Adaptation of The Individual Innovativeness Scale in Nursing Profesion: Turkish Validity - Reliability Study*

Bireysel Yenilikçilik Ölçeği'nin Hemşireliğe Uyarlanması: Türkçe Geçerlik - Güvenirlik Çalışması

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ABSTRACT

Aim: The research was methodologically carried out with the purpose of adapting the Individual Innovation Scale to Turkish and testing its validity and reliability.

Methods: The research comprised 273 nurses between January 2013 and January 2014 at three hospitals in Erzurum, Turkey. The Individual Innovativeness Scale was used as a data collection tool. While the data were evaluated, group translation and translation-back translation method were applied within the scope of language validity. The Content Validity Index was used for the validity of the scope by consulting expert opinion. Explanatory factor analysis was done for structure validity. The Kaiser-Mayer Olkin and Bartlett test, Basic Component Analysis and Varimax Rotation were used for exploratory factor analysis. For reliability analysis, Cronbach Alpha, item-total correlation tests and test-retest were conducted, and 27% lower and upper quartiles were tested for item discrimination.

Results: The Turkish version of the Individual Innovativeness Scale is composed of 18 items and 3 sub-scales. Item total score correlation values of the scale are between .41 and .62, factor loads are between .49 and .75 and the result of test -retest is statistically significant. Cronbach alpha of the scale was found to be .82 in total and between .72 and .80 in sub-scales.

Conclusion: As a result of the study, it was determined that the Individual Innovation Scale applied to nursing is a valid and reliable evaluation instrument.

Keywords: *Individual innovation; nursing; validity and reliability.*

ÖZ

Amaç: Bu araştırma, Bireysel Yenilikçilik Ölçeği'ni Türkçe'ye uyarlamak ve hemşirelikte geçerlilik ve güvenilirliğini test etmek amacıyla metodolojik olarak gerçekleştirilmiştir.

Yöntem: Araştırma, Erzurum ilindeki üç hastanede Ocak 2013- Ocak 2014 arasında 273 hemşire ile gerçekleştirilmiştir. Veri toplama aracı olarak Bireysel Yenilikçilik Ölçeği kullanılmıştır. Veriler değerlendirilirken dil geçerliği kapsamında grup çevirisi ve geri çeviri teknikleri uygulanmıştır. Kapsam geçerliği için uzman görüşü alınarak Kapsam Geçerlik İndeksi kullanılmıştır. Yapı geçerliği için açıklayıcı faktör analizi yapılmıştır. Açıklayıcı faktör analizi için Kaiser-Mayer-Olkin ve Bartlett testi, Temel Bileşenler Analizi ve Varimax Rotation kullanılmıştır. Güvenilirlik analizi için ise Cronbach Alpha, madde-toplam korelasyon testleri ve test-tekrar test yapılmış, madde ayırt edicilik işlemleri için %27'lik alt ve üst çeyreklikler test edilmiştir.

Bulgular: Bireysel Yenilikçilik Ölçeğinin Türkçe versiyonu 18 madde ve 3 alt boyuttan oluşmaktadır. Ölçeğin madde toplam puan korelasyon değerleri .41 ile .62 arasında iken, faktör yükleri .49 ile .75 arasındadır ve test-tekrar sonuçları istatistik olarak önemlidir. Ölçeğin Cronbach alfa değeri toplamda .82, alt boyutlarda ise .72 ve .80 arasında belirlenmiştir.

Sonuç: Araştırma sonucunda hemşireliğe uyarlanan Bireysel Yenilikçilik Ölçeği'nin geçerli ve güvenilir bir ölçme aracı olduğu saptanmıştır.

