

THE PERCEPTION SCALE TOWARDS DISTANCE NURSING EDUCATION (perstoDNE)

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ABSTRACT

The distance nursing education programs provide an alternative way to solve nurse shortage. In creating these programs, the perception of nurses toward distance education are important. The perceptions of nurses are not known in Turkey. There is no a perception scale. The study was carried out to develop the perception scale towards the distance nursing education.

The study was carried out to develop the perception scale towards the distance nursing education. The sample of the study consisted of 777 nurses who agreed to participate in this study. The Perception Scale towards Distance Nursing Education (perstoDNE) is a valid and reliable. The scale's total Cronbach alpha coefficient was found .96. The correlations of each item with total point were between .29 and .63. In factor analysis which is done with varimax rotation for construct validity, whose eigenvalue is over 1, explaining 41.27 %of total variability, 4 factors consisting of 49 items was obtained the scale. These factors are named "Learning", "Communication and Evaluation", "Technology", and "Management". Scale studies should be repeated with nurses who working in different parts of the World. These studies are important for the comparison of the results and the redesign of the scale.

Keywords: The perception scale, distance nursing education, perstoDNE.

INTRODUCTION

International Council of Nursing (2006) stated that there is a link between the number of nurses and health services offered to community and in many countries around the world. There is evidence toward the rise of imbalance nurse supply/demand and there are major differences in nurse ratio in the world. There are 140 thousand nurse shortage in the USA, and it is expected to be 800 thousand nurse until 2020. According to World Health Organization data, in 57 countries it remains per thousand less than 2.3% of nurses, doctors and midwife. This ratio shows that some people cannot even get basic health care in the world (Callister, 2012). In Turkey, there is only one nurse for every 549 people (Turkish Statistical Institute, 2013).

This shows that the number of nurses is not enough in Turkey as well. The International Council of Nurses declared that nurse shortage is an important workplace supply-demand imbalance, especially in developing countries. It is necessary to increase the number of well-educated nurses to meet this demand. ICN declared that the solution can be with the contribution of national, international, educational and legal professional organizations (Rosenkoetter & Nardi, 2007). Mueggenburg (2003) emphasized that health care services are not sustainable only with the increase of nurse numbers. Qualified nurses are required to meet the health needs of the community. Qualified nurses are defined as

individuals who can think critically on the stages of diagnosis, planning, implementation and evaluation during the care process and can work effectively with other members of the health team (Biol, 2007; Lundqvist & Axelsson, 2007).

Aiken et al. (2003) declare that globally high nursing education is influential in meeting the needs of qualified health care, reducing mortality rates and receiving positive patient responses through scientific contributions. Tri-council (2010) state that the health of the nation will be at risk without a highly educated nurse workforce. To raise the level of nurse education is important, to meet the nation's nursing needs and to provide safer, and effective patient care. Tri-council encourages nurses to study at the undergraduate, graduate and doctoral levels regardless of the professional entry level. It states that distance education based on computer technologies is alternative solution to continue the education of nurses (Tri-council 2010).

In this context, the shortage of qualified nurses in the health system and the thought of increasing the level of nurse education has led to increase distance nursing education programs based on computer technology (Schnetter, Lacy, Jones, Bakrim, Allen & O'Neal, 2014; Atack & Rankin, 2002; Gazza & Hunker, 2014; Shea, 2008; Della-Vecchia, 2010; Holly, Legg, Mueller & Adelman, 2008; Talbert, 2009).

Yu & Yang (2006) note that nurses have a positive attitude toward distance learning. They add that these learning methods may be used as a new in-service educational method for nurses. The study of Friedlander (2006) shows that the attitudes of married nurses toward distance education are positive. Atack (2003) defines that the results of study on distance education courses based on computer technology are positive. The majority of nurses report that distance learning is convenient, and the course content is useful (Atack, 2003). Moore & Kearsley (2005) noted that there are the basic questions that the design team should think about the development of courses to be taught via distance learning. The target audience is important to answer these questions.

The requirements and learning characteristics of the target audience should be defined. Nurses have different levels of nursing education. In this context, the perceptions of the target group with the motivation from the learning centered approach are an important factor to be taken into consideration when establishing the distance nursing education programs.

