Culinary Science and Hospitality Research (October 2015)
Vol. 21, No. 5, pp. 25-37

Perception of Privacy and Sensitivity of Personal Information among University Students

Yoo-Kyung Boo[1], Jin-Won Noh[1], Yun-Mi Kim[2], Sung-Soo Kim[3] and Young-Ah Rha[4¶]
[1]Dept. of Healthcare Management, Eulji University
[2]Dept. of Nursing, Eulji University
[3]Dept. of Healthcare Management, Cheong ju University
[4¶]Dept. of Food Technology & Service, Eulji University

ABSTRACT: By studying the awareness level of students, for the need to protect personal information, and also by studying students' level of perception as to which information needs protection, this study aims to show that increased education is beneficial, and necessary, across all university majors. This increased education is necessary to improve information security, and increase the responsible sharing of private data which has many benefits, specifically in the Healthcare field. Utilizing student volunteers across multiple majors at a university in South Korea. These questionnaires measured the students' awareness of private information, their perception of private information and also the students' experience in receiving university level education regarding private information and the need for its protection. This study shows that, when compared to students in other fields, students in the field of public health had a higher level of awareness regarding the consequences of personal information disclosure for both public purposes and medical research. Within the parameters of this study, this outcome can be explained as the result of exposure to educational curriculum which contained information related to personal information protection. This increased education raised the student's awareness of which information is considered private, as well as, which information is valuable when responsibly shared. As a result, this study shows that an increase in education regarding information privacy, should be included in all university majors, and gives us evidence to support that this additional education is valuable to students at all levels and should be encouraged.

Keywords: privacy, protected health information, disclosure of personal information, privacy act

INTRODUCTION

Coinciding with rapid advancements in information technology and the digitization of data, an enormous amount of information is being collected and controlled in an ever connected, computerized, system. Vast amounts of this collected, personal, information bring substantial economic value, which increases the misuse of private data, resulting in invasions of privacy (Hann, Hui, Lee & Ping 2002). Public institutions have been collecting, generating, recording, storing, holding, processing, and editing personal health data in this computerized system. As a result, while these systems enhance accessibility and availability of data, there is increasing demand for improvements in the legal accountability of pub-

¶ Corresponding Author: Young-Ah Rha, Dept. of Food Technology & Service, Eulji University, SeongNam Daero 553, Seong Nam 461-713, Korea, Tel. +82-31-740-7181, Fax. +82-31-740-7181, E-mail: yana@eulji.ac.kr

lic institutions, regarding the use of personal data. According to the Privacy Protection Act, personal information is defined as personally identifiable information including one's name, resident registration number, and pictures that can be directly or indirectly inferred to identify an individual (Personal Information Protection Act 2011).

In South Korea, from 2010 to 2011, there was a 220% increase in invasions-of-privacy from 54,882 to 122,215 (Jeon & Jeong 2012). Cases involving invasion of privacy are increasing. These acts are committed using spam messages, voice phishing and financial fraud via online impersonation. Currently 90% of the student population, which is comprised of children from upper-elementary school to college students, are the primary users of computers and internet in South Korea. Their early access to computers and internet could increase the risk of information leakage, leading to invasions of privacy (Jeon & Jeong 2012). This is not a desirable phenomenon in any society. Consequently, in order to protect personal information and ensure human dignity from the inappropriate use of personal data, the Personal Information Protection Act was adopted on March 30th 2012.

According to article 17 of the Korean constitution (The Constitution of the Republic of Korea), all citizens shall enjoy the inviolable right to privacy of life. The definition of privacy originally referred to an individual's right to a private life or "right to be let alone," with no interference or disturbance. It has evolved to include an individuals' right to have control over, and choices concerning, the collection and handling of personal information in regards to the data subject's autonomy (Lee 2009). Furthermore, public perception of personal data protection has been improving as data informatization systems have developed. Information privacy is defined as a right to details concerning the process of collection, use, or disclosure of data by actively engaging in the process (Mayer-Schonberger 1998) (Lee & Lee 2009).

