Innovativeness Levels and Perceived Barriers to Innovativeness of Nursing Students

Hemşirelik Öğrencilerinin Yenilikçilik Düzeyleri ve Yenilikçiliğin Önünde Algıladıkları Engeller

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ABSTRACT

Individual innovativeness feature is the major key to successful innovation. An examination of situations perceived as obstacles to innovativeness will help to establish an innovative culture correctly and planned manner. The study was conducted to determine innovativeness level and the obstacles to innovative behavior of nursing students. This was a descriptive, cross-sectional study. 279 nursing students were included in the study. The demographic form, Individual Innovativeness Scale, and the Barriers to Innovativeness Questionnaire were used for data collection. The average individual innovativeness score of the students was 63.53 ± 8.58, which is a low level of innovativeness. The major barriers of the innovativeness were lack of different lessons to support creativity, not planning adequate activities to support innovation by educational institutions, and inability to reach current information effectively due to lack of knowledge of the foreign language, respectively. As a result of the study, the level of innovativeness of nursing students was low and major barriers of innovativeness were about education. It was suggested that the content of nursing education should be innovative, creative, entrepreneurial, and use innovative teaching methods.

Keywords: Barriers to Innovativeness, Cross-Sectional Study, Individual Innovativeness, Nursing Education, Nursing Students.

ÖZ

Bireysel yenilikçilik başarılı inovasyonun anahtarıdır. Yenilikçiliğe engel olarak algılanan durumların incelenmesi, doğru ve planlı bir şekilde yenilikçi bir kültür oluşturulmasına yardımcı olacaktır. Yapılan araştırma hemşirelik öğrencilerinin yenilikçilik düzeylerini ve yenilikçi davranışlarının önündeki engellerin belirlenmesi için yapılmıştır. Bu araştırma tanımlayıcı ve kesitsel türdedir. Çalışmaya 279 hemşire öğrenci dahil edilmiştir. Verilerin toplanmasında demografik özellikler bilgi formu, Bireysel Yenilikçilik Ölçeği ve Yenilikçiliğin Önündeki Engeller Anketi kullanılmıştır. Öğrencilerin ortalama bireysel yenilikçilik puanı 63.53 ± 8.58 olup düşük yenilikçilik düzeyindedir. Yenilikçiliğin önündeki en büyük engeller, yaratıcılığı desteklemek için farklı derslerin olmaması, eğitim kurumları tarafından inovasyonu desteklemek için yeterli faaliyetlerin planlanmaması ve sırasıyla yabancı dil bilgisinin eksikliğinden dolayı mevcut bilgilere etkili bir şekilde ulaşılamaması olarak belirlenmiştir. Çalışma sonucuna göre hemşirelik öğrencilerinin yenilikçilik düzeyi düşük ve yenilikçiliğin önündeki başlıca engeller eğitim ile ilgiliydi. Hemşirelik eğitimi içeriğinin yenilikçi, yaratıcı, girişimci olması ve yenilikçi öğretim yöntemleri kullanması önerilmektedir.

Anahtar Kelimeler: Bireysel Yenilikçilik, Hemşirelik Eğitimi, Hemşirelik Öğrencileri, Kesitsel Çalışma, Yenilikçiliğin Önündeki Engeller.

INTRODUCTION

Innovativeness, which contains reactions to innovations, is the readiness to change, preparedness to try new things, and fast conformation to innovation.[1,2,3] According to Rogers' Diffusion of Innovation model, persons are reserved into five categories with respect to innovativeness characteristics: innovators, early adopters, early majority, late majority, and laggards. Innovators are people who enjoy trying new ideas and take risks. Early adopters are people who represent opinion leaders, are already aware of the necessity of change, and are very comfy adopting new ideas. Early majorities are rarely leaders, but they do accept new ideas before the normal persons. They are cautious about innovations. Late majorities are skeptical of changing and only accept an innovation after it has been tested by the majority. Laggards look at prejudice against change and bring up rear about the tendency to adopt the innovations at last. In addition, they want innovation to be tried by others before they adapt to innovation.[4]

In the nursing profession within the health care system where constant change and development are experienced, a process of rapid innovation due to technological and scientific developments is experienced. Innovation is not a new concept in nursing. The International Council of Nurses (ICN) (2009) defines innovation as the process of developing new approaches, technologies, and ways of working.[5] Innovation in nursing means encouraging nurses to use their knowledge and abilities to change old methods of thinking and apply and develop new approaches to working that actually enhance nursing practice.[6]

