Original Article

Investigation of Relationship between Entrepreneurship and Individual Innovativeness in Nurse Academicians

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Abstract

Background: There is little evidence to guide the relationship between entrepreneurship and individual innovativeness for nurse academicians, crucial to the implementation.

Objectives: This descriptive research was carry out to analyze the correlations between entrepreneurial characteristics and individual qualities of innovativeness among nurse academicians in Turkey.

Methodology: The sample of the descriptive study consisted of 216 nurse academicians. The data were collected using the "Information Form", "Entrepreneurship Scale", "Individual Innovativeness Scale".

Results: It was found a statistically weak but positive correlation between the overall entrepreneurship scale and the overall innovativeness scale. Accordingly, as the overall entrepreneurship score increased, the individual innovativeness level increased as well. In addition, statistically positive relationships between general entrepreneurship sub-dimensions such as management and organizational incentives, individual motivation, transparency and openness, individual competence, constructive business environment, innovation incentives, development and general individual innovativeness were found to be significant.

Conclusions: It was determined that individual innovativeness levels were effective in increasing entrepreneurship in nurses academicians. Also it was found there were significant relations between variables and they were effective on individual innovativeness dimensions although not entrepreneurial dimensions were all.

Key Words: nurse academicians, individual innovativeness, entrepreneurship

Introduction

When the changes that have taken place in healthcare needs today are considered, it is clear that the nursing profession needs creative, inquiring individuals who can access, produce and use sources of knowledge (White & Begun, 1998). In the last twenty years, nurses have begun to conduct their practices in accordance with an entrepreneurial model and have started to carry out interventions that have the potential of resulting in innovation (Dickerson & Nash, 1999; White, 2000). Nurses must be innovative if they are to safeguard and improve health, prevent diseases, find better ways of providing care and treatment, and gain new knowledge in their field (Herdman, 2009).

The concept of the "entrepreneur" originates from the French word "entreprendre" that was carried into English to mean "to undertake" and was first used in a scientific context by the French economist Richard Cantillon (Grebel, Pyka & Hanusch, 2003; Apuhan, 2004). Although it may be difficult to define and reach a consensus on the concepts of "personality" and

"entrepreneurship," the literature suggests that the personality traits that define entrepreneurship are the motivation to succeed and the willingness to take risks and take control (Chell, Haworth & Brearley, 1991) or elements such as the desire for innovativeness, creativity and independence (Littunen, 2000). Fundamentally, entrepreneurial nursing involves the ability to solve existing problems in nursing practices, to lead the process that evolves from the birth of an idea to the actual product, to make good use of opportunities, and to achieve product commercialization (International Council of Nurses, 2004).

The word "innovation" derives from the Latin "innovare," meaning "doing something new and different."(Yamaç, 2001). Although the notion of innovation began to be used in the academic literature much earlier, after the start of the 21st century, it has become an ever-present reality and an indispensable part of today's world (Kiziloglu & Ibrahim, 2013). The case of Florence Nightingale, the founder of modern nursing, making the discovery that the puerperal fever that women experienced after childbirth had a connection with the environment, is one of the first examples of innovation in nursing. The innovative thought that Florence Nightingale pursued saved the lives of many women (Dil, Uzun, & Aykanat, 2012). In 1999, Kambarami started to implement the "kangaroo care model" as an innovative strategy that was devised in the face of the expensive and when not applied correctly, sometimes life-threatening, use of incubators in the care of preterm infants. In this model, it was found that the skin-to-skin contact between an infant and mother when the infant is placed on the mother's chest not only helped to keep the baby's body temperature under control but also proved to be a method that could be easily adopted because it was economic, safe and socially acceptable (Kambarami, Chidede, & Kowo, 1999). Another development in the field of nursing supporting innovation was ICN's adoption in 2009 of the theme of "Innovation in Nursing Care" as a means of achieving quality care and offering communities quality services (International Council of Nurses, 2009).