Disclosure of personal information is inevitable when improving the quality of data. The Ministry of Security and Public Administration (MOSPA) has created a support group of volunteer college students to help protect private information and to increase awareness of the need to protect private data. The expected outcome of the group's formation is an increase in compliance with privacy guidelines in the community and universities (Ministry of Security and Public and Administration 2012) (Jung 2001). In the same manner, it is necessary to recognize the different perception levels of private data protection among individuals and establish an effective strategy to ba- lance between the disclosure of personal data for research purposes and protections for personal data.

The sensitivity level of information is considered an important attribute in determining whether or not to provide private information (Lee 2012). Sensitivity of information is defined as an individual's discomfort level when providing personal data to investigators (Angst & Agarwal 2009). Moreover, individuals are more sensitive when providing financial information and personal health information than information about lifestyle or purchase habits (Phelps 2000).

Based on the empirical studies reviewed, several categories of variables which impact a consumer's attitude toward information privacy invasion were identified. Provided that students comprise a subset of consumers, as well as, the future of modern consumerism, the following information is valid and worthy of consideration for this study. The variables affecting consumer attitudes are as follows: first, individual differences and personality characteristics have an impact on privacy perception (Haas, Wohlgemuth, Echizen, Sonehara & Müller 2011) (Mohamed & Ahmad 2012), second, a general concern for information privacy may impact a consumer's perception of privacy invasion in a specific context (Li 2012). Other research within health information has also confirmed that consumer attributes, such as privacy concerns and personalization values, impact attitude toward services (O'Brien & Yasnoff 1998) (Bansal, Zahedi & Gefen 2010).

This study aims to measure student's awareness for the need to protect personal information, as well as, the student's perception of which information needs protection. By measuring the student's awareness and perception, we aim to show that increased education, in regards to the protection of private data, will improve information security. The additional education will also increase the likelihood of sharing

of private data, such as personal health information, for use in beneficial areas such as Healthcare.

According to previous studies identified the recognition of health administration students on personal information protection, it showed that just 17.2% percent were cognizant of the personal information protection act enacted in 2011. This result, in the case of university students of health administration while in school, not carried out continuing education about personal information protection act and it is thought to have mastered the knowledge of the personal information protection act through a medical institute after work (Kim 2014).

Also another research has surveyed level of textual recognition and of practice by nursing students who experienced clinical practice. In this study, the higher the awareness of the privacy is also high practice between the research subjects. There are difference according to grade in school and age of the subject, and experience with clinical practice, existence of regular educational program, and the length of each educational session. For both total score and score for every domain, there was a correlation between recognition and practice(Kim 2013).

To raise awareness of the personal information protection act in health care field students, their awareness of privacy clearly investigate and a course that can deal with this act should separately be offered so that they could have the right understanding of personal information protection and practice it properly.

METHOD AND MATERIALS

In order to assess personal information protection perception levels among university and college students, as well as those level's related attributes, we conducted a survey of students in one South Korean university, located in a metropolitan area of Seoul. The study included participants from food science and technology departments, as well as nursing and healthcare management departments. The survey was conducted among first to fourth year students. The study population was divided into three groups: nursing students who will become a direct care provider, medical healthcare management students who will become a hospital or medical record administrator, and students from the food science and technology department, who will become non-medical personnel. These three groups were selected to test the hypothesis that students in different fields of study will show varied levels of perception, and awareness, concerning personal health information. With the cooperation of professors and teaching assistants in the three departments, 500 survey questionnaires were distributed from November 5 to December 7 in 2011.

