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THE EFFECTS OF UNIVERSITY STUDENTS' E-HEALTH LITERACY AND DIGITAL HEALTHCARE USAGE INTENTION ON HEALTH PROMOTION BEHAVIOR

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ABSTRACT

This study attempted to provide basic data on college students' health by identifying the factors that influence college students' ability to understand Internet health information and their intention to use digital healthcare on their health promotion behaviors. Data were collected from April 1 to July 30, 2022, and a survey was conducted with the consent of the subjects. The number of participants used in the final analysis was 152. The questionnaire consisted of sociodemographic characteristics, Internet health information literacy, intention to use digital healthcare, and health promotion behaviors. The collected data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation, and multiple regression using the SPSS 21.0 statistical program. As a result of this study, differences in Internet health information understanding ability according to general characteristics were related to class, proficiency in using health-related apps, and experience using health information apps. Differences in intention to use digital healthcare were related to proficiency in using health-related apps and experience in using health-related apps. , differences in health promotion behaviors showed significant differences in satisfaction with major, part-time job, proficiency in using health-related apps, proficiency in using health-related apps, and personal personality. Additionally, the ability to understand internet health information and the intention to use digital healthcare showed a positive correlation with health promotion behavior. The results of the regression analysis showed that the factors influencing health promotion behavior were intention to use digital healthcare and ability to understand internet health information, and the personality of the person appeared to have a conflicting effect on health promotion behavior. The factors used in the analysis were found to explain 26.7% of the factors affecting health promotion behavior of college students.

Keywords: Keyword1, health promotion behavior, e-health literacy, intention to use digital healthcare, university students

1. INTRODUCTION

Health promotion behavior refers to behavior that expresses the tendency to achieve optimal levels of well-being, personal achievement, and productive life [1]. College students can be said to be an age group with a greater possibility of modification compared to adults because health risk behaviors are before they become established. Therefore, it is important to check one's health status and establish health promotion behaviors during this period [2, 3, 4]. In order to promote health promotion, it is necessary to search for and properly utilize reliable information related to health.

Recently, as smartphones have become widespread, health-related knowledge is being acquired through the Internet [5]. According to a 2018 survey on internet usage by the Korea Internet & Security Agency, the internet use rate among the population aged 3 and older in Korea was 91.5%. Among college students in their 20s, along with those in their teens and 30s, the usage rate was 99.9%, and the main purpose of using the Internet was to acquire data and information at 89.1% [6]. This trend gave rise to the concept of 'e-Health', which refers to the use of new information and communication technologies, namely the Internet, for health and medical services [7]. However, in the field of health and medical services, the use of incorrect health information can actually cause serious damage, so finding, understanding, and utilizing correct health information can be said to be a very important task [8]. The expanded concept of 'e-Health Literacy' here means "the ability to find, understand, evaluate, and apply health information from the Internet" [9]. In academia, there is no agreed upon terminology related to this, and it is used interchangeably as 'media health literacy', 'e-health literacy', and 'digital health literacy'. In this study, it is unified and used as 'Internet health information literacy.'

Experiencing the COVID-19 pandemic, college students' use of information via the Internet has rapidly increased [10, 11, 12]. University classes, corporate and business meetings, and daily gatherings between individuals were replaced online, and most of the information needed for daily life was distributed online. A recent German study [13] reported that college students with low levels of Internet health information comprehension were highly confused about COVID-19 information. In a study targeting Pakistani college students [14], the higher the ability to understand internet health information, the more likely they were to engage in health promotion behaviors related to COVID-19. An American study [15] found that college students with high Internet health information literacy had a higher willingness to receive the COVID-19 vaccine.

The development of information and communication technology has had a significant impact in changing the concept and scope of literacy from traditional print media to digital [16]. Accordingly, the concept of traditional literacy, which refers to the ability or knowledge to read and write, has been expanded to digital literacy, which refers to various forms of literal communication based on information and communication technology [17].

The framework for 21st century learning established by the P21 Committee (The Partnership for 21st Century Learning) in the United States includes communication, critical thinking, creativity, collaboration, and digital capabilities as core competencies. Literacy is included. Digital literacy consists of information literacy, media literacy, and ICT literacy and is presented as one of the important competencies for learning in the 21st century [18]. In particular, as the non-face-to-face transition has accelerated recently due to COVID-19, it is now a skill that every member of society must have, to the extent that it is called a 'survival skill', and the importance of digital literacy has emerged as a core competency in future society. It is becoming [18].

