How the Awareness of u-Healthcare Service and Health Conditions Affect Healthy Lifestyle: An Empirical Analysis Based on a u-Healthcare Service Experience

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Abstract

Objective: The objectives of this study are (1) to establish a ubiquitous healthcare (u-healthcare) center for those who wish to use u-healthcare, allowing them to experience the service, and (2) to evaluate the users' awareness and expectations of the service based on their overall assessment. **Materials and Methods:** To establish the u-healthcare center, a kiosk, devices for health checkup, a body-type examination system, and a physical fitness assessment system were installed. Also, a u-healthcare Web site was developed. A survey was conducted on 280 individuals who visited the u-healthcare center and used the service, to determine (1) individual awareness of u-healthcare before using the service and their change of perception after use, (2) factors that affect the use of u-healthcare, and (3) the effects of disease awareness on exercise habits. **Results:** Only 25.4% of the participants were aware of u-healthcare, and only 36% who saw the u-healthcare center recognized that it was where the u-healthcare service was provided. The group of individuals who were willing to use the u-healthcare showed statistically significant differences in their satisfaction with the overall environment of the center, as well as the specificity of the descriptions, examination results, kindness of the staff, and their responses. Additionally, the group of individuals who were diagnosed with chronic diseases and the group who were not showed statistically significant differences in the number of days on which they exercised lightly or took a walk. **Conclusions:** To promote the usage of u-healthcare service, the understanding of the service and the credibility of examination results need to be increased by sharing successful cases. Furthermore, to expand the use of the system that allows a person to regularly check his or her state of health, a lifelong periodical management system linked with another medical welfare program will be needed.

Key words: ubiquitous healthcare service center, Web-based healthcare service, health promotion, awareness of health condition

Introduction

Ubiquitous healthcare (u-healthcare) combines medical as well as telecommunications technology and information technology (IT) to provide medical services for prevention, diagnosis, treatment, and follow-up management, without being restricted by time or distance. The system arose with the development of IT, aging of the population, and increase in numbers of patients with chronic illness.¹⁻⁵ U-healthcare started to gain attention as a way of alleviating the problems associated with an aging population. Recently, the aging population has started to increase rapidly, resulting in an increased medical cost burden and a need to alleviate this by effective management of chronic illness and health.^{6,7}

In particular, the recent development of telecommunications technology and IT allows for different types of medical services to be provided. A communications network is used to provide telemedicine, allowing a team of medical staff to relay medical information to each other and to provide consultations to the patients, collaboratively. Furthermore, a service that provides various kinds of medical information using Internet Web sites has emerged. In addition, the development of various microscopic sensors and wired and wireless communications has allowed the development of the u-healthcare service, which provides management of health and disease anytime and anywhere, changing the paradigm of medical service from disease diagnosis and treatment to prevention and management.^{3,5,6} An optimal u-healthcare environment is required by an aging society for the well-being of its members.⁸⁻¹⁰

To satisfy this societal requirement, the government and private organizations are policing the u-healthcare industry and preparing countermeasures to an aging society by supporting various u-healthcare services.^{1,2} In South Korea, the evaluation of simple techniques using telemedicine demonstration projects has been conducted since the 1990s. Additionally, since the medical reform in the early 2000s, the demonstration projects that revolved around these simple techniques have evolved to become projects focusing on public health services, following the demand.^{2,11}

However, although the u-healthcare service has been provided by universities, hospitals, and IT enterprises since the early 2000s, the market for u-healthcare has yet to show a remarkable growth. In particular, the IT-related u-healthcare service is not well known among the public.¹²⁻¹⁴ Furthermore, the current demand for the u-healthcare industry is created solely by the demonstration projects carried out by the government, reflecting the evidently unsuccessful industry.¹⁵