A self-administered questionnaire was used to collect the data. A confidentiality agreement was signed prior to the administration of the survey. The intention of the study and the details of the questionnaires were clearly explained. The Canadian Electronic Health Information and Privacy Survey (EKOS research associates, 2007), (Lee & Cho 2007) conducted in Canada, and the Whiddett study survey (Hunter & Whiddet 2009), (Sheehan & Hoy 2000), were reviewed and tailored to create survey questionnaires for this study. Further, the survey tool in Kim's study (Kim 2010) (Culnan & Bies 2003) based on 18 identifiers of protected health information, defined by US Health Insurance Portability and Accountability Act (HIPAA), was utilized. The survey questionnaires were divided into four broad categories: perception of personal information protection, sensitivity level of personal information, willingness to provide health information based on different purposes of disclosure, and finally, awareness level of the need for personal data protection, according to the respondents' prior attendance in classes, in which, the curriculum addressed the protection of personal data. Sensitivity was defined as an individual's discomfort level in sharing their personal information and an unwillingness to disclose personal data due to expected disadvantages. The survey consisted of five sections, with 18 items, as shown in Table 1.

Statistical Methodology

The survey data were analyzed using SPSS Version 18.0. Regression analysis was used for individual characteristics. Respondent's demographic profiles and health information sensitivity were assessed via descriptive analysis. We conducted an ANOVA to compare gender differences in perception of personal health information and sensitivity level based on dif-

Table 1. Survey questionnaires

Category	Items
Perception of health information protection	Purpose of disclosure in healthcare institutions
	Importance of personal information protection
	Privacy protection level in healthcare institutions
	Risk of personal-information leakage
	Disclosure of personal data to third parties without consent after receiving medical care
Perception of sensitivity of personal health information	Sensitive personal information(7) : resident registration number, address, home phone number, cellular phone number, photo, work address and company name
	General information(6) : name, full date of birth, gender, marital status, email address, patient ID
	Health information(5) : past medical history, test results, medication information, diagnosis of specific diseases(sexual disease, psychical disorder), general diagnosis(flu or hypertension)
Respondent's willingness to provide personal health information according to different purposes of disclosure	Request for public purpose from governmental institutions
	For medical research or eduction purposes from governmental institutions or researchers
	Request for marketing purpose from an insurance company or pharmaceutical company
Prior attendance in a course related to personal information protection	Awareness of personal information protection act
	Attendance at personal data protection education
Demographic characteristics	Major, Year of college, Gender & age

ferent types of information. Using an ANOVA, prior experience in receiving medical care and disclosure to third parties afterwards was assessed. Perception level of personal health information and respondent's sensitivity to providing private data, according to their prior experience receiving education related to personal information protection, were analyzed with repeated measures of ANOVA. A chi-square test was done to measure the differences between a respondent's willingness to disclose personal data with different types of information, and also the purpose of disclosure. A Pearson correlation was used to analyze the relationship between the perception of personal health information and the sensitivity of the four variables.

RESULTS

Respondents Demographics

The predominance of female respondents versus male respondents in the total number of 470 survey participants (22.55% vs. 77.45%) can be interpreted as, nursing and healthcare management schools are dominated by female students. The majority of participants were adults 20 years of age and over (77.87%). There was an almost even distribution of respondents from first-year to fourth-year students. Second year students had the highest percentage at 29.15%. The survey participants consisted of nursing (37.02%), healthcare management (36.17%) and food science and technology students. (26.81%). A total of 93.19% of participants answered in the affirmative when asked if they had any experience in receiving medical care. A total of 69.57% of participants had attended at least one course related to personal data

Table 2. Respondents demographic characteristics

Response categories		N	%
Gender	Male	106	22.55
	Female	364	77.45
Age group	Less than 19 years	104	22.13
	20 years and over	366	77.87
Year of college	First-year	113	24.04
	Second-year	137	29.15
	Third-year	109	23.19
	Fourth-year	111	23.62
Major	Nursing	174	37.02
	Healthcare management	170	36.17
	Food science and technology	126	26.81
Prior experience in receiving medical care	No	32	6.81
	Yes	438	93.19
Prior attendance in a course related to personal information protection	Education in college	55	11.70
	Education in out-of-college	88	18.72
	No education received	327	69.57
Disclosure to a third party	Yes	406	86.38
	No	64	13.62
Total		470	100.00

protection, while the remainder had received no such education. Finally, respondents whose personal information was disclosed to a third party after receiving medical service comprised 13.62% of the sample (Table 2).

