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ARAŞTIRMA MAKALESİ **RESEARCH ARTICLE**

The Online Information Seeking and Interpretation Strategies in Nursing Students

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Abstract

Objective: Problem solving skills, the integration model is increasingly given importance in nursing education. It was supported by findings that increased knowledge of internet usage will increase deliberate information-seeking behaviors and usage of computers and the internet by nursing students is necessary for their occupation.

Materials and methods: This study aimed to determine the strategies of searching and interpreting information in the internet environment of nursing students studying in classical and integrated education programs and these strategies differ according to demographic variables. The descriptive study design was used. The sample of the study consisted of two nursing students of the Faculty of Health Sciences who applied two different education methods in 2017- 2018 years. Nursing students (672) were sampled. The data were collected with "Information Commitment Scale". Ethics Board approval and written permission were provided by the nursing schools.

Results: "Multiple Sources as Accuracy" and "Technical Issues as Usefulness" factors average score of the students studying with the integrated education model was found to be higher than the students who were studying in classical education ($p < .05$, $p < .001$). Differences were found in sub-factors according to gender, class level, frequency of daily internet usage and computer usage level ($p < .05$, $p < .01$).

Conclusion: The students who are educated with integrated education model have higher scores in "Multiple Sources as Accuracy" and "Technical Issues as Usefulness" factors.

Keywords: *Online Information Seeking, Interpretation Strategies, Nursing Students, Integrative Education*

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INTRODUCTION

The profession of nursing focuses on improving health, protecting it and preventing diseases. Putting scientific knowledge into practice, approaching problems systematically, standardizing care, achieving quality in care, and assessing care are possible with the "nursing process" (1). It is important to improve the decision-making skills (being able to use theoretical and practical information) of all professionals who provide healthcare, especially nurses. Therefore, the nurse has a key role in following scientific and technological developments, reaching the most accurate information in solving a problem and using this information effectively in the decision-making process, making the right and effective decisions and implementing these. Everyone seeks information and shows his/her own thoughts while searching for information. Nursing students and clinical nurses needed enhancement of their information-seeking skills (2,3,4). According to Asemi (2005), an internet user or researcher should have a set of main skills to be able to find information that they need in the internet's ocean of information. These skills are their awareness of the validity, reliability, and usefulness of the information they will obtain on the web (5) However, it is known that nurses have shortcomings about using computers, and therefore, nursing students should be led to be aware of and interested in technology before they graduate (2,6).

Background

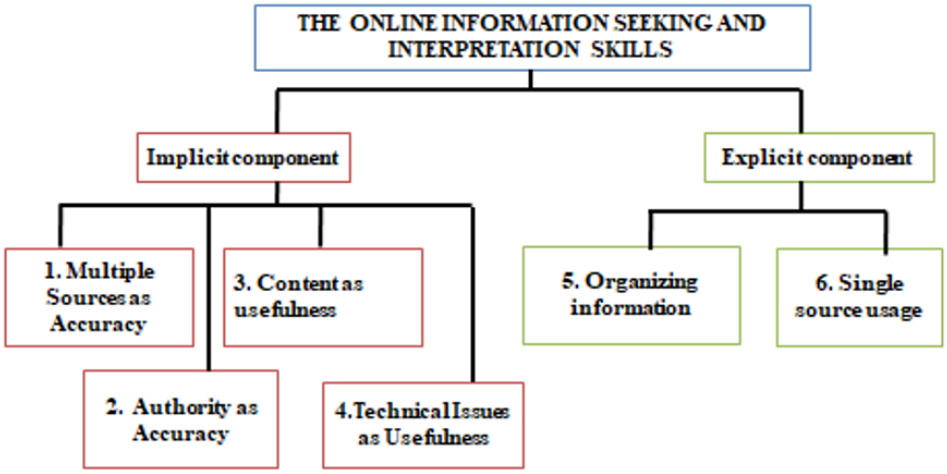
It is important that students use information search strategies and how they evaluate the information they obtain as a result (7). Tsai (2004) stated that various standards that are used by students with individual differences to seek and interpret information on the web are useful in interpreting the accuracy and usefulness of the information in web-based learning environments. The same study observed that standards guide the information seeking strategies of students, standards of interpreting web materials are used implicitly, and standards of information seeking strategies on the web are used explicitly (8). Accordingly, the student's search and interpretation of information involves two components. First one covers the interpretation standards (implicit component) for assessing web material, while the second one covers the information seeking strategies (explicit component) used by students on the web (7,8). Based on the theoretical framework by Tsai (2004), a scale was developed by Wu and Tsai (2005) on the information seeking and interpretation strategies of university students who seek information in the web environment (8,9) (Figure 1).