In the current era, the concept of digital literacy that emphasizes active use and participation is being emphasized [19]. The concept of digital literacy, which is currently commonly used, was introduced in the book "Digital Literacy" by Gilster [20]. Gilster said that digital literacy is "used to properly evaluate the value of information found on the Internet [20]. In other words, it is the critical thinking ability required from users and the ability to understand various types of information found from various sources, combine them into new information suitable for purpose, and use it correctly."[20].

Initially, research related to digital literacy focused on information and technological use. As information and communications have developed, emphasis has been placed on the critical ability to correctly select quality information among a large amount of information and interpret that information judiciously. Furthermore, it is expanding to the ability to have social influence that can be used in real life through acquired knowledge [21]. In particular, if you lack the ability to read and interpret media at the same time, you may be swayed by false information, harming your health, or promoting conflict between members of

society, which can lead to national and social problems, so interpreting critical thinking skills is important [22].

Previous research results report that using digital devices has beneficial effects such as building and maintaining social networks, resolving information inequality, and improving life satisfaction [23]. It was said that the higher the ability and level of information utilization, the more positive influence it has on life satisfaction [24].

Korea's high-speed Internet penetration rate and penetration speed are among the highest in the world, and with the advent of smartphones, accessibility to Internet use has greatly increased [25]. In Korea, the Internet utilization rate was 91.9% and the Internet access rate was 99.7%. The purpose of using the mobile Internet was mostly 'acquisition of data and information,' and more than half of mobile Internet users responded that their quality of life improved through the mobile Internet [26]. Individual Internet usage time has increased, and the rate of ‘on the move’ usage has decreased due to a decrease in external activities due to COVID-19, and this situation appears to have influenced Internet usage patterns [26].

Internet health information is information provided on the Internet and refers to comprehensive information that affects human health, introducing everything from specialized medical knowledge to health behaviors to improve the health of general health people [27]. Due to the development of smartphones, the Internet's role as a very important source of information related to personal health is increasing [28]. Many previous studies at home and abroad have revealed that the use of Internet health information leads to changes in behavior related to an individual's health [29].

61% of American adults use the Internet to obtain health information [30]. More than 60% of the Internet health information most used by adults was found to be disease and medication information [30], information about medical institutions, disease prevention information, and sex-related information [31]. It was reported that 35% of adults used the Internet to diagnose their health status [32].

In Korea, 84% of Internet users were reported to have experience using health information on the Internet [33]. The reality is that the Internet is becoming an important means for medical consumers to obtain health information [33]. However, since health information on the Internet cannot be controlled in advance, there may be problems with the quality of health information. The disadvantage is that there is no procedure to verify and control the health information produced, so there is a very high risk of unverified health information being distributed indiscriminately [34]. Additionally, the amount of online health information is so vast that it is not easy for users to select high-quality information on their own [35].

Users' trust in uncertain and incorrect health information may actually harm the health of online health information users [36]. A variable worth considering in the relationship between health-related behavior is an individual's attitude toward Internet health information, and the influence of attitude on behavior has already been demonstrated in the field of persuasive communication [29].

There are also domestic studies on e-health information literacy (digital health literacy) targeting college students [37]. According to Hwang A-reum et al., the e-health literacy of domestic college students was above the medium level (3.51 ± 0.5) out of 5, and by area, the ability to evaluate health information using the Internet was low [37]. According to a study by Cheon Hee-ran and others that looked at digital health literacy related to COVID-19, the average score of college students' overall digital health literacy was high at 2.98 (± 0.4) out of 4. However, 47.2% of students responded that they had difficulty in evaluating the reliability of Internet information. In addition, groups with high digital health literacy tended to have high preventive health behaviors, such as “participation in quarantine” or “intention to receive vaccination” [37]. In a socially protracted pandemic situation, it has been reported that college students are experiencing increased depression, anxiety, and helplessness [38], and that excessive use of YouTube is a risk factor in adjusting to college life [39].