An entrepreneurial and innovative approach is of vital importance to the development and progress of nurse academicians. Especially, teaching involves intense, sometimes, interactions with students, collages, and administrators. Nurse educators carry great responsibility as teaching, counselling to students, working on committees and engage in clinical practice in their organizations (Kizilci, Erdogan & Sogen, 2012). Therefore, nurse academicians are important in terms of transferring their entrepreneurial and innovative aspects to their students. A survey of the literature from the databases accessed did not reveal any papers or articles exploring the experiences of nurse academicians in the context of entrepreneurism and innovativeness. The aim of this article is to analyze the correlations between entrepreneurial characteristics and individual qualities of innovativeness among nurse academicians of different levels working at the universities.

Methodology

Design and sample

This study was designed as descriptive research based on the relational survey model. The independent variable of the study was the level of entrepreneurship; the dependent variable was the level of individual innovativeness. The universe of the study comprised the nurse academicians (N=432) working in the undergraduate nursing programs of 11 universities in the Aegean region. The study sample constituted nurse academicians (n=216) who volunteered to participate in the research.

Sampling and data collection

The participants of this study included nurse academicians working in nursing schools of 11 different universities in the Aegean region in Turkey. The permission of each university and the written consent of the participants were obtained before data collection. The population of the study consisted of the 432 nurse academicians College of Nursing in the academic year 2017-2018. The formula $[n=(Nx2xpxq)/(d2x(N-1)+t2xpxq)]$ was used to calculate the size of the sample over the population (Buyukozturk, 2010). The calculation showed that the appropriate sample size would be minimum 204 nurse academicians (Karatas, 2004). In total, 216 completed questionnaires were collected and judged as appropriate for the analysis. An information form devised by the researchers in line with the literature was used to inquire into the participants' descriptive characteristics. This questionnaire consisted of statements designed to establish the participants' demographic features, including such features as age, gender, educational status and professional experience. Additionally, the researchers visited

each unit to distribute the questionnaires, as well as to explain the purpose and method of the study, entrepreneurship and individual innovativeness scales were used. Data were collected in face-to-face interviews over the period February 2017 - December 2017. Correspondence author; Ege University, Ebiltem Technology Transfer Office and the Faculty of Economics and Administrative Sciences in cooperation with the "Entrepreneurship Certificate Program" document was received, in 2015.

Instruments

Entrepreneurship Scale (ES) developed by Jarna and Kaisu in 2005, this scale was tested for validity and reliability in the Turkish language by Mehmet Kiziloglu. Permission was obtained from the author in writing for the use of the Turkish version of the scale. The scale is made up of seven subscales (management and organizational encouragement, individual motivation, transparency and openness, individual competence, constructive working environment, innovation incentives, development). The responses given to the statements on the scale are expressed as: I absolutely disagree, 1 point; I disagree, 2 points; I'm undecided, 3 points; I agree, 4 points; I absolutely agree, 5 points. (Kiziloglu & Ibrahim, 2013).

Individual Innovativeness Scale (IIS) developed by Hurt et al. in 1977, this scale was studied for validity and reliability for nurses by Sarioglu Kemer in 2017. Permission was obtained from the author in writing for the use of the Turkish version of the scale. The scale is comprised of 3 subscales (opinion leadership, resistance to change, risk-taking). Categories were determined from the total score obtained from the Individual Innovativeness Scale (IIS) such that a score of 82 and above was considered "Innovative," the score range 75-82 designated "Leaders," scores of 66-74 were defined as "Inquiring," 58-65 as "Skeptical" and scores of 57 and below were defined as "Traditional." (Sarioglu, 2017) (Figure 1)

Scale	Factors	No. of Expressions	Cronbach's Alpha (α)
Entrepreneurship Scale	7	28	0.933
Individual Innovativeness Scale	3	18	0.895