It was supported by findings that increased knowledge on internet usage will increase deliberate information seeking behaviors and usage of computers and the internet by nursing students is necessary for their occupation (93.5%) (6,10). For example, it was reported that computer training-instruction in nursing education has effects like reducing the time required for education-training (57.8%), making it easier to keep knowledge for a long time (75.8%), increasing the quality of education and training (83.6%) and affecting the professional career (97.7%) (2). It was seen that nurses who had high computer usage attitude scores also had high skill levels of clinical decision-making and there is a strong relationship between computer usage and attitudes towards healthcare and computer literacy (4,11,12). Two different studies observed that nurses had medium-level skills of using computers (12,13).

In the classical education curriculum, basic courses that are present in the system are given by using active or classical teaching methods, as traditional-classical education involves knowledge transfer, the characteristics of students other than their subject area and professional skills are not developed sufficiently (14,15). Integrated education programs in nursing have been structured from health to disease, including basic knowledge, attitudes and skills of the relevant subject areas. Since nursing problems are not limited to a single discipline and require knowledge integration for problem solving skills, the integration model is increasingly given importance in nursing education (16). Based on all this information, the aim of this study was to determine the strategies of searching and interpreting information

in the internet environment of nursing students studying in classical and integrated education program and to determine whether these strategies differ according to demographic variables.

Figure 1. Scale Developed By Wu and Tsai (2005) and Sub-Factors of the Scale



METHODS

Participants

Sample Groups: The sample of the study consisted of two nursing students of the Faculty of Health Sciences who applied two different education methods in 2017- 2018 academic year. Nursing students (672) from the first (n: 317/450 = 70.4%) and second (n: 355/646 = 55%) were sampled. The training methods applied in schools are as follows.

1. School Education Method: Integrated education method is applied.

2. School Education Method: Classical learning method is applied. Each department has two months of theoretical lectures and two months of internship.

Study Design

This descriptive study was conducted from May to June 2018 at two nursing faculty in Turkey. The students were informed about the aim of the study, and written consent was obtained. The data were collected in the classrooms after classes were completed. Data collection forms were distributed by the researchers, and the students took approximately10 minutes to complete the forms.

Instrument

The data that were collected for the objective of the study were obtained by using the "Information Commitment Scale" (ICS) which was developed by Wu and Tsai (2005) (9). Permission was received via e-mail from Geçer and İra to use the inventory. The adaptation of the scale into Turkish culture was carried out by Geçer and İra (7). The scale consists of six dimensions as "Multiple Sources as Accuracy", "Authority as Accuracy", "Content as usefulness", "Technical Issues as Usefulness", "Elaboration and Exploration as Searching Strategy" and "Single source usage". In this study, the items were applied as a 5-point Likert-type scale and analyzed. Considering that the range width of scales is calculated by the formula "series width / number of groups", the arithmetic mean ranges to be used in the analysis of the findings in the study were determined as; "1.00-1.80=Absolutely disagree", "1.81-2.60=Disagree", "2.61-3.40=Somehow agree", "3.41-4.20=Agree" and "4.21-5.00=Absolutely agree". The scores in the scale are determined based on subfactors (7,10). The Cronbach's alpha internal consistency coefficient of the scale was 0.82, and in our study, it was 0.831.

Statistical Analysis

The data were analysed by using the SPSS 22.0 software, and the level of significance was accepted as 0.05. The Kolmogorov-Smirnov test

was used to evaluate whether the distribution of variables was normal. In statistical comparisons, descriptive statistics, t-tests and analysis of variance (ANOVA) were used to analyse normally distributed variables.

Ethical Approval

Ethics Board approval and written permission were provided by the nursing schools. The participants were informed about the aims and scope of the study, and participation was voluntary. Participant identities were kept strictly confidential.

RESULTS

The participants (31.5%) were 2nd-year students, their mean age was 20.6±2.06, 81.7% were women, and 40.3% used the internet for 4 hours or longer in a day. 97.2% preferred "Google" as a search engine, 74.0% stated that they used computers on an intermediate level, and most participants stated that they were active on the internet for reaching entertainment-related information (72.2%) and obtaining information on any subject (61.8%). Moreover, 72.8% had access to the Internet at home (Table 1).