Studies on the perception of nurses towards distance education is inadequate in Turkey. The PhD thesis of Project manager is "The Attitudes of Psychiatry Nurses towards the Distance Nursing Education (astDNE). The results of that study showed that astDNE is a reliable and valid. It was conducted with 194 nurses, in Istanbul. (Boz Yüksesdag, 2013). In this study, we aimed to repeat scale study with more nurses working in different parts of the Turkey.

METHOD OF THE RESEARCH

The study consists of nurses who working at hospitals in the center of Eskisehir. The total study population consisted of 1873 nurses. The sample of the study consisted of 777 nurses who agreed to participate in this study.

Objectives

The study was carried out to develop The Perception Scale towards Distance Nursing Education.

Research Hypothesis:

H1= The Perception Scale towards Distance Nursing Education is a reliable and valid to measure the perception levels of nurses towards distance nursing education.

Data Collection Tools and Data Collection

Research data were collected by the researcher with the perception Scale towards Distance Nursing Education. The scale was administered to 777 nurses in January 2016.

This data collection tool consists of two parts. In the first part, 15 questions about personal information and in the second part, there are 72 perception statements about distance nursing education. 5 point grading for reactions was preferred for the perception items in this research.

The participants were asked to grade every single one of the perception statements with one of the following categories: "strongly disagree - disagree- neutral- agreed - strongly agreed". To calculate a total for each of the participants, the most positive category was taken as 5 points and the most negative category was taken as 1 point, and every question was given a grade between 1 and 5 (Turgut, 1977).

Evaluation of Data

In data analysis, SPSS version 20 was used. The data were analysed under two title:

- ✓ Development Of The Perception Scale Towards Distance Nursing Education
- ✓ The Perceptions Of Nurses Towards The Distance Nursing Education. However, In This Study, Only The Development Stages Of Perstodne Were Given.

FINDINGS**The development stages of perstoDNE****Creation of Items and the Opinions of Experts**

Perceptions of the target audience in the creation of distance education programs are important elements to consider.

According to literature, the studies about the distance nursing education have been found to be insufficient in Turkey. Especially, there are no studies towards distance nursing education.

On the other hand, a measuring tool is absent for determining attitudes of nurses towards distance nursing education. For this purpose, while creating scale, distance nursing education and distance education literature has been scanned, and the perception scales (Sabancioğullari & Doğan, 2011; Tavşancıl & Keser, 2002; Üstüner, 2007; Dede& Yaman, 2008; Hunt & Bohlin, 1993) related to the subject conducted abroad and in the country were examined. With them, the questions were created using qualitative study results that made by project manager with 20 nurses as well (Boz, 2008). A total of 72 scale items were written.

These items were presented to experts to ensure content validity. Experts were asked their opinions on expressive style, content, relevance to the subject area of items. According to experts, some items were revised. The final version of the scale consisted of 72 items.

Implementation of Draft Version of the Scale

Pre-test were tried on a small group, which is not included in the sample. The small group should have similar features with examples (Tezbasaran, 1996; Karaca, 2004). The draft scale was implemented to 100 nurses working at hospital in Eskisehir who had similar characteristics with the nurses in the sample.

The nurses were asked their opinions towards understandability of the questions, answering time, and applicability of the form. The nurses noted that items were understandable, and the answering time was enough. Then it was passed into the implementation phase of the study. In January 2016, 72 items draft scale was implemented to 777 nurses who worked at hospital in Eskişehir.

Stage of the Construct Validity

Factor analysis was used to examine the construct validity. In this study, explanatory factor analysis was used to determine the unknown perceptions of nurses towards the distance nursing education (Kan, 2007). Before explanatory factor analysis, the data set was examined for suitability for factor analysis (Akbulut, 2010; Büyüköztürk, 2011).

For the purpose, sample size and the method of determining factors were analyzed (Field, 2005; Büyüköztürk, 2011). The sample size was analyzed with Kaiser-Meyer-Olkin and Bartlett's test (Table 1.).