Perception of Personal Health Information Sensitivity

The personal health information of the participants was divided into 3 categories: sensitive personal information, general information, and health information. The sensitivity levels of each category were statistically analyzed. The highest sensitivity level was in the category of sensitive personal information, followed by health information, and finally general information (Table 3). In the category of sensitive information, respondents replied that their resident registration number was the most sensitive, followed by home address, and finally their cellular phone number. In the category of health information, the diagnosis for specific diseases had the highest level of sensitivity, followed by test results, past medical history, medication information, and finally general diagnosis. Patient ID had the highest sensitivity level in the general information category, followed by email address, name, full date of birth, marital status, and then gender.

Perception of Personal Health Information Protection

There was no significant gender or age difference in the perception of personal health information. Statistically higher sensitivity levels, within the different types of health information (general, health, sen-

Table 3. Respondent's sensitivity level with different types of information

Types of information	Information items	N	Mean	SD
Sensitive personal information	Resident registration information	470	4.81	0.46
	Home address	470	4.55	0.68
	Home phone number	470	4.50	0.72
	Cellular phone number	470	4.51	0.76
	Picture	470	4.47	0.79
	Wok address/name of company	470	4.12	0.90
	Subtotal		4.49	0.54
General information	Name	470	3.36	1.13
	Date of birth	470	3.35	1.10
	Gender	470	2.90	1.17
	Marital status	470	3.10	1.10
	Email address	470	3.69	1.03
	Patient registration number	470	3.92	1.03
	Subtotal		3.38	0.78
Health information	Test results	470	4.33	0.84
	Past medical history	470	4.33	0.86
	Medication information	470	4.07	0.93
	Diagnosis of specific disease	470	4.46	0.84
	General diagnosis	470	3.61	1.07
	Subtotal		4.16	0.75
	Total		3.94	0.68

sitive), were observed in females when compared to male subjects. Between age groups, there was a statistically significant difference in the perception of personal health information and sensitivity level, particularly with information about health and sensitive data, but not with general information. Fourth-year Students showed the highest awareness level of personal health information. Using Tukey B, a statistically significant difference was found between first and fourth-year students, as well as between second and fourth-year students. Fourth-year students had the highest perception of personal health information and there was a significant difference when compared to first-year students. Moreover, fourth-year students had the highest perception of sensitive personal information, and a significant difference was observed between first and third-year students. Students that had received education on information protection had a 4.07 awareness level of personal health information, compared to 3.97 among students who had not received the education. According to past education, there was no significant difference in sensitivity within the three types of information. However, regardless of a respondent's attendance in courses related to personal data protection, the perception of personally sensitive information was notably high; 4.5 on average. According to experience in providing health information to third parties, a higher, although statistically insignificant, perception of personal heath data and sensi-