According to Pender [41], health promotion behavior means that an individual has a peaceful psychological emotion and a positive attitude toward life in order to promote and improve health, and at the same time, dramatically engage in disease management activities [40]. In addition, health promotion is a practice carried out to help satisfy an individual's needs, and becomes the cornerstone of extending lifespan and improving the quality of life, including personal well-being, happiness, and self-actualization [41].

The health promotion model presented by Pender is the final result of health promotion activities and is also the result of action [40]. The path mentioned by Pender is a means of leading the subject to obtain positive results, and at the same time, when everything in life and lifestyle are integrated, the path can have a positive

impact throughout one's life [40]. This comprehensively includes concepts such as physical activity, health responsibility, nutrition, spiritual growth, interpersonal relationships, and stress management, and suggests health protection and promotion behaviors as elements of a healthy lifestyle [42]. Belloc and Breslow presented seven health-related habits as health-promoting behaviors: sleep time, regular exercise, meals, snacks, smoking, drinking, and weight status [43]. Some scholars have reported that if these health behaviors are thoroughly practiced, the average life expectancy can vary by up to 11 years [41].

With the growing interest in national health promotion, a wide range of studies on health promotion have been attempted, and various prior studies on public health issues are still ongoing [44]. Health promotion behaviors are influenced by an individual's physical and psychological characteristics, as well as the sociocultural background. Physical characteristics include physical conditions, gender, age, and athletic ability, psychological characteristics include self-esteem and personal motivation, and sociocultural background includes socioeconomic factors such as income and education level [44].

Meanwhile, digital healthcare can provide customized treatment by managing the patient's health status in real time without restrictions of time and place. In addition, the cooperation of multiple experts improves accessibility to medical services and expertise, providing systematic and high-quality treatment to patients [45]. This means that you will receive customized health care services, including disease management and prevention, anytime, anywhere. In this context, digital healthcare can be said to be a very innovative means for managing and preventing individual health rather than for the purpose of treatment. However, there is currently no research on the intention to use digital healthcare to promote health promotion behavior among college students.

Considering the reality that social interest in health is high and diverse and complex information is being exposed to Internet users through the Internet, it will be necessary to explore college students' ability to understand Internet health information and their intention to use digital healthcare at a time when health habits are being established, and to confirm the impact on health promotion behavior.

Therefore, this study aims to prepare basic data to improve health management and health promotion behavior of college students by identifying the impact of college students' ability to understand e-health information and intention to use digital healthcare on health promotion behavior.

2. RESEARCH METHOD

2.1. Second-Order Headings

This study is a descriptive research study using a structured questionnaire to identify factors that influence college students' e-health literacy on health promotion behaviors.

2.2. Study Subjects

This study was conducted on college students in G City, Gangwon-do. The subjects of this study were conveniently selected from those who understood the purpose of the study and voluntarily agreed in writing to participate in the study. The number of samples required for multiple regression analysis was calculated using the G*Power 3.1.5 program. When the significance level was .05, the power was .95, and the effect size was medium .15, the calculated sample size was 129 people. In anticipation of dropouts, 160 copies were distributed, and 155 copies were returned, but 152 copies, excluding 3 copies with insufficient responses, were used in the final analysis.

2.3. Research Tools

2.3.1 E-Health Information Literacy

Internet health information literacy refers to the ability to find and understand health information on the Internet and apply knowledge obtained from the Internet to solve health problems [9]. In this study, the eHEALS (eHealth Literacy Scale) tool developed by Norman and Skinner was used [9]. Byeong-gwan Lee et al. translated this tool into Korean and created the e-Health Information Literacy Measurement Tool (KeHEALS) [46]. The tool has a total of 9 questions on a 5-point Likert scale, with higher scores indicating a higher ability to understand internet health information. In the study by Lee Byeong-gwan et al., Cronbach's α value was .88, and in this study, Cronbach's α value was .89.

2.3.2 Intention to Use Digital Healthcare

In order to confirm the subject's intention to use digital healthcare, Shim Yun-bok's [48] smartphone healthcare-related app (APP) usage intention tool, which was modified and supplemented with Venkatesh et al.'s [47] tool, was modified and used for this study. did. The intention to use evaluation tool consisted of a

total of 5 questions and was measured on a 5-point Likert scale. A higher score means higher intention to use. In Shim Yun-bok's [48] study, the reliability Cronbach's α of the intention-to-use tool was .94, and in this study, the Cronbach's α value was .89.