Anahtar kelimeler: *Bireysel yenilikçilik; hemşirelik; geçerlik ve güvenirlik.*

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In the changing world, the most important characteristic that all sectors and organizations need and require in individuals is innovativeness. The word innovation is derived from Latin root "innovare" and means "doing something new and different,"[1] whereas it is defined as "the realization of a new or considerably improved product(good or service) or process, a new marketing method, or a new organizational method in internal applications, workplace organization, or external affairs" in the Oslo Guide prepared by the Organization of Economic Cooperation and Development(OECD) and the European Commission.[2]

The concept of innovation was first mentioned by Peter Drucker and Drucker (2007) defined innovation as "the action of making resources capable of making novelties" in his book "Innovation and Entrepreneurship". Discovery of fire, invention of wheel, Renaissance etc. are the first examples that come to mind regarding innovation.[3]

The concept of innovation is confused with concepts such as creativity, change, invention, entrepreneurship, and technology, which are closely related to each other and of complementary character but do not have the same meaning and it is used as a substitute to those concepts,[4] However, every change, invention, novelty, technology etc. are not innovation[5], In order to transform into innovation, those must be put into practice, applicable in social area, adopted by the society, and the efficiency to be obtained must increase with the benefit to be.[5-7] Although innovation certainly includes novelty, it provides benefit and in the end creates value differently from novelty.[8]

Innovation provides the fulfillment of individual and social needs (health, recreation, working, transportation etc.) at a better level.[9] Important developments are realized in healthcare, education, and transportation etc. services provided to individuals thanks to innovation and quality of life of individuals increase.

Today, innovation shapes the future and has strategic importance for organizations in increasing their ability of competition, enabling sustainable growth, and creation of new products and services.[10] Increasing competition and shortening product/service life drive countries and organizations towards innovation. Organizations are now trying to leave conventional thoughts on management aside and develop individual skills of "innovation" that bring about benefit, effectiveness, and efficiency.[11]

Individual innovativeness is the "perception of any product, service, or idea as new by a person".[12] Hirschman[13] stated that all individuals are innovative to some extent and adopt the things and ideas they consider as new during their lives. Individual innovativeness is considered as a discipline, learning skill, and practice skill. Having sufficient level of education, being experienced in the related fields, having the skill of creative thinking, adopting the problem, and being motivated for its solution are considered as the prerequisites of individual innovativeness.[12] Individual innovativeness is considered to be an umbrella concept that includes the characteristics of concepts such as taking risk, being open to experience, and opinion leadership.[14]

Health services are among the fields in which innovativeness is experienced most intensively. Causes such as change in the structure of population, increase and changes in types of diseases, diseases becoming chronic, and increase in society's expectations etc. give rise to new needs in healthcare system and inevitable changes occur due to these needs.[15] The most important healthcare worker who nurses apply these changes to the individual/family and society he/she provides service for and deliver innovations to the society. Innovation towards nursing can be defined as a process in which new approaches, technologies, and working methods are developed in healthcare services and new ideas(method, type of service etc.) are transformed into outputs that create value.[16]

Florence Nightingale emphasized the necessity and inevitability of change by saying "We must change the life rather than adapting to it" in 1800s.[16] This thought of Florence Nightingale is considered as the first case in which the existence of innovation is realized in nursing.

ICN's designation of its theme as "Innovation in Nursing Care" in 2009 indicates the importance of innovation in the field of nursing across the world. According to this theme, innovation has an important role in finding new information/methods/services for supporting health in nursing practices, prevention of diseases, definition and prevention of risk factors, increasing behaviors that improve health, and providing higher quality care.[16,17] Nurses are responsible for constantly questioning the service they provide in order to see whether it is performed well or not and investigating the ways by which service can be provided more efficiently, with higher quality, and cost-efficiently. In order for nurses to fulfill this responsibility, they must be innovative, initiate and sustain innovation. In healthcare institutions, nurses are expected to create an innovative perspective and field of practice, raise the necessary awareness for innovation, create a working atmosphere that promotes innovation, support the nurses with innovative attempts and ideas, reward those who are successful, create projects, and lead the members of other professions in terms of innovation.[16,18] However, in order to be able to achieve these, nurses need to be individually innovative.

In the literature, there is a scale developed in order to determine whether individuals are innovative or not in general.[14] Whether this scale can be used as a valid and reliable scale in the determination of the innovativeness of nurses is unknown. Due to this need, by the adaptation of this scale into Turkish, the identification of whether this scale can be used as a valid and reliable scale in the determination of innovativeness of

nurses and providing a new scale that can be used by nurses and researchers for the literature were aimed at.

