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Factors related to individual's innovative characteristics of nurses working in a university hospital

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Abstract

This research aimed to study the individual innovativeness characteristics of nurses. The research was carried out with the participation of 165 nurses. The data were collected by using a 21-questionnaire information form, prepared by the researcher in line with the Individual Innovativeness Scale. The data were analyzed statistically. test, Mann-Whitney U test, One-Way Analysis of Variance, and independent samples t-test were used for data analysis. In this study, when the total scores of the nurses on the Individual Innovativeness Scale were evaluated, the ranking of the characteristics from the most to the least common was determined as follows: skeptical, questioning, traditionalist, pioneering, and innovative. Individual Innovativeness Scale scores differ statistically based on nurses' sociodemographic characteristics and work-life characteristics. To improve nurses' innovative behaviors, researchers recommend motivating them to participate in scientific research, providing training on this subject, and providing adequate time and resources.

***Keywords*:** Individual innovativeness; innovation; nurse.

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1. Introduction

During the provision of health care services, nurses are expected to be innovative to respond to the needs of individuals, provide qualified and effective nursing care, transfer innovations to patient care, and fulfill their professional nursing roles with an innovative perspective [1]. Nurses need to have an innovative way of thinking to fulfill their innovative roles [2,3]. In this respect, innovation refers to "the use of new methods socially, culturally, and administratively". Individual innovativeness is defined as "the development, adoption, and implementation of an innovation" [4].

The International Council of Nurses reports the need for an innovative approach in nursing practice to minimize risk factors for health conditions, avoid diseases, improve attitudes towards healthy living, and improve treatment strategies and procedures [5-8]. Innovation plays a key role in improving the quality of nursing care, providing safer care to patients, and improving patient care outcomes [9,10]. Innovative ideas are significant in the effective delivery of nursing care. It is emphasized in the literature that nurses who are open to innovative ideas improve patient care outcomes by increasing the capacity of the existing health system [11].

In this regard, in line with the information to be obtained from this study, the factors affecting the individual innovativeness characteristics of nurses will be determined and appropriate strategies will be developed.

1.1. Purpose of study

This study was conducted to determine the individual innovativeness characteristics of nurses, and answers to the following questions were sought.

- What are the socio-demographic characteristics of nurses?
- What are the working life characteristics of nurses?
- What are the individual innovativeness characteristics of nurses?

2. Material and methods

2.1. Participants

This descriptive study was conducted with the participation of 165 nurses working at a university hospital between 05 August 2019 and 05 October 2019 who agreed to participate in the study. In determining the sample number of the study, the formula used to determine the number of individuals to be sampled in cases where the universe is known was applied [12]. The sample of the study was calculated as 165 with a 90% confidence limit and 5% error among 459 nurses working in the university hospital where the study was conducted. When the sample number is reached, the data collection process is completed. Volunteer nurses who agreed to participate were included in the study.

2.2. Data Collection Tools

Study data were collected using the "Nurses Introductory Information Form" and "Individual Innovativeness Scale". The Nurses Introductory Information Form consists of 21 questions that determine the socio-demographic and working life characteristics of nurses. The questionnaire was pre-administered and tested in a group of 10 people and the nurses who participated in the pilot study were not included in the study group. Before starting the study, ethics committee permission was obtained from the Human Research Ethics Committee Presidency. After the nurses participating in the study were informed about the study and their informed consent was obtained, the data started to be collected by the researchers.