2.3.3 Health Promotion Behavior

Health promotion behavior refers to behavior that actively responds to the environment in order to achieve a higher level of health, and refers to the promotion behavior that an individual seeks to achieve in order to prevent disease, achieve self-actualization, and maintain health [1]. Walker et al. [49] developed HPLP-Ⅱ by modifying and supplementing the existing HPLP (Health Promoting Lifestyle Profile). The tool used in this study was HPLP--Ⅱ, adapted by Seo Hyun-mi [50]. A total of 52 questions were composed of sub-areas of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management. On a 4-point Likert scale, higher scores indicate higher health promotion behaviors. In Seo Hyun-mi's study [50], the reliability Cronbach's α of the intention-to-use tool was .92, and in this study, the Cronbach's α value was .94.

2.4 Data Collection Procedure

Data collection was conducted from April 1 to July 30, 2022 on subjects who gave written consent to participate in the study. A total of 160 questionnaires were distributed and 155 were collected. Of these, 152, excluding 3 with insincere responses, were used in the final analysis.

2.5 Data Analysis Method

The collected data was collected using SPSS 21.0 program. Differences and levels of e-health information comprehension ability, intention to use digital healthcare, and health promotion behavior according to demographic and sociological characteristics were analyzed using descriptive statistics, t-test, and ANOVA. The Scheff'e test was used as a post hoc test. The correlation between e-health information literacy, intention to use digital healthcare, and health promotion behavior was analyzed using Pearson's correlation, and the impact on health promotion behavior was analyzed using multiple regression.

3. RESEARCH RESULTS

3.1. Differences in e-health information literacy, intention to use digital healthcare, and health promotion behavior according to general characteristics

The differences in Internet health information comprehension ability, intention to use digital healthcare, and health promotion behavior according to general characteristics are as follows. Major field (F=2.84, p<.05), proficiency in using health-related apps (F=9.94, p<.001), and experience in using health-related apps (F=3.13, p<.05) are showed a statistically significant difference to e-health information literacy. In intention to use digital healthcare, there was a statistically significant difference in proficiency in using health-related apps (F=7.53, p<.001) and experience in using health-related apps (F=3.65, p<.001). Part-time job (t=2.63, p<.05), satisfaction with major (F=3,54 p<.05), proficiency in using health-related apps (F=4,28 p<.05), experience using health-related apps (F =2.95, p<.05) and one's personality (t=4.08, p<.001) showed a statistically significant differences in health promotion beha

Table 1: Differences in e-health information literacy, intention to use digital healthcare, and health promotion behavior according to general characteristics (N=152)

Characteristics	Categories	n(%)	e-health information literacy		intention to use digital healthcare		health promotion behavior	
			M±SD	t/F(*p*) Scheffe	M±SD	t/F(*p*), Scheffe	M±SD	t/F(*p*), Scheffe
sex	male	42(27.6)	27.42±5.68	-2.95(.768)	18.19±3.65	-6.55(.513)	147.11±23.06	1.35(.177)
	female	110(72.4)	27.74±4.75		18.60±3.47		141.99±19.94	
age(year)	18~20years old	40(26.3)	27.32±4.78	0.56(.560)	18.62±3.17	.0.58(.674)	145.55±19.75	0.46(.763)
	21~23years old	56(36.8)	28.10±5.61		18.69±3.98		144.50±20.91	
	24~26years old	21(13.8)	28.28±4.89		17.90±3.40		138.95±26.70	
	27~29years old	18(11.8)	26.38±4.71		17.66±2.84		140.50±21.52	