Table 4. Perception of individual health information and information sensitivity

Category	Variable	Perception level Mean (SD)	Sensitivity level		
			General information Mean (SD)	Sensitive personal information Mean (SD)	Personal health information Mean (SD)
Gender	Male	3.94 (0.48)	3.37 (0.83)	4.38 (0.63)	4.09 (0.85)
	Female	3.95 (0.48)	3.39 (0.76)	4.52 (0.51)	4.18 (0.72)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	t	−0.19	−0.16	−2.12	−1.09
	p	0.85	0.87	**0.04***	0.27
Age group	Less than 19 yss	Le88 (0.40)	3.31 (0.63)	4.36 (0.56)	4.02 (0.72)
	20 yrs and over	3.96 (0.50)	3.41 (0.81)	4.53 (0.53)	4.20 (0.75)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	t	−1.69	−1.32	−2.80	−2.19
	p	0.09	0.19	**0.01****	**0.03***
Major	Nursing	3.92 (0.51)	3.35 (0.74)	4.48 (0.53)	4.21 (0.75)
	Healthcare Mng	4.01 (0.44)	3.36 (0.78)	4.47 (0.55)	4.11 (0.71)
	Food S&T	3.89 (0.47)	3.46 (0.82)	4.53 (0.55)	4.17 (0.80)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	F	2.76	0.88	0.46	0.83
	p	0.06	0.42	0.63	0.44
*Year of college	1st year	3.87a (0.43)	3.30 (0.68)	4.34a(0.57)	4.03a(0.75)
	2nd year	3.91a (0.46)	3.34 (0.83)	4.46 (0.55)	4.09 (0.79)
	3rd year	3.94 (0.53)	3.36 (0.73)	4.57b(0.47)	4.25 (0.70)
	4th year	4.07b (0.48)	3.54 (0.83)	4.61b(0.54)	4.30b(0.72)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	F	3.81	2.08	5.77	3.36
	p	**0.01****	0.10	**0.00****	**0.02***
Prior experience of receiving medical treatment	Yes	3.98 (0.45)	3.51 (0.81)	4.46 (0.60)	4.26 (0.73)
	No	3.94 (0.48)	3.38 (0.77)	4.49 (0.54)	4.16 (0.75)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	t	0.42	0.91	−0.31	0.78
	P	0.67	0.36	0.75	0.44
Disclosure to a third party	Yes	3.98 (0.45)	3.51 (0.81)	4.46 (0.60)	4.26 (0.73)
	No	3.94 (0.48)	3.38 (0.77)	4.49 (0.54)	4.16 (0.75)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	t	0.42	0.91	−0.31	0.78
	P	0.67	0.36	0.75	0.44
Prior attendance in a course related to personal information protection	Education in college	4.07b (0.44)	3.35 (0.81)	4.49 (0.56)	4.17 (0.67)
	Education out of college	4.01 (0.51)	3.35 (0.75)	4.48 (0.52)	4.11 (0.75)
	No education received	3.91a (0.47)	3.40 (0.78)	4.49 (0.55)	4.18 (0.76)
	Total	3.94 (0.48)	3.38 (0.78)	4.49 (0.54)	4.16 (0.75)
	F	3.75	0.16	0.01	0.30
	p	**0.02***	0.85	0.99	0.74

* Tukey B : b>a, ** Dunnett T3 : b>a.

tivity differences were observed amongst respondents who were educated concerning personal data protection (Table 4).

Correlation Analysis for Perception of Personal Health Information and Sensitivity of Information

A respondent's willingness to disclose personal information, according to the purpose of the disclosure, was divided into three categories: disclosure without agreement, disclosure after agreement, and denial to provide. A Chi-square test was used to assess the participant's responses according to the purpose for disclosure. The proportion of female respondents that consented to disclosing personal information, for medical research or education purposes, was higher than male respondents. The percentage of male students who refused to provide their health information for public purposes showed statistical significance when compared to female students. According to department, the proportion of students refusing to disclose personal data was highest among students in the food science and technology department; illustrating a statistical significance. The acceptability of sharing information, for the purposes of medical research or education, was not influenced by age, year of college, experience receiving medical care, prior education received, or disclosure to a third party. There was no statistically significant difference, categorically, in an individual's willingness to provide personal data for profit-making purposes. However, it is worth note that the percentage of respondents, who were reluctant to share personal information for profit, was shown to be 37%, whereas 53%of respondents were willing to provide data for public purposes (Table 5).

DISCUSSION AND CONCLUSION

In order to protect one's personal information from unauthorized collection, data leakage, and data misuse, and to promote citizen's rights and benefits, and to further ensure an individual's dignity and value, the Personal Information Protection Act was enacted in South Korea on September 29th 2011. It came into effect on March 30th 2012. According to article 2 3 of the Personal Information Protection Act, sensitive information is defined as : ideological beliefs, membership in, or withdrawal from, trade unions or political parties, political opinions, information related to sex life or health, and information that can critically damage one's personal privacy if breaches of such information occurred. Compared to general information, sensitive personal data is more strictly regulated by the law because un authorized disclosure of such sensitive information could cause serious ramifications that could threaten personal privacy. The collection of personal information, such as resident registration numbers, is widely practiced in both public and private sectors increasing the risk of leakage. For this reason, personally identifiable information is treated in the same manner as sensitive information, which limits the disclosure of information that people have not given consent to share.