Table 1.
Kaiser-Meyer-Olkin and Bartlett's test

KMO		.948
Bartlett Testi	X ²	13582.028
	Sd	1176
	P	.000

In this study, Kaiser Meyer Olkin (KMO) value were found to be 0.948, Bartlett's test 13582.028 ($p < 0.05$). According to results, the sample size was sufficient and the data was suitable for factor analysis. As to the method of determining factors, this method was used to describe the relationship between variables with the highest and the least number of factors. There are many factors determining method. The most common method is the principal component analysis. Apart from this, there are three methods to determine the number of factors. The first method is called the Kaiser criteria. The factors with eigenvalues 1 and above were taken to the scale. Another method is Catell's scree test. Each of eigenvalue was shown in a graph.

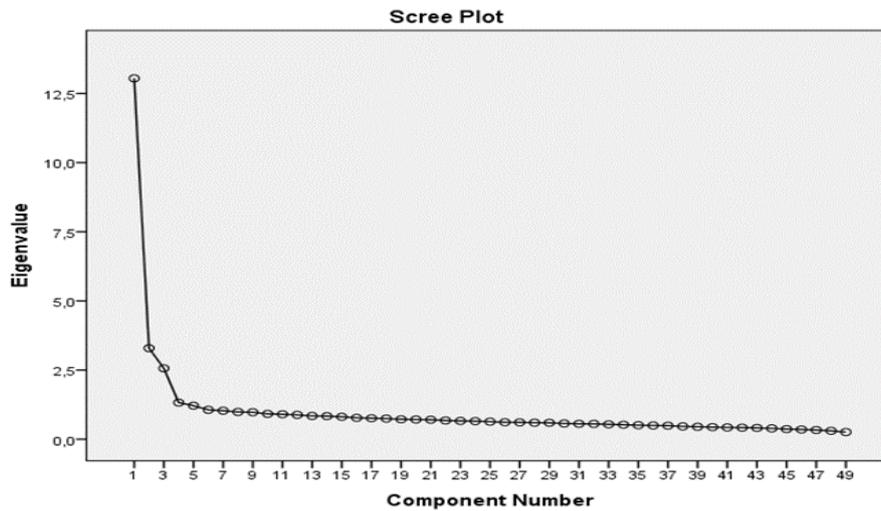


Figure 1.
Catell’s scree test

According to the breaking point of continuity was decided the number of factors of the scale (figure 1.). Figure 1 shows that the breaking point is in the 4th factor. We observed a decrease. We decided that this scale was limited to the fourth factor.

In the factor analysis, it explained the variance of the first factor alone is around 0.30 and the explained variance and the eigenvalues of the following factors declined sharply, indicating that the scale has a single-factor structure (Table 2.).

Table 2.
The ratios eigenvalues and explained variance of the sub-scales

Subscales	Eigenvalue	Explained variance %	Cumulated variance
1. Subscale	13.05	26.62	26.62
2. Subscale	3.29	6.72	33.34
3. Subscale	2.56	5.23	38.57
4. Subscale	1.33	2.70	41.27

According to table 2, the eigenvalue of the first factor is 13.05, the explained variance of first factor is 26.62.

Eigen value of the second factor is 3.29, the explained variance of second factor 6.72. Eigen value of the third factor is 2.56, the explained variance of third factor is 5,23. Eigen value of the fourth factor is 1.33, the explained variance of fourth factor is 2.70. The total variance of the scale was 41.27%.

The higher the variance ratio, the stronger the factor structure of the scale (Gorsuch, 1974; Comrey & Lee, 1992).

In social sciences, 40%-60% are considered ideal variance ratios (Büyüköztürk, 2011). According to the results, the obtained variance ration, was sufficient or within the ideal level (Table 2).

Another method used in the choosing of items is factor load value. Factor load value explains relationship between items and subscales. Factor load value is 0.45 or higher than 0.45 is a good measure for item selection (Büyüköztürk, 2011).

However, in practice these values can be reduced to 0.30 for a small number of substances.

In this study, the least load value was 0.30. The Principal Component Analysis was applied to the 69-items.

Items with low variance and factor load less than thirty percent were removed from the scale. These items were the 20th, and 26th. So, it was remained 67 items on the scale. It was observed that 67 items were in factor one. Factor -1 load values ranged from 0.30-0.40.