	>30years old		17(11.2)	27.64±4.01		19.11±3.55		143.35±15.34	
Sibling ranking	first		72(47.4)	27.91±4.88	0.87(.455)	18.72±3.33	0.74(.529)	143.91±22.45	0.54(.652)
	middle		26(17.1)	26.76±5.24		18.46±4.12		147.15±20.79	
	youngest		51(33.6)	27.56±5.16		18.05±3.52		141.00±19.13	
	etc		3(2.0)	31.33±2.08		20.66±1.15		139.66±13.27	
major field	humanities	a	57(37.5)	26.70±4.73	2.84(.040) b,d,a>c	17.98±3.28	1.29(.277)	140.31±21.28	0.82(.484)
	science and engineering	b	56(36.8)	28.89±5.18		19.17±3.70		146.42±21.31	
	arts and physical education	c	4(2.6)	23.50±7.93		17.25±3.40		141.25±37.07	
	etc	d	35(23)	27.77±4.43		18.37±3.52		143.85±17.51	
grade	1st grade		42(27.6)	26.45±5.24	1.86(.137)	18.66±3.39	0.82(.481)	146.28±24.10	0.38(.761)
	2nd grade		49(32.2)	27.36±5.04		18.75±3.46		142.51±19.89	
	3rd grade		29(19.1)	28.75±4.79		18.75±3.07		141.37±15.97	
	4th grade		32(21.1)	28.75±4.62		17.62±4.10		142.84±22.36	
club activity	yes		93(61.2)	28.15±5.07	1.48(.139)	18.79±3.30	1.33(.184)	144.17±20.61	.564(.573)
	no		59(38.8)	26.91±4.86		18.01±3.79		142.20±21.48	
part time job	yes		81(53.3)	28.08±4.80	1.09(.277)	18.61±3.57	0.46(.644)	147.50±22.20	2.63(.009)
	no		71(46.7)	27.19±5.23		18.35±3.46		138.73±18.38	
Major satisfaction	Mostly dissatisfied	a	11(7.2)	27.45±6.12	0.93(.427)	18.45±2.16	1.29(.280)	140.81±23.42	3.54(.016) d,c,a>b
	usually	b	49(32.2)	26.77±5.10		17.75±3.59		138.32±21.06	
	Generally satisfied	c	64(42.1)	28.35±4.30		18.71±3.52		143.15±20.08	
	very good	d	28(18.4)	27.75±5.87		19.28±3.71		153.89±18.63	
Proficiency in using health-related apps	Not proficient at all	a	7(4.6)	21.85±5.75	9.94(.000) e>d>c,b>a	16.00±3.69	7.53(.000) e>d>b,c,a	127.28±22.09	4.28(.003) e>d>c,b>a
	not proficient	b	32(21.1)	26.09±5.45		17.62±2.92		135.62±20.78	
	usually	c	50(32.9)	26.42±3.47		17.62±3.04		143.60±17.14	
	Generally proficient	d	53(34.9)	29.77±4.34		19.39±3.44		147.13±20.50	
	very proficient	e	10(6.6)	31.90±5.66		22.60±3.74		158.90±26.92	
Experience using health - related apps	yes		116(76.3)	28.36±4.93	3.13(.002)	19.05±3.25	3.65(.000)	146.12±21.40	2.95(.004)
	no		36(23.7)	25.44±4.65		16.69±3.74		134.63±16.62	
personality	positive		126(82.9)	27.71±4.99	0.23(.816)	18.56±3.39	0.54(.590)	146.40±20.23	4.08(.000)
	negative		26(17.1)	27.46±5.17		18.15±4.12		128.88±18.11	

3.2. e-health information literacy, intention to use digital healthcare, degree of health promotion behavior

The subject's ability to understand internet health information was 27.67±5.01 points out of 45 points, intention to use digital healthcare was 18.49±3.51 points out of 25 points, and health promotion behavior was 143.40±20.90 points out of 208 points. In terms of subdomains, health responsibility was 21.60±4.13 out of 36 points, physical activity was 20.73±5.08 out of 32 points, nutrition was 23.61±4.33 out of 36 points, interpersonal relationships were 27.66±3.89 out of 36 points, and spiritual growth was 36 points. The score was 26.08±4.18 out of 32, and stress management was 22.28±3.52 out of 32 points (Table 2).