Public sector u-healthcare demonstration projects are divided as follows: the ubiquitous Medical Service, which is a telemedicine service targeting individuals who are distant from medical services, such as residents of remote places, prisoners, the military, and the police; the ubiquitous Silver Service, which targets senior citizens who live alone or in nursing homes; and the ubiquitous Wellness Service, which is a health-promotion service. Of these, the ubiquitous Medical Service had 49 services open until 2009, but only five services are operating currently. Likewise, of four ubiquitous Silver Services, only two are operating currently.¹⁶ Lack of connection between related services and physicians, lack of awareness of the service or products among patients, and institutional limitations are identified as causes of the system's lack of success.¹⁷ Although an understanding of the system's limitations and knowledge of solutions to these are needed, there is a lack of research and support about measures that can improve the quality of the service and promote its use.⁸

Studies evaluating the u-healthcare service can be broadly divided into two types: first, studies that focused on cost reduction and verification of its clinical effectiveness; and second, those that focused on the users' satisfaction with the service and their intentions of using the service.

The following studies focused on the cost reduction and clinical effectiveness of the service. Wade et al.¹⁸ conducted systemic analysis of the economic feasibility of u-healthcare. Similar studies mainly demonstrated the clinical effectiveness of u-healthcare on hypertension- or diabetes-related chronic diseases.^{19–22} Other studies analyzed the economic effect of in-home disease care using the u-healthcare system.^{23–28} Kang and Lee²⁹ conducted a cost-benefit analysis based on data from the national health insurance service, the Korean National Health and Nutrition Examination Survey, and research results of remote patient monitoring from outside the country. Lee³⁰ emphasized the necessity for an in-depth examination of the economic feasibility and validity of telemedicine based on its performance, cost, and benefit. Cho et al.¹⁷ conducted a comparative analysis of the patient satisfaction and clinical effectiveness of diabetes management using a cellular phone and the Internet. Yim et al.³¹ suggested that a u-healthcare system is effective for the management of hypoglycemia, which is a key problem in elderly patients with diabetes. Lee and Kim³² investigated whether u-healthcare devices are operating well, if wireless data acquisition and monitoring are performed smoothly, and if u-healthcare devices and services can help with users' health management.

Second, studies about the users' satisfaction and their intended use of the service are as follows. Woo⁸ conducted a survey analysis on factors of u-healthcare service that affect the user awareness of the service. Kang et al.¹² analyzed the awareness of u-healthcare services that were provided by universities, hospitals, and IT enterprises in 2005 and published in 2007; they concluded that most IT-related u-healthcare services were not well

known. Jeong¹⁵ identified lack of connections to physicians, lack of awareness of the products and services among patients, and institutional limitations as flaws of the u-healthcare industry. Cho et al.¹⁷ devised a hypothesis suggesting that the lack of awareness was a key factor in the future prospects of u-healthcare. Davis et al.³³ used the Technology Acceptance Model (TAM) to study the intended use of u-healthcare. Wu et al.³⁴ investigated the acceptance factors for mobile computing in the u-healthcare industry. Jung and Berthon³⁵ also studied factors that impact the successful use of u-healthcare service using TAM, and Choi et al.³⁶ studied the acceptance factors of the service using TAM. Lee and Jang^{37,38} studied factors that affect the intended use of u-healthcare service.

As shown, previous studies focused on cost reduction and clinical effectiveness. In addition, most studies that investigated the customer satisfaction or intended use were conducted with participants who had not experienced u-healthcare and were only informed about the service by reading descriptions or reference materials. Because these studies were conducted without practical experience of the u-healthcare service by the participants, the overall assessment of the service, including the service awareness, satisfaction, or usability, cannot be performed. Furthermore, most of these studies merely summarized previous research and examples to devise strategies that u-healthcare should pursue.

For this study, we established a u-healthcare service center at which the participants could personally experience u-healthcare service. Additionally, by studying how the u-healthcare service is used and perceived by the users, potential strategies for the u-healthcare service will be examined. The objectives of this study are (1) to establish a u-healthcare center for those who wish to use u-healthcare, allowing them to experience the service, and (2) to evaluate the users' awareness and expectations of the service based on their overall assessment and to formulate a plan on how to promote use of the u-healthcare service, by analyzing the effect of understanding one's health status on his or her lifestyle.