Methods

Study Design

This methodologically study was carried out by the adaptation of Individual Innovativeness Scale(IIS) into Turkish in order to test the validity and reliability of it in nursing.

Data Collection Instruments

"Personal Information Form" which includes questions about the personal and professional characteristics (age, sex, position unit, educational status etc.) of the nurses and "Individual Innovativeness Scale" which is valid in terms of language and content were used as the data collection tool in the research. The scale was developed by H. Thomas Hurt, Katherine Joseph and Chester D. Cook in 1977.

Original form of IIS consists of 20 items to be answered in 5 likert type (strongly disagree: 1, disagree: 2, neutral: 3, agree: 4, strongly disagree: 5). Scale consists of one dimension. 12 of the scale items are positive (items 1, 2, 3, 5, 8, 9, 11, 12, 14, 16, 18 and 19) whereas 8 are negative (items 4, 6, 7, 10, 13, 15, 17 and 20). As examples of positive items "1-*My peers often ask me for advice or information*, 2-*I enjoy trying new ideas*, 3- *I seek out new ways to do things. As examples of negative items* "4-*I am generally cautious about accepting new ideas*, 6- *I am suspicious of new inventions and new ways of thinking.* The scale is evaluated based on total score. The individual innovativeness score is calculated by adding 42 points to the score obtained by subtracting the negative items from the total positive score. The lowest and the highest scores that can be obtained from the scale are 14 and 94 respectively. Cronbach α reliability coefficient of the scale is determined as 0.89.[14,27] According to the scores calculated based on the scale, individuals who score above 80 are considered "Innovators," between 69-80 are "Early Adopters", between 57-68 are "Early Majority", between 46-56 are "Late Majority", and below 46 are "Laggards".[14]

Setting and Sample

This methodologically conducted study was completed in 3 steps.

- Language and content validity
- Pilot testing and test-retest
- Psychometric testing

Phase I. Language validity

In order to provide language equivalency and cultural equality of the original scale, translation-back translation method, which is the most commonly preferred method in the world, was used.[19] The scale was translated from English into Turkish by 3 linguists separately. Each linguist's translation was examined and a Turkish form was created, and this form was translated from Turkish into English by 3 different academics who know both languages. The English translation was compared to the original form of the scale and observed to match with the original form of the scale.

Content validity

In order to provide scope equivalency of the scale, language equivalency of which was guaranteed, opinions of a group of experts composed of 12 people who are experts on management science was appealed. The experts were informed about the study and they evaluated the clarity of the items in the scale in terms of both English and Turkish languages, whether the items are related to the concept to be measured, and its cultural conformity. Content Validity Index (CVI)[19] and Davis Method[20] were used in the collection of expert opinions. According to this method, a scoring between 1-4 (1-Not appropriate, 2-Item needs to be made appropriate, 3-Appropriate but changes are required, 4-Very appropriate) was applied for each item. As a result of the opinions obtained, CVI of the entire scale was found to be 0.91. Criterion value for CVI is accepted to be 0.08.[21,22] According to these results, scope validity of IIS has been provided.

Phase II. Pilot testing

The scale, language and scope validity of which has been provided, was applied in pilot form to 30 nurses who were not taken into the scope of research. Following this application, required amendments were made in line with the feedback taken from nurses and items took their final form.

Test-retest

The scale was applied to 74 nurses two times with a 15-day interval in between in order to test its invariance by time.[21,23] As a result of Pearson Moments Product Correlation analysis, a medium-level, positive and highly significant relation between the two applications was determined (r=0.60, p=.000).