Figure 1. Reliability analysis

Data analysis

The data collected in the research were analyzed using the SPSS (Statistical Package for Social Sciences) for Windows 22.0 program. Descriptive statistics (numbers, percentages, means, standard deviation) were used in the analysis of the data. The comparison of quantitative data was carried out by exploring the relationship between the dependent and independent variables in the study using the Spearman/Pearson correlation methods and testing for effect using regression analysis. In simple linear regression analysis, standardized regression coefficients are equal to the Pearson

correlation coefficient and explained variance equals the coefficient of determination (R2) (Buyukozturk, 2010). The correlations between the scales were evaluated on the basis of the following criteria: r in the interval (0.00-0.25) points to a "very weak" correlation, r in the (0.26-0.49) interval represents a "weak" correlation, r in the (0.50-0.69) interval is a "moderate," r in the (0.70-0.89) interval is a "strong" correlation and r in the (0.90-1.00) interval represents a "very strong" correlation." (Kalayci, 2006). The findings were assessed at the 5% significance level in the 95% confidence interval.

Ethical considerations

Ethical Considerations: This study was conducted after receiving approval (92112210-050.05.04) from the Scientific Research and Publications Ethics Committee of the institution to which the researcher belongs. The written consent of the universities concerned was also received. The research was conducted in compliance with ethical principles, the questionnaire being administered after the consent of the nurse academicians had been obtained. Participants' anonymity was guaranteed and they were assured that the data would be used for research purposes only.

Limitations of the Study

Findings obtained in the research are limited within the timeframe applied and within the framework of the sampling of the data (consisting of higher education institutions providing nursing undergraduate education in Aegean Region). Another limitation of the research consists of a limited number of employees, which is based on the questionnaire collected.

Results

The descriptive characteristics of the academician nurses participating in the research are given in Table 1. 216 academician nurses participated in the study between the dates specified. Of the participating academics, 54.6% were of the ages 23-33, 97.2% were women and 48.6% had earned their doctorates. Of the academics, 21.3% worked in the Fundamentals of Nursing Department. Among them, 59.3% were research assistants. 65.3% among the academician nurses, have 1-10 years professional experience (Table-1).

A statistically weak but positive significant correlation was found between the overall entrepreneurship scale and the overall innovativeness scale ($r=0.272$; $p=0.000<0.05$). Accordingly, as the overall entrepreneurship score increased, the individual innovativeness level increased as well. Moreover, statistically significant and positive correlations were found between the management and organizational encouragement, individual motivation, transparency and openness, individual competence, constructive working environment, innovation incentives, and development subscales of the overall entrepreneurship scale (respectively, $r =0,280$; $r= 0,148$; $r= 0,224$; $r=0,215$; $r=0,171$; $r =0,233$; $r= 0,304$; $r=0,272$; $p<0.05$) (Table-2).

The regression analysis carried out in order to determine the correlation between the overall individual innovativeness level and the overall entrepreneurship level revealed statistical significance ($F=18.561$; $p=0.000<0.05$). A weak correlation was observed between the innovativeness level and the entrepreneurship variables as predictors and explanatory power was low ($R2=0.080$). The overall level of entrepreneurial behavior among nurse academicians increases the level of individual innovativeness ($ß=3.181$). (Table-3.1)

In the first step, the impact of the dimensions of entrepreneurship on opinion leadership was explored and the results reached are presented in Table-3.2. As can be seen, the dimensions of entrepreneurship are predictors of opinion leadership and explain 21.8% of the variance ($F=8.283$; $p=0.000$). Management and organizational encouragement, innovation incentives, levels of development were factors that increased the level of opinion leadership among nurse academicians ($ß=0.195$; $ß=0.189$; $ß=0.280$, respectively). According to the standardized regression coefficient (Beta), the impact of the independent variables on opinion leadership was, in order of relative importance, development, followed by management and organizational encouragement and innovation incentives. The individual motivation levels of the nurse academicians brought down the opinion leadership level ($ß=0.268$). However, the predictive power of transparency and openness, individual competence, a constructive working environment did not prove to be significant. (Table-3.2)

In the second step, the impact of the dimensions of entrepreneurship on resistance to change was explored and the results reached are presented in