As seen in Table 2, among the online information seeking-interpretation strategies of the participants, the highest mean value was in the 6th factor of "Single source usage" ($\bar{x}$=2.88), while the lowest mean value was in the 1st factor of "Multiple Sources as Accuracy" ($\bar{x}$ =2.08). Generally looking into the factors, it may be understood that the online information seeking, and interpretation strategies of the participants were low.

According to the results of the analysis, a significant difference was found in the strategies related to "Multiple Sources as Accuracy" and "Technical Issues as Usefulness" factors ($p<.05$, $p<.001$). According to t-test analysis results; the average score of the students studying with the integrated education model was found to be higher than the students who were studying in classical education (Table 3).

According to the results of the independent-samples t-test that was carried out to determine whether or not the online information seeking-interpretation strategies of the participants differed based on their sex, there were significant differences between the sexes in terms of the factors of "Authority as Accuracy", "Technical Issues as Usefulness", "Organizing information" and "Single source usage" ($p<.05$, $p<.001$). While the scores of the male students were higher in the factors of "Authority as Accuracy" and "Organizing information", the female students had higher scores in the factors of "Technical Issues as Usefulness" and "Single source usage" (Table 4).

According to the results of the ANOVA test that was conducted to determine whether or not the Web information seeking-interpretation strategies of the participants differed based on their class year, there were significant differences among the class years in terms of the factors of "Content as Usefulness" [$F_{(3-668)}$=3.815; $p<.05$] and "Technical Issues as Usefulness" [$F_{(3-668)}$=2.694; $p<.05$]. Accordingly, the mean scores of the 4th-year students were higher than those of the 1st-, 2nd- and 3rd-year students (Table 5).

According to the other results, there was a significant difference based on the daily internet usage frequency of the participants in the factor of "Organizing information" [$F(4-667)=3.346$, $p<.01$]. If was determined that this difference was caused by the participants who used the internet for 1 hour a day, and these participant's mean scores were higher than those who used the internet for 2 hours or longer a day. It was seen that there was a significant difference based on computer usage levels in the factor of "Authority as Accuracy" [$F(2,669)=6.446$ $p<.01$], and the scores in this factor were higher among the students who were advanced computer users.

Tablo 1. Descriptive Characteristics (N=672)

Class	**n**	**%***
1st year	153	22.8
2nd year	212	31.5
3rd year	179	26.6
4th year	128	19.0
Age MEAN±SD; 20.6±2.06		
Sex		
Female	549	81.7
Male	123	18.3
Frequency of internet usage (daily)		
1 hour	95	14.1
2 hours	145	21.6
3 hours	161	24.0
4 hours of longer	271	40.3
Search engine		
Google	653	97.2
Yahoo	12	1.8
AltaVista	4	.6
Other	3	.4
Level of computer usage		
Beginner	103	15.3
Intermediate	497	74.0
Advanced	72	10.7
Activities Preferred on the Internet [a]		
Research	414	61.6
e-Mail	199	29.6
Journal Search	67	10.0
Accessing Entertainment-Related Information	485	72.2
Obtaining Information on Any Subject	415	61.8
Chatting	414	61.6
Joining Discussions	24	3.6
Downloading Text	121	18.0
Downloading Software	52	7.7
Place of Accessing the Internet		
Home	489	72.8
School	63	9.4
Internet café	9	1.3
Other	111	16.5

[a]: Multiple answers.
*: Percentage among 672 people.

Tablo 2. Online Information Seeking-Interpretation Strategies

Factor No	Online Information Seeking - Interpretation Strategies	n	$\bar{x}$	Ss
1	Multiple Sources as Accuracy	672	2.08	0.68
2	Authority as Accuracy		2.10	0.64
3	Content as usefulness		2.16	0.60
4	Technical Issues as Usefulness		2.80	0.77
5	Organizing information		2.11	0.53
6	Single source usage		2.88	0.89

Tablo 3. Comparison of Information Search and Interpretation Strategies in Web Environment According to Integrated and Classical Education Method Classical Method (N=672)