Fig. 1. Concept map of the ubiquitous healthcare (u-healthcare) system.

Table 1. Ubiquitous Healthcare Center Equipment

MEASURING DEVICE	DESCRIPTION	APPEARANCE
Registration kiosk	<ul style="list-style-type: none"> Register as a member: a member identification card (barcode or RFID card) for the health examination system is issued. Log-in using the member identification card. Send personal information to the examination system and create a wait-list for the measurements.
Health checkup system	<ul style="list-style-type: none"> Items examined: blood glucose level, blood pressure Analysis of the measured items and provide a trend graph Accumulated data are also provided. The data are sent to an exclusive server so that the results can be viewed via Internet protocol TV.
Body-type examination system	<ul style="list-style-type: none"> Items examined: weight, body fat, body balance One's result on examining the body balance is shown through a TV screen installed in front of the device. Conduct a lifestyle survey through the screen
Physical fitness assessment system	<ul style="list-style-type: none"> Items examined: muscular strength, endurance, and reactivity; agility; cardiovascular endurance; grip power Average examination time is 10 min. Watch a video on the specifics of the examination through a screen

stationed to help those having difficulties with the devices. The u-healthcare measuring system is composed of (1) the member registration kiosk, (2) health checkup system, (3) physical fitness assessment system, and (4) body-type examination system, as shown in *Table 1*. One can register as a member, receive a member card, and log-in to check the personal information and examination results at the kiosk. Additionally, it shows the wait time for each device, allowing more efficient use of the devices. The health checkup system lets the user measure his or her blood glucose level and blood pressure, and the body-type examination system measures the weight, body fat, and body balance. The physical fitness assessment system measures the muscular strength, muscular endurance, reactivity, agility, cardiovascular endurance, and grip power. All examination results are compared with statistics categorized by gender and age, and the users are ranked based on their fitness. The results are sent to an exclusive server and received by a connected specialized medical institution, at which a professional uses a

Materials and Methods

As shown in *Figure 1*, the established system is based on service-oriented architecture and comprises four systems: a u-healthcare service center equipped with u-healthcare service devices; a central database; a linked system with cooperating medical institutions, which can prescribe suitable exercise routines; and a Web service with which the users can check their results. The user registers as a member at the registration kiosk and receives a member identification card upon entering the u-healthcare center. Users then check for their stand-by order and wait time on a display monitor. They can choose the device with the shortest waiting time displayed by the kiosk. The device reads and sends their member information to the measuring system. Once the device makes a measurement, the users can check the examination result immediately on an on-site monitor. They can also check the results by logging onto a home page using the Internet or a smartphone.

IMPLEMENTATION OF U-HEALTHCARE CENTER

Considering that the elderly are more likely to use the u-healthcare system, an assistant was

software system for u-healthcare specialists to prescribe personalized exercise programs.

Personal examination results from the u-healthcare center and connected hospitals can be checked online at any time, using not only a computer but also Internet protocol TV or smartphones. Additionally, information about the necessary health contents (muscle strengthening exercise, stretching program, etc.), exercise

Fig. 2. Views of the ubiquitous healthcare center.

Fig. 3. Web-based health management system.

precautions, nutrition management, and relevant illnesses is available through bilateral contents and feedback and can be used to better manage one's health.

Figure 2 shows an example of a u-healthcare center established in a park. This u-healthcare center was constructed at the entrance of a hiking trail in Sungji Park, Busan, Korea. The average daily visiting population is around 120 people, with over 400 people visiting regularly during weekends.

A WEB-BASED HEALTH MANAGEMENT SYSTEM

Via the Web-based health management system developed for the u-healthcare service, users or physicians can access measurement results by logging onto the Web site. When the automatic diagnosis system places a user under a high-risk category, the system's messaging function automatically delivers the examination results to the physician and sends a message to the user that a prescription is being prepared by the physician, as shown in Figure 3. A message containing the physician's prescription is then sent to the user. The physician may also send a visit request message if one is deemed necessary.