Innovation can apply to tools, technologies, and processes, or to the way an organisation or an individual behaves or works. Nurses work in all environment with all types of patients, families, societies, healthcare staff, and employees in other sectors. Nurses agree that their efforts should ensure innovative solutions to the challenges and demands of healthcare provision. Therefore, nursing innovation is basic building block for development in health care systems. To determine nursing care needs and to meet these requirements, nurses need to be innovative individuals, be open to innovation, not refuse innovation approaches, think and apply innovations, and use innovative roles effectively.[5] Innovative behavior and innovative practices in nursing provide increased productivity and profitability by increasing the quality and effectiveness of health care. There are studies showing that innovative behavior improves the quality of care, the productivity of work and the effectiveness of treatment which reduces health care costs and facilitates access to health services.[6,7,8]

From the point of view of nursing education, it is necessary to train nurses who can adapt to progress in healthcare technologies, are able to provide high-quality healthcare services, can change old practices in response to the different needs and expectations of society.[9] Nursing education institutions around the world try to train innovative nurses, expanding their training capacities by applying innovative strategies to meet the need for qualified individuals in the future.[5] Nursing students should acquire professional values during their vocational training and be trained to be open to innovation and to adapt to change.[10]

In order to ensure changes in nursing, it is important to support innovativeness in nursing students and to remove barriers to innovativeness. It is stated that barriers to being innovative are individual, institutional or social factors. Personal properties are fundamental of the innovativeness. In addition, innovativeness develops through education or within the working institution and takes form with respect to social traits. Factors related to higher education institutions, which affect the innovativeness of the individual negatively, are lack of source and substructure, the incompatibility of educational programmes with innovativeness, the lack of quality educators and a traditional education approach.[11] To provide a balance between developing technology, maintenance

cost and quality of care, it is necessary to think deeply about how the nature of innovation, how it is done, and how innovation should be taught. It is recommended to include a high level of creativity and innovativeness in nursing education.[12] An examination of situations perceived as obstacles to innovativeness helps to establish an innovative culture correctly and planned manner. In our country, there is a limited number of studies evaluating the level of innovativeness of nursing students and the barriers to innovativeness. Therefore, this study is important in terms of determining the innovative characteristics and the factors that influence nursing students. It is thought that the results of the study will give cues to nurse educators and managers on innovative strategies that will increase the innovative behavior of nursing students.

This study was conducted to determine the individual innovativeness characteristics of nursing students and the perceived barriers to innovative behavior. Research questions were followed:

1. What is the innovativeness level of nursing students?

2. Which factors influence the innovativeness level of nursing students?

3. What are the perceived barriers to innovativeness of nursing students?

MATERIALS AND METHODS

Study Design and Setting

A descriptive, cross-sectional design was used to explore the individual innovativeness characteristics of nursing students and the barriers to innovative behavior. The study was conducted in a nursing department of a health sciences faculty located in the west of Turkey that provides education at the undergraduate level. There were no courses about innovativeness, innovation, entrepreneurship, creativity, or critical thinking in the curriculum of the nursing department where the data were collected.

Population and Sampling

The population of the study was 774 nursing students who were enrolled in the nursing department of the university. The minimum sample size was calculated by using the Yamane method.[13] The sample size calculated as minimum 257 with confidence interval 0.05 and with a confidence level of 95%. With added the estimated data losses, 282 participants, 10% more than the minimum size of samples, were invited to study. The study was completed with 279 nursing students.

Data Collection and Questionnaires

Data was collected in March-April 2018. The demographic forms, the Individual Innovativeness Scale and Barriers to Innovativeness Questionnaire were used for collecting data. Information was given to the students by researchers about the purpose of study. The students who agreed to participate in the study completed the questionnaires. Completing the questionnaires lasted approximately 10-15 minutes.

Demographic Form

In this form, there were 10 questions about gender, age, academic year, academic grade average, attendance at seminars/conferences on innovation, family income status, place of residence, and mother and father's education level.

Individual Innovativeness Scale (IS)

The scale made up of 20 five-point Likert-type items, was used to measure the innovativeness levels of the individuals. The lowest score is 14 points, and the highest is 94 points.[3] IS consists of four sub-dimensions: resistance to change, risk-taking, openness to experience, and opinion-leading. Calculated scores show the individual innovativeness level. According to the total score of IS,

innovativeness categories are as follows: over 80 point is the innovator, between 69 and 80 point is the early adopter, between 57 and 68 point is the early majority, between 46 and 56 point is the late majority, and below 46 point is the laggards. In addition, those whose scale score is above 68 is called highly innovative, those between 68 and 64 is called moderately innovative, and those below 64 is called low level innovative. The scale was adapted into the Turkish by Kılıçer and Odabaşı (2010).[14] The Cronbach alpha coefficient of the original scale and the Turkish scale were 0.89 and 0.82, respectively.[3,14] The Cronbach alpha coefficient of IS was 0.72 in the current study.