The Individual Innovativeness Scale is a five-point Likert-type scale ("1 Strongly Disagree" and "5 Strongly Agree") developed by Hurt et al. [13] and adapted to Turkish by Kemer and Altuntaş [14] . The scale has three sub-dimensions: "Opinion Leadership", "Resistance to Change" and "Risk

Taking". The Opinion Leadership Sub-dimension contains 7 items (1,3,5,8,9,11,12), the Resistance to Change Sub-dimension contains 7 items (6,7,10,13,15,17,20) and the Risk-Taking Sub-dimension contains 4 items (2,16,18,19). Of the scale items, 11 are positive (1, 2, 3, 4, 7, 8, 10, 11, 14, 16, 17), while seven (5, 6, 9, 12, 13, 15, 18) are negative. The total score that can be obtained from the scale varies between 18 and 90. According to the scoring, 83 points and above are classified as "Innovative", 75-82 points as "Pioneer", 66-74 points as "Inquisitive", 58-65 points as "Skeptic", and 57 points and below as "Traditionalist". The Cronbach's alpha reliability coefficient for the overall scale was found to be 0.82, and the Cronbach's alpha reliability coefficient for the sub-dimensions ranged between 0.72 and 0.80. In this study, the Cronbach's alpha reliability coefficient of the Individual Innovativeness Scale was found to be 0.83, and the Cronbach's alpha reliability coefficients for the Opinion Leadership, Resistance to Change, and Risk-Taking Sub-dimension of the scale were determined as 0.83, 0.81 and 0.75, respectively.

2.3. Ethics and Data collection

It is explained to the nurses that the decision on whether to participate in the study or not belongs entirely to them and that the data to be collected would only be used within the scope of this study. Before collecting the data, ethics committee permission from the institution and informed consent were obtained from the nurses included in the study. Data collection time lasted approximately 15-20 minutes.

2.4. Data Analysis

The data obtained in this study were analyzed using IBM SPSS 22 package software. Shapiro-Wilk and Kolmogorov Smirnov tests were used to determine the distribution normality of quantitative data. Kruskal Wallis test, Mann Whitney U test, One-Way Analysis of Variance, and Independent Sample t-Test were used in the analysis of the data. The reliability of the scales used was analyzed with Cronbach Alpha. Quantitative data were presented in median (minimum-maximum) and qualitative data in frequency (percentage). The significance level was taken as $p<0.05$.

3. Results

It was determined that of the nurses participating in the study, 80.6% were female, 19.4% were male, 61.2% were married, 67.9% had a bachelor's degree, 87.9% had a nuclear family, 52.1% were employed in surgical units, 42.4% were employed in internal diseases units, 5.5% were employed in intensive care units, 92.1% worked as service nurses, 33.9% worked as nurses for 6-10 years, 77.6% had been working in shifts, 73.9% had chosen their profession willingly, 64.8% loved their profession, 60.6% are satisfied with the service they work, 52.7% did not choose their department voluntarily, 37.0% had attended professional, scientific meetings and congresses in the last year, 21.8% had read research in the field of nursing in the last six months, and 21.2% had done postgraduate research. The mean age of the nurses was 31.1±5.5. Table I shows the distribution of the socio-demographic and working life characteristics of nurses.

TABLE I

DISTRIBUTION OF SOCIO-DEMOGRAPHIC AND WORKING LIFE CHARACTERISTICS OF NURSES

Characteristics		**n**	**%**
Age groups	17-26 years old	36	21.8
(31.1± 5.5)	27-36 years old	104	63.0
	37 years old and older	25	15.2
Gender	Female	133	80.6
	Male	32	19.4
Marital Status	Married	101	61.2
	Single	64	38.8
Educational status	Health vocational high school	34	20.6
	Associate degree	13	7.9

	Undergraduate	112	67.9
	Master's degree	6	3.6
Family structure	Extended family	20	12.1
	Nuclear family	145	87.9
	Internal units	70	42.4
Service they work	Surgical units	86	52.1
	Intensive care	9	5.5
Role in the service	Service nurse	152	92.1
	Nurse in charge of the ward	13	7.9
Working year	1-5 years	48	29.1
	6-10 years	56	33.9
	11-15 years	44	26.7
	16-20 years	17	10.3
Manner of work	Only daytime	37	22.4
	Shift	128	77.6
The state of choosing the profession willingly	Yes	122	73.9
	No	43	26.1
The state of liking the profession	Like	107	64.8
	Doesn't like	11	6.7
	Undecided	47	28.5
The state of being satisfied with the unit they work	Satisfied	100	60.6
	Partially satisfied	57	34.5
	Not satisfied	8	4.8
The state of willingly choosing the unit in which they work	Yes	78	47.3
	No	87	52.7
Attendance at professional and scientific meetings/congresses within the last year	Yes	61	37.0
	No	104	63.0
Reading a study in the field of nursing in the last six months	Yes	36	21.8
	No	129	78.2
Status of conducting research after graduation	Yes	35	21.2
	No	130	78.8