Table-3.2. As can be seen, the dimensions of entrepreneurship are predictors of resistance to change and explain 0.8% of the variance (F=2.579; p=0.014). The management and organizational encouragement level of nurse academicians increases the level of resistance to change (ß=0.321). The individual motivation levels of the nurse academicians brought down the resistance to change level (ß=0.249). (Table-3.2)

In the third step, the impact of the dimensions of entrepreneurship on taking risks was explored and the results reached are presented in Table-3.2. As can be seen, the dimensions of entrepreneurship are predictors of risk-taking and explain 21% of the variance (F=8.037; p=0.000). The innovation incentives and development levels of the nurse academicians increased risk-taking levels (ß=0.241; ß=0.252). Development constitutes the largest impact on risk-taking, following by innovation incentives. The individual motivation levels of the nurse academicians brought down resistance to change levels (ß=0.177). (Table-3.2)

Table 1. Demographic Characteristics of Nurses Academicians Participating in the Research (N=216)

Characteristics	n	%	Department	n	%
Age Groups (years)			Fundamentals of Nursing	46	21,3
23-33	118	54,6	Internal Medicine Nursing	27	12,5
34-44	56	25,9	Surgical Nursing	24	11,1
45-55	33	15,3	Obstetric and Gynecology Nursing	28	13,0
56-66	9	4,2	Pediatric Nursing	31	14,4
Total	216	100,0	Psychiatric Nursing	21	9,7
Gender	n	%	Public Health Nursing	27	12,5
Female	210	97,2	Teaching in Nursing	5	2,3
Male	6	2,8	Management in Nursing	7	3,2
Total	216	100,0	Total	216	100,0
Educational Level	n	%	Academic Title	n	%
Bachelor	18	8.3	Research Assistant	128	59,3
Master	93	43.1	Instructor	26	12.0
PhD	105	48.6	Assistant Professor	33	15.3
Total	216	100.0	Associate Professor	14	6.5
Working Time	n	%	Professor	15	6.9
1-10 years	141	65.3	Total	216	100.0
11-20 years	53	24.5			
20 years and over	22	10.2			
Total	216	100.0			

Table 2. Analysis of the Relationship Between Entrepreneurship and Individual Innovativeness Levels of Nurses Academicians Staff Participating in the Research (n = 216)

		Opinion Leadership		Resistance to Change		Risk Taking		Overall Individual Innovativeness Scale
Management and Organizational Encouragement	r	0.279**	r	0.112	r	0.300**	r	0.280**
	p	0.000	p	0.100	p	0.000	p	0.000
Individual Motivation	r	0.194**	r	-0.25	r	0.179**	r	0.148**
	p	0.004	p	0.717	p	0.008	p	0.030
Transparency and Openness	r	0.285**	r	0.26	r	0.264**	r	0.224**
	p	0.000	p	0.708	p	0.000	p	0.001
Individual Competence	r	0.231**	r	0.56	r	0.281**	r	0.215**
	p	0.001	p	0.411	p	0.000	p	0.002
Constructive Working Environment	r	0.193**	r	0.005	r	0.231**	r	0.171**
	p	0.005	p	0.940	p	0.001	p	0.012
Innovation Incentives	r	0.293**	r	-0.018	r	0.330**	r	0.233**
	p	0.000	p	0.797	p	0.000	p	0.001
Development	r	0.336**	r	0.115	r	0.318**	r	0.304**
	p	0.000	p	0.092	p	0.000	p	0.000
Overall Entrepreneurship Scale	r	0.307**	r	0.061	r	0.306**	r	0.272**
	p	0.000	p	0.372	P	0.000	p	0.000

Table-3. Examination of the Effect of Entrepreneurship Levels of Individual Nurses Academicians on Individual Innovativeness by Regression Analysis

Table-3.1: The Impact of Nurses Academicians on Overall Individual Innovationeness Level of General Entrepreneurship Levels

Dependent Variable	Independent Variable	ß	t	p	F	Model (p)	R^2
Overall Individual Innovativeness Level	Constant	3.181	17.551	0.000	18.561	0.000	0.08
	Overall Entrepreneurship Scale	0.283	4.308	0.000			