Furthermore, personal health information is defined as all data involved in the process of medical treatment such as diagnosis and care plans, records of care, and test results. In general, health information, as a prime example of personal information, refers to data regarding an individual's family members, genetic characteristics, medical history, drug addiction and sexually transmitted diseases. This information is an extension of the definition of position, property, social relations, sex life, and habits which are included in the definition of highly sensitive information (Dinev & Hart 2003). While patient medical records are defined as sensitive information, it is believed that appropriate use of this data should be considered for medical research and also in the public health field (Smith, Dinev & Xu 2011). Additionally, this study is of importance to the analysis of results, giving consideration to the cultural background of Korean adults, in order to identify South Korean citizen's perception of personal health information and sensitivity levels regarding different types of information. There were differences in regards to the respondent's sensitivity to different types of information, showing the highest levels of sensitivity for sensitive information, followed by health information and then general information. This indicates that individuals were most sensitive when providing sensitive personal information, such as their resident registration number. These results show that diagnosis for specific diseases, or past medi-

Table 5. Respondent's willingness to provide health information with different purposes of disclosure

Purpose	Demographic characteristics		Disclosure without consent		Disclosure with consent		Refusal to provide		χ^2	*p*-value
			N	%	N	%	N	%		
Public purpose	Gender	Male	7	6.67	84	80	14	13.33	10.47	**0.01****
		Female	26	7.28	315	88.24	16	4.48		
	Age group	< 19 years	5	4.85	92	89.32	6	5.83	1.2	0.55
		> 20 years	28	7.8	307	85.52	24	6.69		
	Year of college	1st year	6	5.41	97	87.39	8	7.21	2.85	0.83
		2nd year	10	7.46	113	84.33	11	8.21		
		3rd year	8	7.41	96	88.89	4	3.7		
		4th year	9	8.26	93	85.32	7	6.42		
	Department	Nursing	10	5.92	151	89.35	8	4.73	13.29	**0.01****
		Healthcare	19	11.18	143	84.12	8	4.71		
		Food science	4	3.25	105	85.37	14	11.38		
	Prior experience of receiving medical treatment	No	2	6.9	23	79.31	4	13.79	2.72	0.26
		Yes	31	7.16	376	86.84	26	6		
	Prior attendance in a course related to personal information protection†	Education in college	7	12.73	46	83.64	2	3.64	5.78	0.22
		Education out of college	5	5.75	73	83.91	9	10.34		
		No education received	21	6.56	280	87.5	19	5.94		
	Disclosure to a 3rd party†	No	31	7.75	347	86.75	22	5.5	6.12	**0.05***
		Yes	2	3.23	52	83.87	8	12.9		
Medical research or education purpose	Gender	Male	4	3.81	84	80	17	16.19	12.71	**0.00****
		Female	10	2.82	325	91.55	20	5.63		
	Age group	< 19 years	3	3.03	89	89.9	7	7.07	0.16	0.92
		> 20 years	11	3.05	320	88.64	30	8.31		
	Year of college	1st year	3	2.78	96	88.89	9	8.33	5.91	0.43
		2nd year	2	1.49	118	88.06	14	10.45		
		3rd year	3	2.75	97	88.99	9	8.26		
		4th year	6	5.5	98	89.91	5	4.59		
	Department	Nursing	3	1.78	156	92.31	10	5.92	12.91	**0.01****
		Healthcare	8	4.71	153	90	9	5.29		
		Food science	3	2.48	100	82.64	18	14.88		
	Prior experience of receiving medical treatment	No	0	0	26	89.66	3	10.34	1.15	0.56
		Yes	14	3.25	383	88.86	34	7.89		
	Prior attendance in a course related to personal information protection†	Education in college	0	0	52	94.55	3	5.45	4.7	0.32
		Education out of college	1	1.15	78	89.66	8	9.2		
		No education received	13	4.09	279	87.74	26	8.18		
	Disclosure to a 3rd party†	No	13	3.27	354	89.17	30	7.56	1.38	0.5
		Yes	1	1.59	55	87.3	7	11.11		
Profit-related purpose	Gender	Male	1	0.99	58	57.43	42	41.58	0.11	0.95
		Female	3	0.87	193	55.78	150	43.35		
	Age group	< 19 years	0	0	59	60.2	39	39.8	1.78	0.41
		> 20 years	4	1.15	192	55.01	153	43.84		
	Year of college	1st year	0	0	66	61.68	41	38.32	11.88	0.07
		2nd year	3	2.36	76	59.84	48	37.8		
		3rd year	0	0	60	56.6	46	43.4		
		4th year	1	0.93	49	45.79	57	53.27		
	Department	Nursing	1	0.6	100	60.24	65	39.16	6.2	0.19
		Healthcare	1	0.62	95	58.64	66	40.74		
		Food science	2	1.68	56	47.06	61	51.26		
	Prior experience of receiving medical treatment	No	0	0	17	60.71	11	39.29	0.47	0.79
		Yes	4	0.95	234	55.85	181	43.2		
	Prior attendance in a course related to personal information protection†	Education in college	1	1.96	31	60.78	19	37.25	3.94	0.41
		Education out of college	0	0	41	49.4	42	50.6		
		No education received	3	0.96	179	57.19	131	41.85		
	Disclosure to a 3rd party†	No	2	0.52	216	55.96	168	43.52	4.72	0.09
		Yes	2	3.28	35	57.38	24	39.34		