Phase III. Psychometric testing

Sample

Psychometric assessments of the scale were made on nurses working at a university hospital that provides general diagnosis-treatment and care services in Erzurum centrum and two hospitals of the Ministry of Health. In the research, sampling selection method was not used and all nurses (n=1235) working at these hospitals were targeted to be reached; however, only 273 nurses were taken into the scope of the study due to reasons such as being off duty, on sick leave, denial of participating in the research, not filling out the data collection

instrument completely etc. In the literature, sample size is defined as required to be between 5-10 times of the number of scale items.[21,23] In this research, 14 times of the number of items for the 20-item IIS has been reached.

Data collection

Psychometric assessments of the scale were collected between September 1, 2013 - October 4, 2013. All nurses were tried to be reached within this period, 350 of them participated in the research yet data of 273 nurses was taken into assessment. Answering rate of data collection instrument is 78%.

Data analysis

Data was assessed in computer environment in SPSS for Windows 18.00 statistical package program by a statistics expert. Barlett, Kaiser-Mayer-Olkin (KMO) tests, Explanatory Factor Analysis, Basic Components Analysis, Scree Plot Test, Varimax Orthogonal Rotation tests were used for structural validity in the assessment of data. In reliability analysis, Cronbach Alpha Coefficient and Item Total Score Correlation were used. Percentage and frequency distribution was used in the definition of the characteristics of research group whereas t Test, Kolmogorov Smirnov Test, and 27% Sub- and Upper-Groups Average Test were used in the determination of scale scoring.

Ethical consideration

Original form of the scale which is in English language is available at the web address.[24] Here it is stated that the scale can be used without permission and making any payment. However, permission was obtained from the administrator (Lynda L. McCroskey) of the web page where the scale is published via e-mail prior to the initiation of this study.

Prior to data collection for the research, approval from ethics committee and official written permits from the institutions that are taken within the scope of research were obtained. At data collection stage, nurses were interviewed face to face and provided with information on the research, and it was emphasized that the information collected will be kept confidential and used only for scientific purposes. Only the nurses who wanted to participate in research voluntarily were taken into the scope of the study.

Results

Demographic Characteristics

It has been determined that 60% of the nurses who participated in the research are working at hospitals of the Ministry of Health, 93.4% are working as service nurse and 34.8% are working at medical units, 72.9% have been working as a nurse for 1-5 years and are at the age of 26 on average, 83.9% are female, 59.3% are single, and 50.5% have bachelor's degree.

Reliability Results

In the testing of the reliability of IIS, amended item total score correlations of the items of the scale were evaluated in the first place and amended item total score correlation values were found to be between -.22 and .52. It was found that correlation of item 4 of the scale was negative whereas that of item 14 is too low. For this reason, items 4 and 14 were removed from the scale and amended item total score correlation values were calculated again based on the remaining 18 items. Item-total score correlation values of the remaining 18 items in the scale were found to be between .29 and .56 (Table 1).

Table 1. Item-Total Score Correlation Values of the Remaining 18 Items and Cronbach Alpha Coefficients

Items	Mean	SD	The amended item total score correlations of the items of the scale	Cronbach Alpha coefficients
1	3.37	.87	.39	.82
2	4.15	.68	.53	.81
3	4.01	.69	.56	.81
5	3.73	.73	.39	.82
6	3.35	1.01	.30	.82
7	3.49	1.01	.45	.81
8	3.41	.83	.36	.82
9	3.69	.82	.39	.82
10	3.96	.99	.43	.82
11	3.73	.78	.51	.81
12	3.48	1.00	.51	.81
13	3.53	.98	.49	.81
15	3.75	1.02	.35	.82
16	3.94	.75	.43	.82
17	2.78	1.04	.29	.82
18	4.33	.66	.47	.82
19	3.91	.78	.41	.82
20	3.43	1.07	.40	.82
Of the Scale	**Arithmetic average**	**Variance**	**Cronbach Alpha**	**Ranj**
	66.13	65.51	.82	51

Then, in order to determine the impact of each item of IIS on the total score of the scale, item total score correlation values were calculated. It has been identified that correlation values

are between .41 and .62 and all are significant at p<0.01 importance level (Table 2). Cronbach Alpha values of the scale were calculated in total and in sub-scale in order to determine internal consistency of the scale. Total Cronbach Alpha value of the scale is determined to be .82, whereas 0.80 for opinion leadership sub-scale, 0.78 for resistance to change sub-scale, and 0.72 for risk taking sub-scale.

