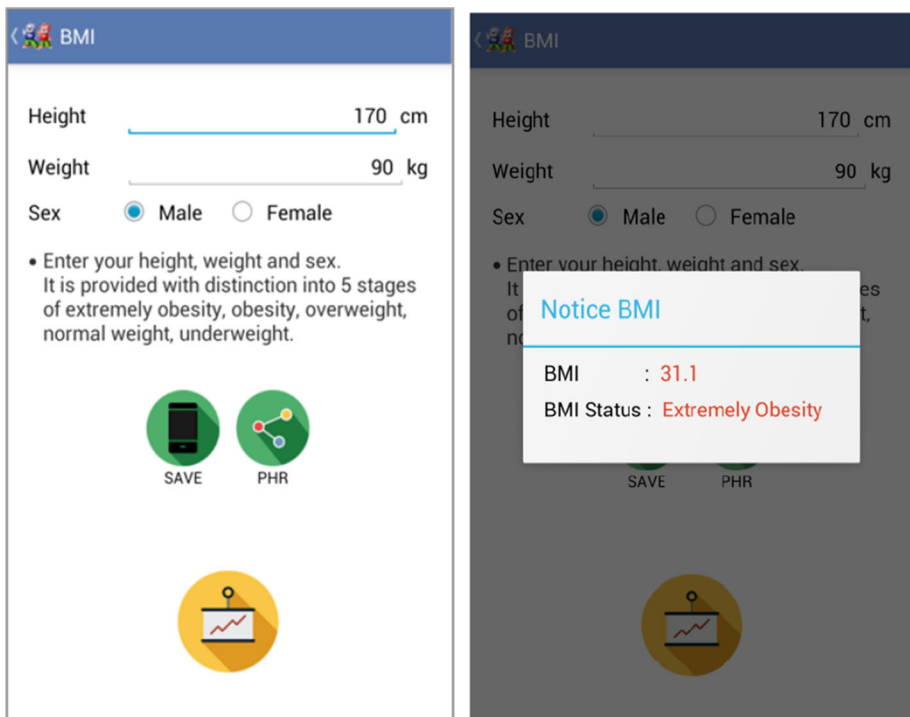
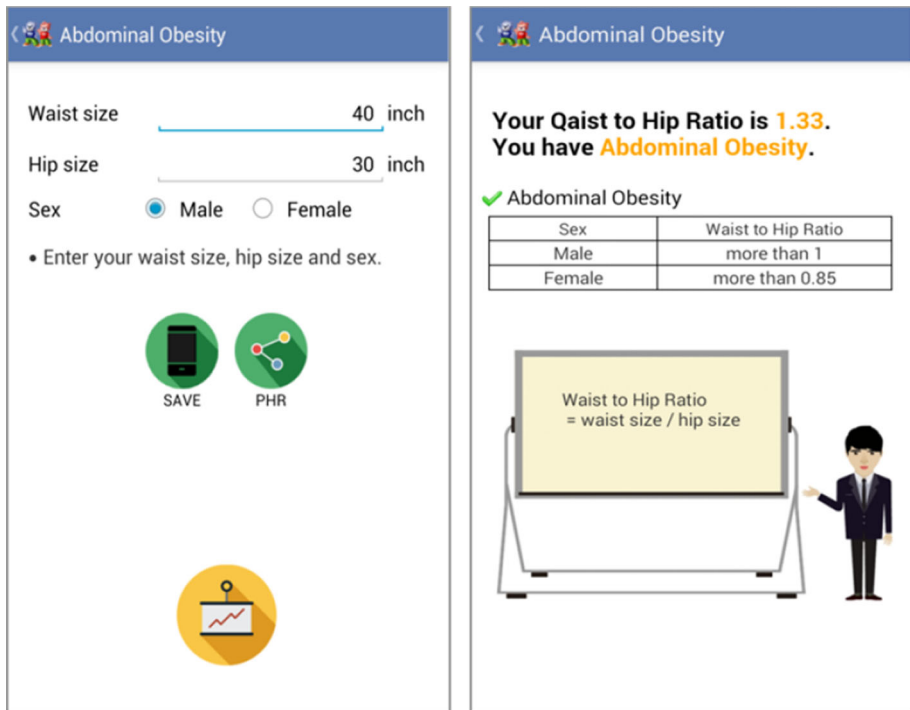


Fig. 7 BMI measurement and BMI measurement results



**Fig. 8** Abdominal obesity and abdominal obesity measurement results

estimating the user's fat amount by using height, weight and sex and indicates the index reflecting the percentage of body fat and health risk. BMI classifies the user's weight state into underweight, normal weight, overweight, obesity, extreme obesity and serves it with BMI. Also, if selecting PHR icon for BMI measurement, height and weight are automatically entered and BMI measurement service is available. Figure 7 shows BMI measurement and measurement results screen.