DIAGNOSIS AND PRESCRIPTION SYSTEM

Various parameters that can be measured at a u-healthcare center are categorized into those measured by health devices and those personally entered by users themselves through a computerized self-administered questionnaire. As shown in Figure 4, data that are collected through measuring devices (e.g., data on blood pressure, blood glucose, body mass index, balance, and physical fitness) are assessed to determine whether they deviate from normal ranges. If assessment results are determined to fall under the high-risk category, the user is notified of his or her current measurements and high-risk status. At the same time, the measurements concerned are sent to the physician in charge, who then checks the measurements on the Web site and provides the user with a prescription. The physician's prescription is sent to the user via a mobile message. If prescribing via a mobile message cannot be implemented, a message recommending a visit to the clinic may be sent instead. The system provides automatic prescriptions in cases where device-measured values can be improved by changing eating or exercise habits and for user health statuses determined on the basis of responses to the questionnaire survey conducted through the lifestyle checkup system. Prescriptions regarding exercise, eating, and sleeping habits are modeled on those of Heyward.³⁹ Furthermore, quitting drinking or smoking is recommended where applicable.

The data gathered from the u-healthcare center can be managed in the form of an online diary on the Web site (Fig. 5). The users can directly type in data, such as their height or the number of steps they walked on a specific day, and monitor their own health behavior through the Web system. This system can also serve as a social network or social support system. There is a specific registration for doctors and experts and family members or guardians. Doctors or experts can check on and help manage a user's health status by giving behavior prescriptions or advice periodically via e-mail. Family members or significant others can use the site as a network to build an online social support system by being able to monitor and motivate

Fig. 4. Diagnosis system. BMI, body mass index.

Fig. 5. Ubiquitous healthcare Web site: (a) health diary and report and (b) health information service (HIMS). BMI, body mass index; BP, blood pressure; PNF, proprioceptive neuromuscular facilitation.

the users constantly, for both regular checkups and behavior changes. With the contents included on the Web site and links to other materials, the Web site can also provide a variety of health information such as how to exercise appropriately and how to eat healthily.

APPLICATION

A survey was conducted on 313 people who visited the u-healthcare center from October 18 to November 3, 2013. Excluding 33 individuals with incomplete responses or outliers, in total, 280

surveys were analyzed. Statistical analysis was conducted using SPSS version 15.0 software (SPSS, Inc., Chicago, IL), and the demographic characteristics of the 280 individuals are shown in Table 2.

To examine the effect of u-healthcare service awareness and individual state of health or disease on exercise habits, a survey was conducted and analyzed based on the following three categories.

The awareness of u-healthcare service before, and the change of perception after, using the service. To investigate the awareness of u-healthcare service, the five items (Q1–Q5) of Table 3 were addressed before subjects used the u-healthcare service. To investigate the change of perception after using the service, six items (Q6–Q11) were addressed. Descriptive statistical analysis was conducted on each item, and the specific survey questions were as shown in Table 3.

Factors that affect the use of u-healthcare service. To deduce factors that may have an effect on the use of the u-healthcare service, 15 items (Q12–Q26) in Table 3 were addressed. To analyze differences in the perception of the u-healthcare service environment, service, and satisfaction with the staff between the group of individuals who were willing to continue the use of u-healthcare service and the group who were not, participants from each group were asked to provide their answers on a 5-point scale. A *t* test was conducted.

The effects of disease awareness on exercise habits. To analyze the effects of disease awareness on exercise habits, four items (Q27–Q30) in Table 3 were addressed. To analyze the differences in the number of days participants exercised heavily or lightly or took a walk, individuals who either have chronic illness or

have been diagnosed as having a high risk of chronic illness, and individuals who were not, were asked to provide their answers on a 5-point scale. A *t* test was then conducted.