Nurses' Individual Innovativeness Scale mean score was found to be 63.3 ± 8.7, and the median score was 60 (47 - 89). Individual Innovativeness Scale Opinion Leadership, Resistance to Change, and Risk-Taking Sub-Dimension mean scores were found to be 25.1 ± 4.5, 22.5 ± 5.0, 15.7 ± 2.4, respectively, and the median scores were 25 (15 - 35), 22 (7 - 35), and 16 (7 - 20), respectively (Table II).

TABLE II
INDIVIDUAL INNOVATIVENESS SCALE TOTAL AND SUB-DIMENSIONAL MEAN SCORES, STANDARD DEVIATION, AND MEDIAN SCORES

Individual Innovativeness Scale	**Mean± Sd**	**Median (Min-Max)**
Opinion Leadership	25.1 ± 4.5	25 (15 - 35)
Resistance to Change	22.5 ± 5.0	22 (7 - 35)
Risk Taking	15.7 ± 2.4	16 (7 - 20)
Total	63.3 ± 8.7	63 (47 - 89)

Min.: Minimum. Max.: Maximum. Sd: Standard deviation

When the total score of the Individual Innovativeness Scale was evaluated, it was found that 32.7% of the nurses were skeptical, 30.3% were questioning, 28.5% were traditionalists, 4.8% were pioneers, and 3.6% were innovative (Table III).

TABLE III
CLASSIFICATION OF INDIVIDUAL INNOVATIVENESS SCALE SCORES

Individual Innovativeness Scale		n	%
82 points and above	"Innovative"	6	3,6
75-82 points	"Pioneer"	8	4,8
66-74 points	"Inquisitive"	50	30,3
58-65 points	"Skeptic"	54	32,7
57 points and below	"Traditionalist"	47	28,5

It was determined that the Individual Innovativeness Scale total score values of the nurses participating in the study differed according to the nurses' duties in the service. It was determined that the total median score value of the Individual Innovativeness Scale of the nurses in charge of the service was higher than the service nurses (p=0.036) (Table IV).

It was determined that the Individual Innovativeness Scale total score values of the nurses participating in the study did not differ according to age, gender, marital status, education level, family structure, service they work, the working year, working status, working style, the state of choosing the profession willingly, the state of loving the profession, the state of being satisfied with the service, the state of choosing the department voluntarily, the status of attending professional and scientific meetings and congresses in the last year, the status of reading nursing research in the last 6 months, and the status of conducting research after graduation (Table IV).

TABLE IV

COMPARISON OF THE SOCIO-DEMOGRAPHIC AND WORKING LIFE CHARACTERISTICS OF NURSES WITH THE TOTAL SCORE VALUES OF THE INDIVIDUAL INNOVATIVENESS SCALE