'Unknown' answer is considered as missing value, †: Expected frequencies of less than5 are more than 20%.

cal history, had higher sensitivity levels. This indicates that invasion of privacy was the respondent's greatest concern. There were significant gender differences in the perception of sensitive information. Moreover, significant differences in sensitivity levels for different types of information, excluding general information, between age groups and years of college were found. This demonstrates that respondents in their senior year of college have higher awareness and sensitivity levels in regards to personal information protection and the potential leakage of secure personal data. This study shows that students, who received an education, concerning personal information protection, have significantly higher perception levels of personal information. This finding supports the need for curriculum that can educate students on the topic of personal data protection. Nevertheless, all respondents, regardless of their information protection education, were aware of the risks associated with disclosing sensitive personal information.

Recent research has shown that increases in individual concerns over privacy have influenced information sensitivity, which has negatively affected people's decisions to disclose personal information. A respondent's willingness to provide personal information varied with the different intentions of disclosure. This study showed statistical significance in the number of female respondents who agreed to disclose personal information for medical research or education purposes when compared to male respondents. As previously illustrated, female students are more sensitive in regards to the three types of information presented (personal, health, sensitive) than their male counterparts. Thus, the incidence of higher disclosure rates for females can be attributed to them having higher levels of perception, in regards to the protection of personal information, and also an increased awareness of the necessity of personal data for medical research and/or education purposes. This result may be influenced by the predomination of female students in the total population. Furthermore, there were a significant number of students from both the healthcare management and food science and technology departments, that agreed to provide personal information for medical research, education, or public purposes. This finding can be explained as a result of their experience in the field of public health, epidemiology classes or by their involvement in disease research; any instance of which would likely increase their perception of the importance of providing data for the benefit of the public. According to the privacy calculus model, a higher level of benefits, gained by providing personal information, is related to a higher willingness to disclose personal information. As such, students in public health fields are clearly aware of the benefits of personal information in public health research, unlike other students who are not in the public health field. Therefore, those public health students that were willing to provide personal information, likely understand the future benefits of such information, leading to an increase in respondent's willingness to provide private data. Our research indicates that these beneficial decisions can likely increase along with increased education regarding information security and the associated benefits of sharing information with trusted sources.