Table 2. Item-Total Score Correlation Values of Individual Innovativeness Scale

	r	p		r	p
Item 1	.48	.000*	Item11	.58	.000*
Item2	.59	.000*	Item12	.60	.000*
Item3	.62	.000*	Item13	.58	.000*
Item5	.46	.000*	Item15	.46	.000*
Item6	.41	.000*	Item16	.50	.000*
Item7	.55	.000*	Item17	.41	.000*
Item8	.45	.000*	Item18	.53	.000*
Item9	.47	.000*	Item19	.48	.000*
Item10	.52	.000*	Item20	.51	.000*

* p<0.001

Validity Results

In order to test structural validity of the 18 item scale, KMO and Barlett test, Scree Plot test, basic components method as explanatory factor analysis, and varimax orthogonal rotation method was applied. KMO coefficient was determined to be .86 whereas Bartlett test result was determined to be significant at p<0.05 importance level. However, after varimax orthogonal rotation method, items were observed to fail providing logical integrity and scale items were re-evaluated for a 3-factor structure. As a result of the second factor analysis, a 3-factor structure that explains 49% of the total variance and eigenvalue of which is above 1.00 emerged (Table 3).

In consideration of each factor, it has been determined that eigenvalue of the first and the most important factor regarding the quality measured by the scale is 3.39 and the variance it explains is %18.87, eigenvalue of the second factor is 3.17 and the variance it explains is %17.66, eigenvalue of the third factor is 2.30 and the variance it explains is %12.8. Factor loads of items were determined to be between .50- .75 for Factor 1, between .59- . 70 for Factor 2, and between .49- .71 for Factor 3 (Table 3).

Factors that emerged as a result of factor analysis were named as "Opinion leadership", "Resistance to change", and "Risk taking" in consideration of the meaning integrity of items. It has been determined that there are 7 items (items 1,3,5,8,9, 11 and 12) in opinion leadership sub-scale, 7 items (items 6,7,10,13,15,17 and 20) in resistance to change sub-scale, and 4 items(items 2,16,18 and 19) in risk taking sub-scale (Table 3).

In order to determine whether the scores obtained from the scale have normal distribution or not, Kolmogorov- Smirnov test was conducted and the results of the analysis indicated that participants' scores calculated in the scale were not different from the normal distribution (Z=1.137, p= .150). According to the total scores obtained from the scale, innovativeness category distributions were determined based on the innovativeness category distributions stated by Rogers[4] that comprise the basis of the adapted scale.

Following all analysis, scale adapted into Turkish was scored in the categories related to innovativeness. According to this, the ones above two standard deviations from the mean (over 82 points) were categorized as "Innovative", the ones between above two standard deviations and above one standard deviation (75-82 points) as "Pioneer", the ones between one standard deviation and the mean (66-74 points) as "Interrogator", the ones between the mean and minus one standard deviation (58-65 points) as "Skeptical", and finally the ones below minus one standard deviation (57 points and below) as "Traditional".

In order to test the coherence between the category to which each participant belongs according to the scoring stated in the original scale and the category to which he/she belongs according to the arithmetic mean and standard deviation obtained from this study, Pearson product moment correlation analysis was applied. According to this, it was observed that there is a positive and significant relation between the two designated categories at a high level (r=0.871, p=.000).

In order to determine the sufficiency of the Turkish form of IIS in distinguishing persons in terms of the characteristic it measures, item analysis based on the difference of the sub- 27% and upper 27% group averages determined based on the total score in the original scale was applied. For this analysis, scores of nurses obtained from IIS on individual innovativeness were listed from the highest to the lowest and upper 27% and lower 27% groups were formed. Then the upper 27% group was considered to be highly innovative whereas the lower 27% group as less innovative. As a result of t test, in all items, differences between 27% upper group and 27% lower group in terms of score averages were observed to be extremely significant (p= 0.000).