Results and Discussion

AWARENESS OF U-HEALTHCARE SERVICE

Despite the fact that the term “u-healthcare” has been used in South Korea for over 10 years, only 25.4% of the participants said they had heard of it. This suggested that the term “u-healthcare”

Table 2. Demographic Characteristics

DIVISION	FREQUENCY	%
Gender		
Male	98	35.0
Female	182	65.0
Total	280	100
Occupation		
Housewife	93	33.2
Administrative	36	12.9
Sales/service	29	10.4
Managerial	9	3.2
Specialized technical	23	8.2
Production	12	4.3
Technical	11	3.9
Professional	19	6.8
Entrepreneurial	26	9.3
None	7	2.5
None of the above	15	5.4
Total	280	100
Age (years)		
20–29	11	3.9
30–39	20	7.1
40–49	38	13.6
50–59	116	41.4
60–69	73	26.1
70+	22	7.9
Total	280	100
Highest level of education		
Not schooled	3	1.1
Elementary school	19	6.8
Middle school	49	17.5
High school	119	42.5
Undergraduate	82	29.3
Graduate degree	8	2.9
Total	280	100

was still unknown to the citizens. Only 36% of the participants who visited the u-healthcare center were aware that this was where u-healthcare service was being provided. Furthermore, 56% of the participants answered “never visited” when asked how often they use the service after learning about the center. Additionally, 88% of the participants who knew of the existence of the u-healthcare center in the park responded that they “saw the center while passing through the park.” This result showed that, rather than promoting the center through local government, the Internet, or various media, physical prominence is more effective, emphasizing the importance of building noticeable u-healthcare centers. A total of 63.9% of the participants said the purpose of visiting was for a health checkup or consultation, whereas 22.1% of them visited solely out of curiosity. Based on these statistics, it is estimated that although many people are interested in receiving health checkups or consults, a proportion of citizens still feel unaware about the service and lack the interest and motivation to use the service.

After using the u-healthcare service, 96.4% of the participants thought the service was helpful for the overall management of their health. However, 2.5% of the participants thought otherwise. Additionally, 93.6% of the participants said “yes” when asked if their interest toward the service had increased after using it. Furthermore, 95.7% of them said they would recommend the u-healthcare center to their family. Those who answered that they would not recommend the center or would not use the service again said “the environment was inadequate,” “it was difficult to use the devices,” and/or “the staff were unfriendly.” The participants answered that the advantages of using the u-healthcare service over that of other medical institutions were “it is easily approachable,” “there is no financial burden as the service is free,” “the measurements are simple and fun,” and “the results of health management are provided.” Finally, the participants said that the u-healthcare center can be improved by “moving the center to the entrance of the park for easier access,” “printing out the results for the users,” and “holding educational sessions on how to improve one’s health,” as well as “increasing the number of staff, and providing close management.”

FACTORS THAT AFFECT THE USE OF THE U-HEALTHCARE SERVICE

User satisfaction was analyzed separately for the group of individuals who were willing to use the u-healthcare service in the future and the group who were not. First, after participants were asked about their willingness to continue visiting the u-healthcare center (Q12) and a *t* test was conducted on 14 questions that were related to u-healthcare user satisfaction, eight questions showed statistically significant (>95%) differences (Q14, Q17–Q19, Q21, Q23, Q24, and Q26).

As Table 4 shows, the group of individuals who were willing to reuse the u-healthcare service were highly satisfied with the location, cleanliness, environment, detailed and comprehensible descriptions, the examination results, and the friendliness of the

Table 3. Survey Questions on Ubiquitous Healthcare Service Utilization Patterns and Lifestyle for Ubiquitous Healthcare Service Users