A majority of schools in South Korea do not require, or may not provide, courses to educate students about the protection of personal information. After examining the curriculum of the three departments in our study, it was found that only the health service management department established an independent course concerning privacy protection and information. Our study shows that students in this department had a high awareness level which can be attributed to the education they received, indicating that other majors could benefit from further education. Interestingly, nursing students had the highest perception level despite a lack of education concerning privacy protection. Direct contact with patients during clinical work may explain their increased awareness level, indicating that experience can take the place of education in this situation. Along with the advancement of computer technology, and informatization, the types of privacy invasions that occur are becoming increasingly varied and complex. Therefore, it is desirable to include courses in university curriculums which will educate students about information protection. In fact, as 90% of the student population, which is comprised of children from upper-elementary school to college students, are the primary users of computers and in-

ternet in South Korea, further study will likely demonstrate that providing this education is beneficial early in student's careers. Further, strictly regulated laws protecting sensitive information will ultimately increase compliance with privacy standards at a national level.

Personal data, including health information, is sensitive information for all people. The protection of this information should be varyingly reinforced according to the degree of sensitivity. However, appropriate uses for this data should be taken into consideration, with caution, for the advancement of medicine and public health. The disclosure of personal information and personal data protection are, seemingly, in direct opposition to one another. Regardless, it is our recommendation that appropriate use of this data, under protection from the law and proper ethics, should be considered for medical research and public purposes which are working towards the betterment of people. Therefore, increased education regarding the value of this information will increase the amount of available data, which will be provided by an educated population that understands the value of providing such information to trusted sources. Plans to raise a privacy awareness through a college education adds privacy to existing courses rather than operating as an independent subject, it would be effective to deal with practices for private data protection. Since low awareness of the privacy of younger age, especially for freshman it would be more effective to open liberal arts or a subject dealing with the personal information protection. The emphasis on protecting personal data cannot be overemphasized. Thus, through a variety of educational program should strive to have the correct privacy awareness.

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Received: 19 August, 2015
Revised: 15 September, 2015
Accepted: 15 October, 2015

대학생들의 개인정보보호의 인식과 개인정보의 민감도에 대한 연구

부유경[1] · 노진원[1] · 김유미[2] · 김성수[3] · 나영아[4]¶

[1]을지대학교 의료경영학과·[2]간호학과, [3]청주대학교 의료경영학과,[4]¶을지대학교 식품산업외식학과

국문초록

본 연구는 정보를 빠르게 수용하고 활용하는 대학생들이 정보보호의 중요성과 건강정보에 관한 인식을 알아보고 대학교에서 개인정보보호 교육의 필요성을 확인하고자 경기도 소재 대학교 3개 학과 학생 전수를 대상으로 설문조사를 수행하였다. 조사결과 개인정보의 민감도는 민감정보, 건강정보, 일반개인정보 순으로 높았다. 민감정보는 주민번호, 주소 및 휴대전화번호에서, 건강정보는 진단명, 검사결과, 과거병력, 투약정보에서 민감하게 반응하였다. 여학생이 남학생보다, 성년이 미성년보다, 고학년일수록, 개인정보보호교육 경험자가 교육받은 적이 없는 응답자에 비하여 개인건강정보에 대한 인식수준이 높고 민감도 차이를 나타났다. 또한, 개인정보의 제공의사는 공공 및 의학연구보다 영리목적일 경우 제공불가라고 응답한 비율이 높았다. 특히 학생들은 주민번호, 성병과 같은 진단명의 공개나 과거병력이 민감하게 반응하여 개인의 프라이버시 침해를 우려하였다. 보건 전공계열 학생이 기타 계열의 학생보다 의학연구나 교육 공공목적에 정보제공의사가 높아 교과 학습을 통해 공공목적이나 의학연구에 있어서 정보제공의 중요성에 관한 인식이 높음을 알 수 있었다. 건강정보는 개인에게 있어서 매우 민감한 정보이지만 의학 발전이나 공중보건의 측면에서 적절한 정보의 활용 또한 고려되어야 한다. 다양한 개인정보 유출 피해가 증가하고 있으므로, 정보주체로서 개인정보보호 의식 함양을 위해 대학 교양교육과정 또는 정보관련 교과목에 개인정보보호 교육을 포함시킴으로써 개인정보보호에 대한 인식수준을 높이는 것이 필요하다.

주제어: 개인정보보호, 보호대상 건강정보, 개인정보 인식도, 개인정보 제공의사, 개인정보보호법