Discussion

Literature observation has indicated that there is no instrument that is developed for nurses or can be used for the determination of the level of innovativeness of nurses. This means that there is a need for a measurement instrument that can be used to measure individual innovativeness status of nurses. Motivated by such need, validity and reliability testing of ISS developed in another culture and sampling group was aimed at in order to use in Turkish culture and nurses.

Table 3. Distribution of Individual Innovativeness Scale Items According to Factors and Factor Loads

SUB-SCALES	ITEMS	FACTOR LOADS		
		1	2	3
OPİNİON LEADERSHİP	1.My friends ask for information and suggestions from me frequently because I follow innovations	.69		
	3. I investigate whether there are new ways to do something..	.50		
	5. I generally find new methods to solve problems.	.58		
	8. I think I am someone who easily influences people in terms of innovativeness.	.75		
	9. I think my thoughts and behaviors are creative and unique.	.56		
	11 . I think I am creative.	.62		
	12. I like leading the group regarding innovations.	.62		
RESİSTANCE TO CHANGE	6. I approach new perspectives and new inventions with skepticism.		.65	
	7. I do not adopt new ideas until I see those accepted by the people around me		.70	
	10. I think I am the last person among the ones around me to accept innovations.		.59	
	13. I am reluctant to accept innovations until I see they work for the people around.		.66	
	15 . I think old life style and doing things with old methods is the best way.		.68	
	17. Prior to taking innovations into consideration I want to see that people are using those innovations.		.62	
	20. I am skeptical towards new ideas.		.66	
RİSK TAKİNG	2. I like trying new things.			.59
	16. I struggle against problems and uncertainties.			.49
	18. I am open to new ideas.			.71
	19. Unanswered questions drive me towards finding a solution.			.66
Variance explained %		18.87	17.66	12.80
Total variance explained %		18.87	36.53	49.33

Reliability

In the reliability testing of IIS, the most commonly used method is internal consistency especially in Likert type scales.19 The most commonly used methods in the determination of internal consistency are item analysis and Cronbach Alpha coefficient.[19,21] As a result of the item analysis made in order to test internal consistency in the reliability analysis of IIS, the items with negative and low correlation value were removed from the scale and following the new analysis, item-total score correlation values of IIS were determined to vary between .41 and .62. Correlation value of each item in the scale being above .25 that is accepted as the boundary value indicates that the items measure the characteristic measured by the entire scale.[25]

In other studies in which the scale is evaluated psychometrically in other cultures and sampling groups, item-total score correlation coefficients showed a distribution either between .21 and .64[26] or between .27 and .51.[27] These findings indicate that item total score correlation coefficient values of the Turkish form of IIS applied to nurses are similar to those in other studies and even the minimum of the former is higher compared to other studies.

For example, Cronbach alpha coefficients being .82 in total whereas.72, .78, and . 80 in sub-scale indicate that the scale has high reliability according to the literature.[28] In other studies, Cronbach alpha coefficient of the scale was found to be 0.89[14], .80[26] and .82.[27] In sub-scale alpha value was determined to vary between.62- .81.[27]

In scale adaptation studies, a 30 - person study group is suggested for test-retest application.[19] In this study, this limit was exceeded and it was applied to a 74-person sampling group two times with a 15-day interval. It has been determined that there is a medium level, positive and significant relation (r=0.60, p=.000) between the two applications. In the original scale, Test Halving Method was used to this aim and equivalence coefficient of halving was found to be 0.92. Kılıçer and Odabaşı[27] used test-retest method and applied the scale to a 61-person student group with a 2-week interval. They determined that a high level, positive and significant relation between the two applications(r=0.87, p<.05). The correlation value between the first and second applications being of medium level but significant in this study indicates that coherence by time is of sufficient level. The results of all these reliability analyses indicate that the scale is reliable.