ICS	Training Method	n	$\bar{x}$	SS	t	p
1. Multiple Sources as Accuracy	Integrated Method	317	4.31	1.35	**4.659**	***.049****
	Classical Method	355	4.00	1.37		
2. Authority as Accuracy	Integrated Method	317	8.50	2.63		
	Classical Method	355	8.36	2.49	.467	.494
3. Content as usefulness	Integrated Method	317	11.05	2.93	2.939	.087
	Classical Method	355	10.65	3.13		
4. Technical Issues as Usefulness	Integrated Method	317	11.64	3.05	**10.844**	***.001****
	Classical Method	355	10.86	3.05		
5. Organizing information	Integrated Method	317	10.62	2.26	.380	.538
	Classical Method	355	10.49	3.03		
6. Single source usage	Integrated Method	317	8.82	2.65	2.504	.114
	Classical Method	355	8.49	2.69		

* Significant at 0.05 level. ** Significant at 0.01 level.

Tablo 4. Comparison of Online Information Seeking-Interpretation Strategies Based on Sex

ICS Factors	Sex	n	$\bar{x}$	SS	t	p
1. Multiple Sources as Accuracy	Female	549	2.06	0.64	-1.839	
	Male	123	2.19	0.83		.066
2. Authority as Accuracy	Female	549	2.07	0.60	-3.282	***.001****
	Male	123	2.27	0.74		
3. Content as usefulness	Female	549	10.75	2.86	-1.671	.095
	Male	123	11.27	3.76		
4. Technical Issues as Usefulness	Female	549	11.38	3.09		***.006****
	Male	123	10.57	2.96		
5. Organizing information	Female	549	10.37	2.57		***.000*****
	Male	123	11.38	3.06		
6. Single source usage	Female	549	8.75	2.64		***.038****
	Male	123	8.18	2.80		

* Significant at 0.05 level. ** Significant at 0.01 level. *** Significant at 0.001 level

Tablo 5. Comparison of Online Information Seeking-Interpretation Strategies Based on Class Level

Class	**1st year**	**2nd year**	**3rd year**	**4th year**			Intergroup difference
ICS Factors	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	F	p	
1.Multiple Sources as Accuracy	2.07	2.06	2.08	2.15	.495	.686	-
2. Authority as Accuracy	2.11	2.08	2.07	2.18	.999	.393	-
3. Content as Usefulness	2.15	2.10	2.14	2.32	3.815	***.010***	1-4; 2-4; 3-4
4. Technical Issues as Usefulness	2.70	2.77	2.81	2.96	2.694	***.045***	1-4; 2-4;
5. Organizing information	2.08	2.08	2.10	2.19	1.449	.227	-
6. Single source usage	2.84	2.83	2.86	3.02	1.312	.269	-

DISCUSSION

Nursing, information communication, and information literacy skills are essential for nurses. While it is known that nursing students spend an effort to increase their computer skills over the basic level, experts focus on the development of effective strategies for education and information, basic computer skills, and teaching more complex information and knowledge (17). Besides nursing professionals do search health information for patient care and recovery purposes. Information technology has a greater role to play in disseminating timely information on varied health areas (3). Based on this, our findings were discussed with the literature data.

The "Single source usage" of the student who searches for and interprets information on the web was called the "Simple Information Strategy" as it was considered that the student does not spend much effort to access information. While students are searching for information, if the information is presented with animations or various visuals, if it does not take much time to obtain the information, or, if no password or registration is needed, they think this information is useful for them (9,18). Likewise, this study found that the highest mean scores of the participants regarding their online information-seeking-interpretation strategies were in the factor "Single source usage". On the other hand, the study by Liang and Tsai (2009) which was conducted with medical students revealed that this strategy was the least preferred one (19). Considering studies where different results were obtained in terms of the strategies that received the highest scores, these were "Organizing information" in the study by Geçer and İra (2014), "Information information-seeking-interpretation strategies in the study by Wu and Tsai (2005), "Authority as Accuracy" in the study by Geçer et al. (2017) which was conducted with prospective physical education and form teachers (7,9,18). Different results obtained by studies conducted with students may be associated with differences in the web usage and information-seeking skills of students enrolled in different fields of education, as well as differences in the information they need.