Table 2: e-health information literacy, intention to use digital healthcare, degree of health promotion behavior (N=152)

Variable	Range	M±SD
e-health information literacy	9~45	27.67±5.01
intention to use digital healthcare	5~25	18.49±3.51
health promotion behavior	52~208	143.40±20.90
health responsibility	9~36	21.60±4.13
physical activity	8~32	20.73±5.08
nutrition	9~36	23.61±4.33
interpersonal relationships	9~36	27.66±3.89
spiritual development	9~36	26.08±4.18
stress management	8~32	22.28±3.52

3.3. Correlation between e-health information literacy, intention to use digital healthcare, and health promotion behavior

The subject's ability to understand Internet health information was found to be significantly positively correlated with the intention to use digital healthcare (r=.523, p<.001), health promotion behavior (r=.384, p<.001), health responsibility (r=.288, p<.001), physical activity (r=.319, p<.001), nutrition (r=.264, p<.001), interpersonal relationships (r=.303, p<.001), spiritual growth (r=.291, p<.001), and stress management (r=.304, p<.001). The intention to use digital healthcare was found to have significant positive correlations with health promotion behavior (r=.372, p<.001), sub-areas of health promotion behavior (r=.277, p<.001), physical activity (r=.371, p<.001), nutrition (r=.231, p<.001), interpersonal relationships (r=.299, p<.001), spiritual growth (r=.307, p<.001), and stress management (r=.217, p<.001). Health promotion behavior was found to have significant positive correlations with sub-areas of health responsibility (r=.754, p<.001), physical activity (r=.835, p<.001), nutrition (r=.814, p<.001), interpersonal relationship (r=.673, p<.001), spiritual growth (r=.836, p<.001), and stress management (r=.840, p<.001).

Table 3. Correlation between e-health information literacy, intention to use digital healthcare, and health promotion behavior (N=152)

Variable	e-health information literacy	intention to use digital healthcare	health promotion behavior	Sub-factors of health promotion behavior					
				a	b	c	d	e	f
e-health information literacy	1								
intention to use digital healthcare	.523**	1							
health promotion behavior	.384**	.372**	1						
a. health responsibility	.288**	.277**	.754**	1					
b. physical activity	.319**	.371**	.835**	.626**	1				
c. nutrition	.264**	.231**	.814**	.634**	.727**	1			
d. interpersonal relationships	.303**	.299**	.673**	.346**	.344**	.399**	1		
e. spiritual development	.291**	.307**	.836**	.604**	.580**	.561**	.675**	1	
f. stress management	.304**	.217**	.840**	.574**	.616**	.664**	.570**	.652**	1

*p <.05, **p <.001

3.4. Factors Affecting Health Promotion Behavior

Prior to conducting regression analysis, the tolerance and variance inflation factor (VIF) values were examined to determine whether multicollinearity occurred between each variable. The tolerance limit values range from 0.65 to 0.94, which are all greater than 0.1, and the variance inflation values range from 1.063 to 1.526, which do not exceed 10, so there appears to be no problem with multicollinearity. Multiple regression analysis was conducted using Internet health information comprehension ability, intention to use digital healthcare, intention to use health-related apps, experience using health-related apps, and personal characteristics. As a result, the factors influencing health promotion behavior were statistically significant in the order of intention to use digital healthcare (β=1.172, p<.05) and ability to understand internet health information (β=.912, p<.05). In particular, one's personality (β=-16.297, p<.001) was analyzed to have a conflicting effect on health promotion behavior, and the explanatory power of the health promotion behavior used in the analysis was 26.7% (Table 4).

Table 4: Factors affecting health promotion behavior

variable	B	SE	β	t	*p*
a constant	107.486	12.432		8.646	.000
e-health information literacy	.912	.352	.219	2.540	.012
intention to use digital healthcare	1.172	.500	.197	2.347	.020
proficiency in using health-related apps	2.645	1.737	.125	1.523	.130
experience using health-related apps	-.252	3.860	-.005	-.065	.948
personality	-16.297	3.977	-.295	-4.098	.000
	Adj R^2= .267	R^2= .291	F=11.983	*P* <.001	

4. DISCUSSION

This study aims to identify college students' ability to understand e-health information, intention to use digital healthcare, and health promotion behavior, and to determine their relationship and influence on health promotion behavior. Through this, the purpose is to prepare basic data to improve the health promotion behavior of college students. As a result of this study, college students' ability to understand internet health information was above average, with 27.67 ± 5.01 points out of 45 points. Although a different tool was used from this study, there was a study [16] that reported that domestic college students' e-health literacy was above the medium level (3.51 ± 0.5) out of 5. In addition, a study [37] that reported that college students' digital health literacy related to COVID-19 was high at 2.98 (±0.4) out of 4 was similar to the results of this study. These results can be interpreted as the fact that anyone can easily access and utilize health-related information through the Internet thanks to the development of the 4th industrial technology and the spread of smartphones.