Validity

In studies of the adaptation of a scale developed in another culture to a different culture, explanatory factor analysis is conducted to test the structural validity of the scale and present the scale of it in the culture to which it is adapted.[19, 21, 28] As a result of the factor analysis conducted for IIS, KMO coefficient obtained was found to be between 0.80-0.89, which indicates that the sampling is sufficient for conducting factor analysis, and Bartlett test result being significant($p<0.05$) indicates that the data is appropriate for factor analysis.[21,22]

Basic components method for the explanatory factor analysis applied to IIS, Varimax orthogonal rotation method and Scree Plot test was used. As a result of the analyses, a 4-factor of 18-item IIS emerged. However, as a result of the examination of Scree Plot graph, it was observed that the scale could be forced to become a 3-factor structure.[23] Its eigenvalue being above 1.00 can also be evaluated as a result in line with the literature. In the literature, it is stated that the factors with an eigenvalue of +1 or above should be taken into consideration[21,29] and variance ratios of those being between %40-60 is considered to be sufficient.[23]

In the study in which the original scale was developed and which was applied to university students and teachers, despite the fact that a two dimensional structure emerged as a result of the factor analysis conducted for both groups, as a result of the factor analysis conducted by the combination of two groups, items were observed to accumulate in one dimension.[14] In the study conducted by Pallister and Foxall[26] in 4 different consumer groups (retirement, life assurance, mortgage, and investment), the four groups to which the scale was applied were observed to present a five-factor structure whereas each group was observed to present a four-factor structure. In the validity and reliability research conducted by Kılıçer and Odabaşı[27] in the field of education, a four-factor structure emerged. These different results are considered to emerge due to the cultural differences and differences in research groups.

Factor loads of the items of IIS being between 0.49 and 0.75 revealed that there are loads with application significance.[21,29] In other studies, similarly factor loads were determined to vary between 0.52 - 0.76[14], 0.36 - 0.78.[27] In the naming of the 3 factors that emerged, harmony with the names in both the original scale and in other studies was taken into consideration.[14,27] This way, validity of the scale, reliability of which was provided, has also been provided.

Regarding the evaluation of the scale, it has been determined that the scores obtained from the scale in the determination of innovativeness categories according to total score indicated normal distribution and grouping was performed based on the categories of Rogers.[30]This grouping was determined to be similar to the grouping in the study of Kılıçer and Odabaşı.[27] According to the analysis result based on the difference of lower and upper group averages and carried out in order to test the ability to distinguish persons in terms of the characteristic measured by IIS, IIS was determined to have ability to distinguish traditionalist nurses from innovative nurses.

Evaluation Features of the Turkish Version of Individual Innovativeness Scale in Nursing

The IIS formed as a result of the nursing adaptation study is a likert type (Strongly disagree:1, agree:2,: neutral:3, agree:4, strongly agree:5) scale with 18 items and 3 subscales(idea leadership, resistance to change, risk taking). There are 7 items in the opinion leadership sub-scale (items 1,3,4,7,8,10), 7 items in the resistance to change sub-scale (items 5,6,9,12,13) and 4 items (items 2,14,16 and 17) in the risk taking sub-scale. 11 of the scale items are positive (items 1, 2, 3, 4, 7, 8, 10, 11, 14, 16 and 17) whereas 7 are negative (items 18,15,13,12,9,6,5). Scale scoring can be done by two different methods.

• Calculation method with original scale formula

In this method, the scale score is found by the calculation formula of the original ISS. According to this, the scale evaluation is based not on subscale but on total score. Negative items are not scored inversely. The individual innovativeness score is calculated by adding 42 points to the score obtained by subtracting the negative items from the total positive score. A maximum of 90 points and a minimum of 18 points are taken from the scale.

• Calculation method developed by adaptation study

This score, developed after the adaptation study, is clearer and easier to understand than the other. In this method negative items are scored inversely. Scale sub-scale and total score values are obtained by summing scores from each item. A total of at least 18 and a maximum of 90 points can be obtained from the scale.