Barriers to Innovativeness Questionnaire (BIQ)

The scale was developed by Kılıçer and Odabaşı (2013) to determine the barriers perceived by the persons regarding innovativeness. The scale contains 40 five-point Likert-type items consisting of three sub-dimensions; individual barriers (10 items), institutional barriers (23 items), and social barriers (7 items). The Cronbach alpha coefficient of the original scale is 0.91.[11] The Cronbach alpha reliability coefficient of the study was 0.94.

Data Analysis

Data were analysed with PASW 18. Means, standard deviations, and per centages were used to evaluate descriptive characteristics. In comparing the data, the Mann Whitney U test was used as a nonparametric test, and an independent samples t test and a one-way ANOVA test were used as a parametric test. The significance level was accepted as $p < 05$.

Ethical Aspect of Research

Approval for conducting the study was obtained from the ethical board (60116787-020/17131 on 07 March 2018). A written permission was obtained from the Dean's Office of Faculty of Health Sciences. Information about the study was given to the participants and verbal informed consent was obtained.

RESULTS AND DISCUSSION

The socio-demographic characteristics of nursing students were shown in Table 1. The average age of the participants was 20.58 ± 2.02 and 81.0% were females. 61.6% of the participants followed nursing innovations, and 90.3% did not receive training on innovativeness/innovation. The mean IS score of the students was 63.53 ± 8.58, which is a low level of innovativeness (Table 2). This result is similar to studies related to the innovativeness profile of nursing students in Turkey.[15,16] In addition, Korucu and Olpak (2015)[17] reported that education faculty students were at a low level of innovativeness in their work, similar to current study findings.

Table 1. Characteristics Of Nursing Students

	n	%
Gender		
Female	226	81.0
Male	53	19.0
Class		
First class	66	23.7
Second class	68	24.4
Third class	70	25.1
Fourth class	75	26.9
Mother education level		
Illiterate	16	5.7
Primary school	167	59.9
Middle School	37	13.3
High school	48	17.2
University	11	3.9

Table 1. (Contiuned) Characteristics Of Nursing Students

	n	%
Mother occupation		
Housewife	223	79.9
Official	13	4.7
Worker	32	11.5
Self-employed	11	3.9
Father education level		
Illiterate	6	2.2
Primary school	110	39.4
Middle School	62	22.2
High school	59	21.1
University	42	15.1
Father occupation		
Non employment	36	12.9
Official	53	19.0
Worker	80	28.7
Self-employed	110	39.4
Family economic status		
Low income	204	73.1
Balanced to income	49	17.6
High income	26	9.3
Receive training on innovativeness and innovation		
Yes	27	9.7
No	252	90.3
Follow the nursing innovations		
Yes	172	61.6
No	107	38.4

According to innovativeness categories, 56.3% of the students were early majority, 21.5% were early adopters, 17.6% were late majority, and 1.4% were Laggards. Only 3.2% of the students were in the innovator category (Table 2).

Table 2. Innovativeness Categories and IS Score Mean Of Nursing Students

	n	%
Innovativeness Categories		
Innovator	9	3.2
Early adopter	60	21.5
Early majority	157	56.3
Late majority	49	17.6
Laggards	4	1.4
	Mean	**SD**
IS score mean	63.53	8.58

Notes: IS: Individual Innovativeness Scale

In the Diffusion of Innovation model, Rogers (1995) stated that 2.5% of the respondents were innovator, 13.5% were early adopters, 34% were the early majority, 34% were the late majority and 26% were laggards.[4] Tung, Akkadechanunt and Chontawan (2014) found that the majority of nurses (96.88%) had a low level of innovative behavior.[18] In Turkey, in the study performed by Bodur (2018), it was found that 49.0% of nursing students were early majority, 42.6% were early adopters, and 7.7% were innovators.[15] Studies of the education faculty reported that the majority of students are in the early majority category.[17,19] In studies conducted with students in different departments; Yeğin (2017)[20] worked in a theology faculty and Eröz (2017)[21] in a tourism faculty, and they reported that the majority of the students were in the early adopter and early majority categories. The results of the study, like others, showed that the majority of the students were in the early adopter and early majority categories. These findings suggest that the majority of university students in our country are in the early adopter and early majority groups.