Characteristics		**Median (Min-Max) Mean± Sd**	**Test value p**
Age groups	17-26 years old	62.6 ± 6.2	F=1.806 p=0.168
	27-36 years old	64.2 ± 9.2	
	37 years old and older	60.8 ± 9.3	
Gender	Female	63 (47 - 89)	U=2037 p=0.707
	Male	62.5 (47 - 81)	
Marital Status	Married	24.9 ± 4.8	t=-0.906 p=0.366
	Single	25.5 ± 4.1	
Educational status	Health vocational high school	63 (47 - 82)	χ^2=3.677 p=0.298
	Associate degree	58 (47 - 89)	
	Undergraduate	64 (47 - 89)	
	Master's degree	64.5 (54 - 74)	
Family structure	Extended family	64.5 (51 - 89)	U=1424.5 p=0.899
	Nuclear family	63 (47 - 89)	
Service they work	Internal units	62.9 ± 7.3	F=0.435 p=0.648
	Surgical units	63.4 ± 9.7	
	Intensive care	65.8 ± 9.4	
Role in the service	Service nurse	62 (47 - 89)	U=642.5 **p=0.036**
	Nurse in charge of the ward	68 (54 - 89)	
Working years	1-5 years	61.6 ± 6.8	F=1.247 p=0.295
	6-10 years	64.3 ± 9.6	

	11-15 years	63.1 ± 9.2	
	16-20 years	65.6 ± 8.8	
Working status	Regular	25.3 ± 4.9	t=1.137
	Contractual	24.6 ± 3.3	p=0.258
Manner of work	Only daytime	65 (47 - 89)	U=1900.5
	Shift	61 (47 - 89)	p=0.067
The state of choosing the profession willingly	Yes	62.5 (47 - 89)	U=2557.0
	No	64 (47 - 79)	p=0.806
The state of liking the profession	Like	64 (47 - 89)	χ^2=1.297
	Doesn't like	63 (47 - 73)	p=0.523
	Undecided	61 (47 - 82)	
The state of being satisfied with the unit they work	Satisfied	63.8 ± 9.1	F=1.244
	Partially satisfied	62.1 ± 8.2	p=0.291
	Not satisfied	66.6 ± 5.9	
The state of willingly choosing the unit in which they work	Yes	25.3 ± 5.0	t=0.517
	No	24.9 ± 4.1	p=0.606
Attendance at professional and scientific meetings/congresses within the last year	Yes	63 (47-77)	U=3018
	No	61.5 (47-89)	p=0.603
Reading a study in the field of nursing in the last six months	Yes	63.5 (51-89)	U=2238
	No	63 (47-89)	p=0.740
Status of conducting research after graduation	Yes	63 (50-89)	U=2125.5
	No	63 (47-89)	p=0.551

χ 2: Kruskal Wallis Test Statistic, U: Mann-Whitney U Test Statistic, F: OneWay ANOVA Test Statistic, t: Student t Test Statistics

4. Discussion

The findings of this study, which was conducted to determine the individual innovativeness characteristics of nurses working in a university hospital located in the Western Black Sea Region in the north of Turkey, were discussed in line with the relevant literature.

The Nurses' Individual Innovativeness Scale total score was 63.3 ± 8.7, while the Opinion Leadership, Resistance to Change, and Risk-Taking Sub-Dimension score values of the scale were determined as 25.1 ± 4.5, 22.5 ± 5.0, and 15.7 ± 2.4, respectively. When the total score of the Individual Innovativeness Scale was evaluated, it was found that nurses had skeptical, questioning, traditional, pioneering, and innovative characteristics respectively. Bekar et al. [15] determined that nurses' total score on the Individual Innovativeness Scale was 62.8 ± 7.8, and the mean scores of the Opinion Leadership, Resistance to Change, and Risk-Taking sub-dimensions of the scale were 25.4 ± 4.0, 26.0 ± 4.6, and 15.4 ± 2.2, respectively. These findings support the findings of the present study. In the same study, when their innovativeness characteristics were evaluated, it was reported that nurses had skeptical characteristics. In another study conducted by Muslu [16], it was determined that nurses had questioning, pioneering, skeptical, innovative, and traditionalist structures respectively.

In other studies examining the individual innovativeness characteristics of nurses, it was reported that nurses showed the most questioning [17-22] and traditionalist [23,24] characteristics. When the results of the studies on this subject are examined, it was determined that the individual innovativeness characteristics of nurses are more questioning. It is reported that nurses who have questioning characteristics have an idea about new practices, is wary of innovations, and think about innovations for a long time before accepting innovations. Skeptic nurses, on the other hand, are skeptical and timid toward innovations and expect the majority of the group to adopt the new behavior [18].