According to the results of the studies conducted in nursing students studying with integrated education method, it was found to be effective in discovering information and critical thinking, in the development of problem-solving and assertiveness levels (20,21). In our study, it was found that the scores of the students studying with the integrated education model were higher in the strategies related to "Multiple Sources as Accuracy" and "Technical Issues as Usefulness" factors. In other words, it can be said that integrated education students adopt complex information search strategies while searching for information on the internet, question it in reaching scientific information, and adopt effective information search strategies. Different models of education strategies could not be reached on the web information seeking-interpretation strategies related to the study re-

sults. However, the integrated education model suggests that students are more advanced in their strategies to reach information on the web as well as the results that improve knowledge, critical thinking, and problem-solving skills.

While there are studies in the literature which reported that information seeking strategies did not differ based on sex (7,18,22,23). Another study reported that male students used the internet more, and the department and internet connection frequency of the participants were significantly related to their views on using computers and the internet (6). In this study, while the scores of the male participants were higher in the factors of "Authority as Accuracy" and "Organizing information", the scores of the female participants were higher in the factors of "Technical Issues as Usefulness" and "Single source usage". As opposed to our finding, Wu and Tsai (2007) conducted a study in Taiwan with university students/graduates (n=1220) determined that male students used the "Single source usage" aspect more frequently in comparison to female students (9). Considering the studies where different strategies became prominent based on sex, Geçer (2017) stated that male students had higher scores in the "Multiple Sources as Accuracy" factor (18). Kurulgan and Argan (2007) who investigated the information-seeking behaviours of students in the web environment, stated that male students and students who were studying for four-year degrees had higher frequencies of using the internet and higher efficacy levels of information-seeking behaviours. Studies usually reported that men use online information-seeking strategies more effectively and productively in comparison to women (24). The reason for the findings in the literature that men get higher scores in comparison to women in terms of strategies related to online information-seeking behaviours may be explained as those men, who follow technologic developments more closely in comparison to women, have better skills of using computers and the internet. Different results are obtained based on sample size, rates of men-women and the department that is studies. We believe that conducting studies with larger samples where different groups are compared will increase data diversity and reliability. The high number of women in the nursing profession may have consequences in this way.

Our study found the mean scores of the 4th-year students higher than those of the 1st-, 2nd- and 3rd-year students. Similarly, Geçer et al. (2017) calculated the scores of 4th-year students in the factor of "Multiple Sources as Accuracy" in the web environment to be higher than those of 1st-year students (18). Accordingly, it may be stated that, as the class levels of students increase, their information-seeking strategies and their awareness on this issue also increase.

It was determined in the literature that daily durations of using the internet affect online information-seeking strategies and the affected factors differ in different studies, whereas these results support our finding in this study (7, 18). In our study, the "Organizing information" scores of the students who used the internet for one hour a day were higher than those of the students who used the internet for two hours or longer a day. It was stated that users who spend more time on the web have more knowledge about the web environment, and they gain their information-seeking skills in this environment. In parallel to this information, the scores in the factor of "Authority as Accuracy" were found to be higher among the participants in our study who stated they were advanced computer users, while it may be argued that advanced computer users use official and expert websites deliberately.In relation to the development and diversification of information and communication technologies today, individuals use the internet frequently as their main reference for accessing the information they need. While computers are an effective part of the healthcare system, not only establishment of information and communication technologies but also their usage in healthcare services demonstrate the importance of accessing scientific information. Thus, instruction environments that may develop nursing students' online information seeking-interpretation strategies should be created, nursing educators should adopt curricula that support the integration of technology, and the learning outputs of students should be assessed (25).

CONCLUSION

In this study; in general, nursing students use simple search strategy, the students who are educated with integrated education model have higher scores in strategies related to "Multiple Sources as Accuracy" and "Technical Issues as Usefulness "factors and adopt complex information search strategy while searching for information on internet, there is a difference in the strategies of searching for information on the web by gender, It was concluded that the arithmetic mean of the 4th grade students was higher than the other grade students. It is recommended to design studies that focus on educational methods developed for nursing students to access information over the web, accessing reliable information, using accurate information sources, and the usefulness of the information obtained.

Conflict of interest

No potential conflict of interest was reported by the authors.

Authors' contribution

Idea: HB, HC, ZŞY, DA
Design: HB, HC, ZŞY, DA
Materials: HB, HC, ZŞY
Data Collection and/or Processing: HB, HC, ZŞY
Analysis and/or Interpretation: HB, HC, ZŞY, DA
Literature Review: HB, HC, ZŞY
Critical Review: DA

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