There was no statistically significant difference between IS score of students in terms of gender, academic grade average, father's education level and occupation, or family income status ($p > 0.05$). A statistically

significant difference was found between the IS score and innovation training (Z=-3.038, p=0.003), follow-up of innovations (t=3.008, p=0.003), maternal working status (t=-2.953, p=0.003) and maternal education level (t=-2.503, p=0.041) (Table 3).

Table 3. Comparison of The Demographic Characteristics and IS Scores of Nursing Students

	n	Mean±SD	t/Z	p
Receive training on innovativeness and innovation				
Yes	27	68.22±8.95	Z=-3.038	.003
No	252	63.02±8.40		
Follow the nursing innovations				
Yes	172	64.73±8.73	t= 3.008	.003
No	107	61.59±8.00		
Mother's Working Status				
Working	56	66.69±8.25	t= -2.953	.003
Not working	223	62.73±8.49		
Mother education level				
Up to 5 years	183	62.77±8.94	t= -2.503	.041
More than 5 years	96	64.97±7.68		

Notes: IS: Individual Innovativeness Scale

The factors affecting innovativeness are divided into three categories: personal factors (demographic, social characteristics and personality traits), social and cultural environment-related factors, and situational factors.[22] In the study, there was a statistically significant difference between the IS score and the scores reflecting maternal working status and maternal education level. This result is not surprising when it is considered that mothers are primarily responsible for a child's care and education in Turkey. The other findings showed that age and gender did not affect the level of innovativeness of the students. In the United Kingdom, Martin et. al (2017) reported that psychology, management, fine arts, and education faculties students' age and genders did not affect their level of innovativeness.[23] In Greece, Babalis et. al (2012) found that there is no relationship between the innovative thinking status and gender of university students in their studies.[24] When the studies carried out in our country are examined, Özgür (2013)

reported that there is no relationship between students' level of innovativeness and gender in the study conducted in the Department of Information Technology Teaching.19 Similarly, Kert and Tekdal (2012) found that there was no relationship between gender and the level of innovativeness of university students training in different faculties.[25] These are consistent with the findings of current study.

Nursing is a profession that plays a key role in health care. One of the most important criteria for professionalism in nursing is a qualified education.[26] For nursing students, professional knowledge, understanding of current scientific research results and critical thinking is necessary to support their ability of creativity.[27] Nursing students must acquire their professional values, be open to innovation, and adapt to change, during the vocational training.[10] In the study, according to students, the highest scores from the obstacles to innovativeness were lack of different lessons to support creativity and lack of planning of adequate activities to support innovation by educational institutions. There is no course about innovation in the curriculum of the nursing department where the data were collected, and the majority of students did not receive training in innovation. However, most of the students stated that they follow the innovations related to nursing. In addition, students who are trained and follow innovations have higher levels of innovativeness. This result shows the importance of education in improving characteristics of innovativeness. Similarly, Uluyol (2013) reported that innovation and entrepreneurship training increased the level of innovativeness of students.[28] To train innovative individuals, innovativeness, entrepreneurship, and creativity must be instilled in persons from an early age.[29] Absence of education cannot be considered where there is inovativeness. Education and innovativeness affect each other mutually. Education shapes innovativeness and supports its development, while innovativeness increases the quality of education. Innovativeness is not an inherent ability;

instead of it must be acquired through training, instruction and cultivation.[30,31]

The mean score of the students in the BIQ-individual barriers was 3.62 ± 0.56, the mean score of institutional barriers was 3.67 ± 0.57, and the mean score of social barriers was 3.61 ± 0.61. The barriers with the highest scores were "lack of different lessons to support creativity", "not planning adequate activities to support innovativeness by educational institutions", and "inability to reach current information effectively due to lack of knowledge of the foreign language", respectively (Table 4).