Looking at the ability to understand Internet health information according to the general characteristics of college students, the difference between majors was significantly higher in understanding Internet health information among college students in science and engineering and humanities than in arts and sports. These results are consistent with studies [51] that reported that college students majoring in health and medical sciences had a higher ability to understand Internet health information than college students in non-majors. Additionally, the higher the proficiency in using health-related apps, the higher the ability to understand internet health information. This is a similar result to a study [52] that found that the group with high ability to understand Internet health information spent longer on the Internet and used the Internet more frequently. As the time and frequency of using the Internet increases, people become more familiar with how to use the Internet and become more proficient at finding health information on the Internet, which is consistent with research [53] that found that this experience had a positive impact. In the end, it is judged that college students' major-related knowledge and skilled experience with smartphone apps influenced their ability to understand Internet health information.

Looking at college students' intention to use digital healthcare, the score was 18.49±3.51 out of 25, which was above the average level. In particular, the more experience users had in using health-related apps and the higher their proficiency in using health-related apps, the higher their intention to use them. This suggests that continuous promotion and development of educational programs and training on the pros and cons of using health-related apps and how to use them are necessary to expand college students' knowledge and experience in using health-related apps.

Lastly, college students' health promotion behavior was high, above average, with 143.40±20.90 points out of 208 points. Looking at the subdomains of the health promotion behavior scores, they appeared in the following order: interpersonal relationships, spiritual growth, stress management, nutrition, physical activity, and health responsibility. This is the same result as a previous study [37] that found that e-health literacy has a significant positive correlation with health promotion behavior. In addition, the results are similar to the research results [54], in which female college students' level of health promotion behavior was higher in the areas of interpersonal relationships and self-actualization than in the areas of physical activity. These results suggest that college students are more interested in interpersonal relationships and mental health aspects rather than awareness (responsibility) for their own health, physical activity and nutrition for health.

The results of the regression analysis showed that the higher the intention of college students to use digital healthcare and the higher their ability to understand internet health information, the higher the level of health promotion behavior. These results are in line with the results of the study that the group with a high level of understanding Internet health information had higher interest in health and pursuit of health information than the group with a low level of understanding Internet health information [54-57]. Therefore, strategies to promote health promotion behavior among college students require measures to increase the level of Internet health information literacy and intention to use digital healthcare. In other words, it is necessary to develop a program to improve college students' ability to understand Internet health information, and support is needed to increase the intention to use digital healthcare based on the ability to judge the value of Internet health information. Universities should provide opportunities for college students to systematically learn about critical acceptance of Internet information and strategies for selecting quality information, and continuously support content that allows them to experience various health-related apps and share their usage experiences.

5. CONCLUSIONS

This study aimed to determine college students' ability to understand internet health information, intention to use digital healthcare, and health promotion behavior, and to determine the impact on health promotion behavior. Through this, this is a descriptive research study to prepare basic data for developing educational measures and educational programs to promote health promotion behavior among college students.

As a result of the study, there was a significant correlation between college students' ability to understand internet health information, intention to use digital healthcare, and health promotion behavior. Additionally, college students' health promotion behavior was found to be influenced by their ability to understand internet health information and their intention to use digital healthcare. Therefore, in order to improve health promotion behavior among college students, it is necessary to increase their ability to understand e-health information and their intention to use digital healthcare. Therefore, it is necessary to develop and apply systematic educational strategies and educational programs for this purpose.

Based on the results of this study, we would like to make the following suggestions.

First, because this study targeted college students in G City, Gangwon-do, there may be errors in generalizing it to all college students. Therefore, there is a need to accumulate follow-up studies targeting college students in various regions.

Second, this study used a self-report method to measure Internet health information literacy and intention to use digital healthcare. Therefore, there may be differences in college students' actual knowledge level and experience related to their acquisition and use of Internet health information and their intention to use digital healthcare.

Third, we propose follow-up research to develop an educational program that can actually improve the health promotion behavior of college students and verify its effectiveness.

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