Table-3.2: Opinion Leadership. Resistance to Change and Risk Taking Results of Multiple Regression Analysis

Dependent Variable	Independent Variable	ß	t	p	F	Model (p)	R^2
Opinion Leadership	Constant	2.249	9.620	0.000	8.283	0.000	0.218
	Management and Organizational Encouragement	0.195	2.097	0.037			
	Individual Motivation	-0.268	-2.697	0.008			
	Transparency and Openness	0.111	1.049	0.296			
	Individual Competence	-0.032	-.354	0.724			
	Constructive Working Environment	-0.002	-.022	0.982			
	Innovation Incentives	0.189	2.221	0.027			
	Development	0.280	3.414	0.001			
Resistance to Change	Constant	3.383	14.855	0.000	2.579	0.014	0.08
	Management and Organizational Encouragement	0.321	3.185	0.002			
	Individual Motivation	-0.249	-2.304	0.022			
	Transparency and Openness	-0.127	-1.109	0.269			
	Individual Competence	0.055	0.550	0.583			
	Constructive Working Environment	-0.003	-0.030	0.976			
	Innovation Incentives	-0.028	-0.306	0.760			
	Development	0.174	1.952	0.052			
Risk Taking	Constant	2.623	11.178	0.000	8.037	0.000	0.213
	Management and Organizational Encouragement	0.138	1.475	0.142			
	Individual Motivation	-0.251	-2.517	0.013			
	Transparency and Openness	0.020	0.191	0.848			
	Individual Competence	0.078	0.842	0.401			
	Constructive Working Environment	0.008	0.087	0.931			
	Innovation Incentives	0.241	2.825	0.005			
	Development	0.252	3.054	0.003			

Table-3.3: The Impact of Entrepreneurship Levels of Nurses Academicians on Overall Individual Innovativeness Level

Dependent Variable	Independent Variable	ß	t	p	F	Model (p)	R^2
Overall Individual Innovativeness Scale	Constant	2.773	14.357	0.000	7.027	0.000	0.191
	Management and Organizational Encouragement	0.269	2.846	0.005			
	Individual Motivation	-0.304	-3.006	0.003			
	Transparency and Openness	0.004	0.037	0.971			
	Individual Competence	0.029	0.313	0.755			
	Constructive Working Environment	0.000	-0.001	1.000			
	Innovation Incentives	0.144	1.668	0.097			
	Development	0.278	3.326	0.001			

The effect of the nurse academicians' entrepreneurship scores on their overall individual innovativeness characteristics is shown in Table-3.3 The regression analysis carried out to determine the correlation between overall individual innovativeness and management and organizational encouragement, individual motivation, transparency and openness, individual competence, constructive working environment, innovation incentives revealed statistical significance (F=7.027; p=0.000<0.05). A very weak correlation or explanatory power was observed between the overall individual innovativeness level and its predictors, management and organizational encouragement, individual motivation, transparency and openness, individual competence, constructive work environment, innovation incentives and development (R2=0.191). The management and organizational encouragement level of nurse academicians increases the level of individual innovativeness (ß=0.269). The overall level of development among nurse academicians increases the level of individual innovativeness (ß=0.278). The most pronounced effect increasing overall individual innovativeness is development, followed by management and organizational encouragement. The individual motivation levels of the nurse academicians brings down the level of overall individual innovativeness (ß=0.174). (Table-3.3)

Discussion

The findings from this study indicate that there are significant correlations between entrepreneurship and individual innovativeness variables and that while not all of the dimensions of entrepreneurship have an impact, there are significant influences on the dimensions of individual innovativeness. In other words, the seven sub-dimensions of entrepreneurship account for 19% of the total variance in the characteristic of innovativeness.

It has been reported that entrepreneurial skills directly influence the development of innovativeness (Demirel & Ozbezek, 2015). An examination of the test results related to the significance of the regression coefficients shows that the individual motivation, management and organizational encouragement and development variables are significant predictors of innovativeness. In other words, while the entrepreneurship dimensions of management and organizational encouragement and development levels have an intensifying effect on innovativeness, the level of individual motivation has a detractive influence.