Table 4. The mean score of Barriers to Innovativeness Questionnaire

Barriers	Mean	SD
Individual barriers	**3.62**	**0.56**
High level of costs	3.58	0.93
Reluctance of the individual for chance	3.64	0.92
Religious values of the individual'	3.05	1.19
Being unable to access information in an efficient way due to lack of foreign language	3.81	0.99
Reluctance of the individual for change	3.72	0.92
The fear of being refused by the society	3.54	1.00
Lack of communication skills of the individual	3.60	0.90
The individual's fear of the future	3.81	0.94
Ignorance of the individual towards innovativeness	3.72	0.94
Individuals' avoidance of taking risks	3.78	0.89
Institutional barriers	**3.67**	**0.57**
Educational institutions' inability to plan sufficient activities that support innovativeness	3.83	0.91
Avoiding involving students in projects organised in educational institutions	3.50	0.87
Instructor not to encourage innovativeness	3.67	0.89
Inability of the instructors to be a role model as innovativeness	3.51	0.97
Instructors leaving students alone with problems	3.64	0.99
Insufficiency of student exchange programs	3.72	0.89
Limitedness of technological tools in educational institutions	3.74	0.99
Insufficiency of technical support given by the institution	3.67	0.86
The course content does not contain current topics	3.30	1.04
Institutional culture closed to change	3.47	1.00
Managers not support to innovation	3.45	1.02
Failure to regularly update the technology in educational institutions	3.67	0.91
Instructional process capable of developing high order thinking skills	3.75	0.90
Insufficiency of the technological infrastructure of educational institutions	3.73	0.91
Failure of managers to set innovation-based goals	3.73	0.85
Absence of different lectures providing creativeness	3.90	0.88
Exams or tasks failing to support creativity	3.80	0.93
Insufficient communication of the instructor with students	3.79	0.90
Lack of current publications in educational institutions	3.74	0.92
Insufficiency of instructor exchange programs	3.65	0.87
Instructors' not being able to guide students in innovativeness	3.65	0.91
Instructors transfer their own truths instead of universal right	3.62	0.97
Absence of democratic environment supportive to free thinking	3.78	1.01
Social barriers	**3.61**	**0.61**
Lack of residence qualification to support innovation	3.68	0.95
Social environments failing to support innovativeness	3.73	0.93
Family structures failing to support innovativeness	3.24	1.14
Insufficient cooperation between institutions	3.79	0.86
Insufficient national education policies	3.73	0.94
Social values preventing innovativeness	3.56	0.92
Rapid change in technology	3.51	0.99

Today, scientific and technological developments are experienced at a great pace, and the importance of learning a foreign language has become a necessity. Considering that the top ten languages in the Internet are English, Chinese, Spanish, Japanese eg.[33], it could be stated that the greatest barriers to effective access to information for Turkish students are the inefficiency of language. In order to follow the innovations and changes in the literature and in the world, the students need to know the commonly used languages. In Turkey, Foreign language education is at the top of the topics list that has to be tackled seriously because of has to move with time and internalize the science and produce much more. The students, who participated in the study, stated that their foreign language knowledge insufficient. So they believed that they could not access knowledge of innovations. Similarly, studies conducted in Turkey shows that university students perceive the insufficiency of foreign language as a barrier to innovativeness.[11,16]

In the study, it is remarkable that the number of innovators among the students is low. However, in order to follow and implement innovations, to identify changing needs, and to initiate changes, nurses and nursing students should have some features such as innovativeness, risk-taking, opportunity-oriented, and entrepreneurship. Innovative students can contribute to the nursing profession by producing health technologies and innovative projects, designing products that improve the quality of nursing care, and patenting. In addition, innovative nursing students may structure their professional and individual futures by following scientific and technological developments. Already, the ICN (2009) emphasises that nurses need to be professionals who adapt to developing healthcare technologies, who make changes in patient treatment and care, who improve innovative practices, and who are opinion leader and follow innovations.[5]

In the study, it was determined the extent to which students demonstrate innovative behaviors. Thus, these findings are important in terms of exploring barriers to the development of the nursing profession, the dissemination of new nursing practices, and the adoption of evidence-based care practices.

There were some limitations of the current study. This study was based on a limited number of participants from only one university in Turkey. Therefore, it should not be generalized to the whole population. Furthermore, the insufficient number of studies of the topic in nursing students limits the discussion of the study's findings.

CONCLUSION VE RECOMMENDATIONS

The finding of study is that the level of innovativeness of nursing students is low. Also this study showed that perceived barriers to innovativeness of nursing students which is important for successful in innovation. It is recommended that the nursing education curriculum should be organized in a way that encourages innovativeness in students. The obstacle to innovativeness was primarily about educational institutions. Universities have a key role in the production of innovation, creating new and improved products and supplying training, expertise and human resources to societies and organisations. Therefore, it is recommended that the content of nursing education should be of a quality that would increase innovativeness, creativity, and entrepreneurship by using innovative teaching methods.

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