Figure 8 shows abdominal obesity and abdominal obesity measurement results. Abdominal obesity is measured by using entered waist circumference, hip circumference and sex of the user. The measurement results of abdominal obesity are based on value 1 and men are regarded as abdominal obesity of the value is higher than 1 and more than 0.85 is indicated as abdominal obesity in the case of women. Abdominal obesity can be also entered and served automatically by selecting PHR icon.

Figure 9 shows obesity risk measurement and obesity risk index measurement results. The obesity risk index is measured by using entered sex, obesity family history, age, weight, height, waist circumference, hip circumference of the user. The obesity risk index is calculated based on obesity risk and BMI, abdominal obesity, obesity family history and classified and served into 4 stages of danger, alert, medium, low. Obesity risk measurement and obesity risk index measurement results can be also entered automatically by using PHR icon.

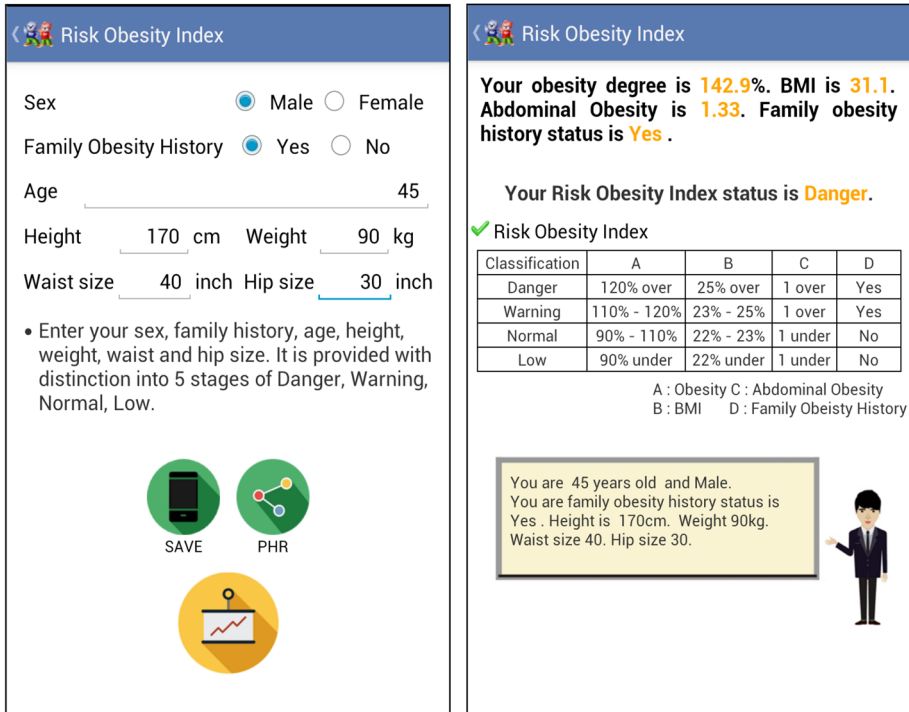


Fig. 9 Obesity risk measurement and obesity risk index measurement results

### 5 Conclusions

Modern society is changing rapidly due to the development of IT convergence technology and various studies on healthcare have been actively carried out by applying information technology to health and medical treatment. In particular, as diseases themselves are being turned from acute disease to chronic diseases due to aging of population, efficient and systematic healthcare has been recognized as the most important part in the health and medical treatment field. This paper proposed PHR-based health index mobile service using a decision support model. As the proposed method, we carried out Multivariate analysis for health index related factors based on data of the national health and nutrition survey and decision support modeling by using the decision support tool of R. In order to serve the user’s health index according to the decision support model, mobile application was developed and implemented for easy management and service in mobile application by using PHR information to manage user information easily. Unlike existing broad and uniform service health index through web, PHR-based health index mobile service using the decision support model enables user customized personalized health index service and health information and health index can be continuously served via a mobile and portable terminal regardless of the user’s location. It is of significance in that the current health status can be easily checked through the health index measured by implementing personalized user customized healthcare service and individual service can be provided to users in the mobile environment. The proposed PHR-based health index mobile service

using the decision support model is expected to contribute to health promotion by providing effective services to users in U-health environment.

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