It was determined that the Individual Innovativeness Scale total score values of the nurses participating in the study differed according to the nurses' duties in the service. It was determined that the total median score value of the Individual Innovativeness Scale of the nurses in charge of the service was higher than the service nurses. In the study conducted by Sarıköse and Türkmen [25], which supports the findings of the current study, it was stated that the job positions of nurses affect the individual innovativeness characteristics and the individual innovativeness score of executive nurses was higher.

In another study examining the factors associated with innovation in nursing, Zengin et al. [21] found that there was a significant relationship between nurses' Innovativeness Scale scores and the positions they worked in. In addition, they found that the Individual Innovativeness Scale scores of the nurses working in the polyclinic were higher than the service nurses, and there was no statistically significant difference between the nurses in charge of the service and the other nurses. Executive nurses need to support other nurses by being open and understanding to innovations, identifying the problems that nurses experience, offering solutions, providing opportunities for them to conduct scientific studies and participate in scientific congresses, and enabling nurses to recognize innovative care practices by implementing evidence-based practices [25].

It was determined that the Individual Innovativeness Scale total score values of the nurses participating in the study did not differ according to age, gender, marital status, education level, family structure, service they work, the working year, working status, working style, the state of choosing the profession willingly, the state of loving the profession, the state of being satisfied with the service, the state of choosing that service voluntarily, the status of attending professional and scientific meetings and congresses in the last year, the status of reading nursing research in the last 6 months, and the status of conducting studies after graduation. Baksi et al. [22] determined that nurses' Innovativeness Scale scores did not differ statistically significantly according to gender, marital status, education level, service they work, and working year; This result supports the findings of the current study. On the other hand, contrary to the findings of the current study, Baksi et al. [22] determined that there was a significant difference in the Individual Innovativeness Scale scores of nurses according to their state of loving their profession, participating in activities related to the nursing profession, and conducting studies on the nursing profession.

Although the findings in the literature differ, in some studies conducted on this subject, it was determined that the Individual Innovativeness Scale scores of nurses differed significantly according to gender [21, 26, 27], marital status [20], education level [27], the service they work [21], working schedule [19] , working style, conducting scientific research activities , publishing scientific articles [28], participating in scientific meetings and following professional publications .

On the other hand, in other studies on this subject, it was determined that the Individual Innovativeness Scale scores of nurses did not differ significantly according to age, gender, marital status, education level, service they work , the working year, and working style [24-28]. It is considered that these differences between the findings of the studies are related to the personality characteristics of nurses, and their status of having a corporate culture that supports innovation and enables nurses to gain innovative behavior.

As a result, supporting the individual innovativeness of nurses is extremely important in increasing the quality of nursing care, improving patient care outcomes, and reducing medical errors. In addition, it is also very essential for nurses to develop a culture of innovation and strategies in analyzing problems and producing solutions.

5. Conclusion

In this study, the mean score of the nurses on the Individual Innovativeness Scale was found to be 63.3 ± 8.7, while the mean scores of the Opinion Leadership, Resistance to Change, and Risk-Taking Sub-dimension of the scale were found to be 25.1 ± 4.5, 22.5 ± 5.0 and 15.7 ± 2.4, respectively.

When the scores of the nurses from the Individual Innovativeness Scale were evaluated, it was determined that the nurses had skeptical, questioning, traditionalist, pioneering and innovative characteristics, respectively.

In line with the findings obtained from this study, to improve the individual innovative behaviors of nurses, it is recommended to organize in-service training that will enable them to acquire innovative behaviors, support them in participating in scientific studies and congresses, provide sufficient time and resources, and to develop strategies to reduce the workload and eliminate barriers.

Conflict of interest

We have no conflicts of interest to disclose

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