1. u-Healthcare service awareness
Before using the u-healthcare service
Q1. Have you ever heard of "u-healthcare service"?
Q2. Were you aware that there was a u-healthcare service center in the park?
Q3. How often do you visit the u-healthcare service center after learning of its existence?
Q4. How did you find out that there is a u-healthcare center in the park?
Q5. What is your purpose of visiting the u-healthcare center?
After using the u-healthcare service
Q6. Do you think the u-healthcare service is useful for overall management of your health?
Q7. After using the service, was your interest toward your health status increased?
Q8. Would you recommend the u-healthcare service to your family and relatives?
Q9. If you are not willing to use the u-healthcare service, please state why.
Q10. What is an advantage of using the u-healthcare service over other medical services?
Q11. How can the u-healthcare service improve?
2. User satisfaction for the u-healthcare center
Q12. Are you willing to keep visiting the u-healthcare center?
Q13. Do you think the center is advertised and/or promoted well?
Q14. Do you think the current location of the center is appropriate?
Q15. Are you satisfied with the area of the center?
Q16. Do you think the devices and internal environment are clean and well organized?
Q17. Are you satisfied with the overall environment of the center?
Q18. Were the devices easy to utilize?
Q19. Were you satisfied with the process of registration?
Q20. Were you satisfied with the wait-time for the devices?
Q21. Do you trust the examination results?
Q22. Were you satisfied with the overall procedure?
Q23. Was the exercise prescriber friendly?
Q24. Were you satisfied with their responses to your questions during the examination?
Q25. Do you think the number of staff stationed is appropriate?
Q26. Were you satisfied with the overall service provided by the staff?

Table 3. continued

3. Chronic illness and exercise habits
Q27. Do you have a chronic illness or have been diagnosed as having high risk for a chronic illness?
Q28. During the last 7 days, for how many days did you exercise heavily, including heavy lifting, running, aerobics, riding a bicycle in high speed, etc.?
Q29. During the last 7 days, for how many days did you exercise intermediately, including light lifting, riding a bicycle in medium speed, playing doubles tennis, etc.?
Q30. During the last 7 days, for how many days did you walk for at least 10 minutes at one go?

staff and the usefulness of their answers. To increase users' willingness to use the service, the exposure to u-healthcare service, improvement of the center's visibility, and providing satisfactory health checkups and consultations to those who visit the center out of curiosity need to be sequentially implemented. Another outcome that should not be overlooked is the importance of providing assistance to those who are unfamiliar with the u-healthcare service; although the u-healthcare service enables one to take care of one's health independently by using the ubiquitous technology, the study showed that the participants were affected by the friendliness of the staff and their ability to answer questions. As such, a workforce will still be needed to allow the users to use the u-healthcare service more easily and conveniently, until the service takes root and spreads throughout the country.

THE EFFECTS OF DISEASE AWARENESS ON EXERCISE HABITS

To analyze the effects of disease awareness on exercise habits, average exercise days were determined for the group of individuals with chronic illness and the group without, as shown in Table 5. First, the group whose participants were diagnosed with chronic illness showed statistically significant differences in the number of days on which they exercised lightly and/or took a walk, compared with the group whose participants were not. In other words, the group that was diagnosed exercised more often than the group that was not. Similarly, individuals who were diagnosed as being in a state of poor health exercised more than the individuals who were diagnosed to be in a better state of health. This result shows that being aware of one's health condition changes one's exercise habit. In Table 4, the lack of difference in heavy exercise may be explained by the fact that the u-healthcare center was built at the entrance of a hiking trail, resulting in the average age of the users being 50–60 years of age; thus, the older participants were unlikely to show a large difference in heavy exercise habits (heavy lifting, running, aerobics, or cycling at high speed).