According to both scoring methods, individuals who score above 82 are considered “Innovators”, people who adopt or promote innovations early on, between 75-82 are “Early Adopters”, people who act as pioneers for innovation, between 66-74 are “Early Majority”, people who share new ideas in their communities but rarely implement new ideas. Between 58-65 are “Late Majority”, people who have skeptical or timid attitudes towards innovation. Below 57 are “Laggards” people who are least likely to support or adopt innovations.

Conclusion and Implications for Nursing

According to the result of the research, Individual Innovativeness Scale was proved to be a valid and reliable scale that can be used in the determination of the innovativeness levels and categories of nurses in general. The use of this scale in the determination of the innovativeness levels and categories of

nurses can be suggested. It also is a scale that might be used by nursing managers to specify the modernist employees, traditionist nurses that may object to change and the most important, the team leaders. In addition to this, the scale is suggested to be evaluated psychometrically on nurses working in other cultures as well.

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The Original Form of Individual Innovativeness Scale

	INDİVİDUAL INNOVATİVENESS SCALE	Strongly Disagree(1)	Agree(2)	Neutral(3)	Disagree(4)	Strongly Disagree(5)
1	My peers often ask me for advice or information					
2	I enjoy trying new ideas					
3	I seek out new ways to do things.					
4	I am generally cautious about accepting new ideas.					
5	I frequently improvise methods for solving a problem when an answer is not apparent.					
6	I am suspicious of new inventions and new ways of thinking					
7	I rarely trust new ideas until I can see whether the vast majority of people around me accept them.					
8	I feel that I am an influential member of my peer group					
9	I consider myself to be creative and original in my thinking and behavior.					
10	I am aware that I am usually one of the last people in my group to accept something new					
11	I am an inventive kind of person.					
12	I enjoy taking part in the leadership responsibilities of the group I belong to.					
13	I am reluctant about adopting new ways of doing things until I see them working for people around me.					
14	I find it stimulating to be original in my thinking and behavior.					
15	I tend to feel that the old way of living and doing things is the best way.					
16	I am challenged by ambiguities and unsolved problems.					
17	I must see other people using new innovations before I will consider them.					
18	I am receptive to new ideas.					
19	I am challenged by unanswered questions.					
20	I often find myself skeptical of new ideas.					

The Turkish Version of Individual Innovativeness Scale

	BİREYSEL YENİLİKÇİLİK ÖLÇEĞİ	Kesinlikle Katılmıyorum(1)	Katılmıyorum(2)	Kararsızım(3)	Katılıyorum(4)	Kesinlikle Katılıyorum(5)
1	Yenilikleri takip ettiğim için arkadaşlarım sık sık benden bilgi ve öneri alırlar.					
2	Yeni şeyleri denemekten hoşlanırım.					
3	Bir şey yaparken, yeni yollar olup olmadığını araştırırım.					
4	Problemleri çözmek için genellikle yeni yöntemler bulurum.					
5	Yeni bakış açıları ve yeni buluşlara şüphe ile bakarım.					
6	Çevremdeki insanların kabul ettiğini görene kadar yeni fikirleri benimsemem.					
7	Yenilikçilik konusunda insanları kolay etkileyen bir kişi olduğumu düşünürüm.					
8	Düşünce ve davranışlarımın yaratıcı ve özgün olduğunu düşünürüm.					
9	Çevremdeki insanların arasında yeniliği kabul eden en son kişi olduğumu düşünürüm.					
10	Yaratıcı bir kişi olduğumu düşünüyorum.					
11	Yenilikler konusunda gruba liderlik etmekten hoşlanırım.					
12	Çevremdeki insanların işine yaradığını görünceye kadar yenilikleri kabul etmede isteksiz davranırım.					
13	Eski yaşam tarzının ve işleri eski yöntemlerle yapmanın en iyi yol olduğunu düşünürüm.					
14	Problemlere ve belirsizliklere karşı mücadele ederim.					
15	Yenilikleri dikkate almadan önce diğer insanların o yeniliği kullandığını görmek isterim.					
16	Yeni fikirlere açık biriyim.					
17	Cevaplanmamış sorular beni çözüm bulmaya yöneltir.					
18	Yeni fikirlere karşı şüpheci davranırım.					