The mean scores of the nurse academics participating in the study in terms of overall individual innovativeness and its sub-factors, opinion leadership, resistance to change and risk-taking, were at moderate and high levels. It was

determined that innovativeness among the participants was at a good level. The results of the study indicate that the participants' mean scores in individual innovativeness was 71.09+ 8.61 on the basis of 90. Of the participants, 9.7% appeared to be in the category of Innovative, 24.1% in the category of Leader, 45.8% were Inquirers, 13.9% were in the Skeptical and 6.5% in the Traditional categories. This distribution is consistent with the findings in the literature (Sarioglu, 2017; Hurt, Joseph & Cook, 1977; Kilicer & Odabasi 2010). A high level of innovativeness among nurse academicians is a desired aspect of competence and may contribute to distinguishing the achievements nurses attain.

Risk-taking is a prerequisite of innovativeness (Kalkan, Odaci & Koc, 2010). The Canadian Nurses Association emphasizes that in order to improve on the quality of care, a nurse must possess the basic leadership qualities of acting as an advocate, a cooperative team member, exhibiting skills of good communication and risk-taking, acting as a consultant and guide, as well as being a role model and visionary (Duygulu & Kublay, 2008). In our study, the sub-dimensions of entrepreneurship predicted risk-taking levels and explained 21% of the variance. Similarly, in the study by Basim et al., a high level of correlation was found between innovativeness and risk-taking (r=0.68) (Basim, Korkmazyurek & Tokat, 2008). In this study, it was determined that nurses displayed a good level of innovativeness and risk-taking behavior and that these behaviors had a positive influence on each other. In the study by Taskin et al., it was observed that there was a positive and strong correlation between the mean scores for the innovativeness qualities of head nurses (n=48) and their risk-taking behaviour (Taskin, Tiryaki & Demirkaya, 2014). It is important that nurse academicians adopt innovative qualities and venture to take risks in terms of their efforts to improve their personal and professional competence and become empowered.

According to the correlation analysis in the study, it was found that as levels of transparency and openness, individual competence, constructive working environment and innovation incentives increase, the level of individual innovativeness also increases. The regression analysis however showed that levels of transparency and openness, individual competence, constructive working environment and innovation incentives had no direct impact as predictors of individual innovativeness. Similar to our study, Kiziloglu and Ibrahimoglu showed (n=105) that the subscales of transparency and openness, individual competence and development did not have a direct influence on predicting the level of innovativeness (Kiziloglu & Ibrahim, 2013). In contrast, Kiziloglu found that the subscale of "Innovation incentive" did affect the level of innovativeness. This result might have been influenced by the fact that Kiziloglu's study was carried out with a sample group of companies registered with the Chambers of Industry and Commerce that had won awards in the field of innovation in 2010. In our own study, the lack of motivation nurse academicians displayed with regard to being encouraged to embrace innovativeness may have been a result of the fact that the concept of an innovative organizational culture has not been fully established.

Conclusion

As there is little evidence found in the current literature to guide the relationship between entrepreneurship and individual innovativeness for nurse educationalists the present study adds to this body of knowledge. It was determined that individual innovativeness levels were effective in increasing entrepreneurship in nurse academicians. Nurse academicians should be encouraged and guided in entrepreneurship and innovativeness. The quality of nursing care should be improved in line with advancing technologies and achieving this should be accepted as one of the important responsibilities of nurse academics. More attention through frequent scientific meetings and congresses is being focused in recent years on entrepreneurship and innovativeness. Ensuring that nurse academics contribute to innovation is dependent upon the extent that organizations support innovative thinking, provide employees with the opportunity to develop new ideas, and encourage them to look beyond their own limits. Challenging innovation processes require strong nurse academics-leaders who risk taking, engage with entrepreneurship innovation process using a entrepreneurship thinking approach. The results of present study point to the need for more research on the relationship between entrepreneurship and individual innovativeness in the nursing profession as well as in other occupations as this will provide a beneficial framework for further applications in this context.

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