Table 4. Differences in the Satisfaction of the Individuals Based on Their Willingness to Revisit the Ubiquitous Healthcare Center

	T TEST				GROUP AVERAGE	
	T	DF	P VALUE	AVERAGE DIFFERENCE	WILLING TO REVISIT	UNWILLING TO REVISIT
Q13. Advertise	1.481	249	0.140	0.357	3.58±0.989	3.22±0.943
Q14. Location	1.889 ^a	252	0.060	0.356	3.80±0.771	3.44±0.784
Q15. Scale	0.067	253	0.947	0.015	3.46±0.959	3.44±0.705
Q16. Register process	0.864	255	0.388	0.165	3.85±0.808	3.68±0.671
Q17. Clean	2.551 ^a	257	0.011	0.365	4.15±0.597	3.79±0.631
Q18. Environment	2.442 ^a	255	0.015	0.362	4.05±0.618	3.68±0.671
Q19. Usability	2.455 ^a	252	0.015	0.359	4.15±0.598	3.79±0.787
Q20. Waiting time	0.251	259	0.802	0.046	3.85±0.804	3.80±0.696
Q21. Report satisfaction	2.407 ^a	250	0.017	0.474	4.14±0.793	3.67±0.970
Q22. User's process	1.430	253	0.154	0.293	4.03±0.848	3.74±0.991
Q23. Kindness of employee	3.027 ^a	248	0.003	0.487	4.19±0.638	3.71±0.686
Q24. Response of employee	3.136 ^a	254	0.002	0.536	4.15±0.687	3.61±0.850
Q25. Number of employee	0.523	253	0.602	0.104	3.88±0.825	3.78±0.647
Q26. Service satisfaction	2.384 ^a	254	0.018	0.381	4.21±0.656	3.83±0.618

^aStatistically different value.

Conclusions

U-healthcare is receiving attention as a result of socioeconomic factors such as an increase in interest concerning one's health, the change in healthcare paradigm from diagnosis and treatment to prevention and management, changes in the population dynamics, and a deficit of healthcare professionals. The service is estimated to be a critical technology that can alleviate the various societal problems associated with an aging population. As such, the objective of this study was to propose strategies that the u-healthcare service can implement by analyzing the user perception of u-healthcare service through establishing a u-healthcare center where the users could personally experience the service. This study conducted an empirical analysis of 280 individuals who visited the u-healthcare center.

The analysis results can be summarized as follows. First, the citizens still feel unfamiliar with the term "u-healthcare service," despite the fact that the u-healthcare service was established over a decade ago, and they lack interest toward and intent to use the service. Therefore, an active strategy for the promotion of the center is needed. Second, individuals who were willing to use the u-healthcare service and those who were not were affected by the location and environment of the center, satisfaction with the examination results, and the detailed and clear descriptions of the service. Hence, sharing successful cases and increasing the credibility of the examination results are strategies to increase the understanding of the service and promote its use. Lastly, it was shown that individuals who are precisely aware of their health status exercise more, to

Table 5. Differences in the Exercise Habits of the Group of Participants Who Were Diagnosed with Chronic Illness and the Group of Participants Who Were Not

	T TEST				GROUP AVERAGE	
	T	DF	P VALUE	AVERAGE DIFFERENCE	CHRONIC ILLNESS	NOT DIAGNOSED
Q28. Heavy exercise	-0.013	258	0.990	-0.003	1.12±1.681	1.12±1.718
Q29. Light exercise	2.219 ^a	253	0.027	0.485	1.45±1.940	0.97±1.542
Q30. Walking	2.755 ^a	242	0.006	0.814	4.72±2.165	3.91±2.366

^aStatistically different value.

manage their health. As such, developing a system that allows one to regularly check and stay aware of one's health is important. Furthermore, a system that provides regular and lifelong health management by connecting to other medical welfare programs is needed.

This study is meaningful in that it analyzed and verified the effects of the awareness of u-healthcare service on one's health by constructing a u-healthcare service center at which the users could experience the service. The data from this study are expected to be useful for establishing and expanding u-healthcare service centers. However, this study was conducted on the hiking trail of a park, and hence over 65% of the participants fell into the age group of 50–60 years, with one of their demographic characteristics being an interest in hiking. Therefore, conducting a study with participants from various backgrounds will produce more meaningful results. Furthermore, developing various indexes of management for the u-healthcare service can point the u-healthcare research in a more meaningful direction.

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