Varimax rotation was applied to data to make easier to interpret. The 6th, 8th, 9th, 13th, 17th, 18th, 19th, 22nd, 23rd, 28th, 42nd, 43rd, 51st, 53rd, 57th, 58th, 60th, and 69th items with high-factor load value under multiple factors were removed from the scale. So, the scale has become to a 4 factors and 49-item scale. Item-Total Correlations, Principal Components and Factor Analysis Results in the Load Values of this scale were presented in table 3.

Table: 3.
Item-Total Correlations, Principal Component's and Factor Analysis Results in the Load Values

Item No	Item-Total Correlations	Communality	Factor-1 Load Value (Before rotation)	Factor 1	Factor 2	Factor 3	Factor 4
1.	,398	,611	,442				,70
2.	,469	,664	,510				,71
3.	,451	,521	,488				,60
4.	,393	,462	,432				,57
9.	,417	,426	,428		,62		
10.	,430	,353	,447		,55		
11.	,554	,393	,593	,56			
13.	,476	,299	,514	,50			
14.	,317	,320	,319		,49		
15.	,444	,356	,455		,50		
20.	,371	,406	,379		,63		
23.	,485	,324	,527	,54			
24.	,422	,359	,432		,50		
26.	,600	,452	,644	,56			
28.	,577	,430	,618	,61			
29.	,556	,417	,596	,50			
30.	,518	,489	,546			,62	
31.	,522	,381	,567	,56			
32.	,505	,381	,547	,53			
33.	,420	,341	,435		,53		
34.	,406	,370	,417		,58		

35.	,384	,399	,400		,60		
36.	,507	,367	,551	,57			
37.	,532	,371	,571	,54			
38.	,405	,392	,411		,54		
39.	,587	,425	,628	,55			
40.	,511	,404	,557	,60			
43.	,303	,232	,344	,43			
44.	,634	,495	,675	,62			
45.	,402	,447	,407			,57	
46.	,537	,480	,564			,60	
47.	,465	,509	,493			,64	
48.	,560	,412	,599	,57			
49.	,567	,428	,604	,60			
51.	,501	,373	,540	,57			
53.	,461	,384	,480		,54		
54.	,494	,448	,524			,57	
55.	,367	,488	,372			,58	
58.	,446	,422	,468			,60	
60.	,525	,353	,566	,54			
61.	,465	,408	,481		,58		
63.	,444	,370	,458		,56		
64.	,286	,186	,320	,38			
65.	,556	,388	,596	,56			
66.	,520	,495	,554			,59	
67.	,517	,493	,530			,56	
69.	,606	,443	,645	,59			
70.	,596	,462	,638	,62			
71.	,545	,392	,585	,58			

According to the table 3. the load factor values of items in the first sub-scale was. 38-.62, in the second sub-scale was between. .49-.63; in the third sub-scale was. 56-.64, and in the fourth subscale between found .61-.69.

Table 3. shows that the items of the Scale were highly correlated with each other. The scale has a strong factor structure. This measures perceptions toward distance nursing education.

The sub-scales of perstoDNE were named in consideration of the meaning of perception expressions (table 4.). The first sub-scale was named "Learning", the second one was named "Communication and Evaluation", the third one was named "Technology", the forth one was named "Management".

Table 4.
The Subscales of the perstoDNE and Items

Subscales	Items No
Learning	11., 13., 23., 26., 28., 29., 31., 32., 36., 37., 39., 40., 43., 44., 48., 49., 51., 60., 64., 65., 69., 70., 71
Communication and evaluation	9., 10., 14., 15., 20., 24., 33., 34., 35., 38., 53., 61., 63.
Technology	30. 45. 46. 47. 54. 55. 58. 66., 67.
Management	1. 2. 3. 4.

Table 4. shows that the first subscale contains twenty-three items, the second subscale contains thirteen items, the third subscale contains nine items and the fourth subscale contains four items.

The Reliability Stage of perstoDNE

In determining the reliability of the measurement tool were used techniques such as calculation of coefficient of internal consistence (Cronbach Alpha), and item-total correlations methods.

In this study, Cronbach Alpha of the draft scale was found 0,96. This value indicates that the draft scale was reliable. Another method to measure reliability is the item-total correlation.

Item-total correlation illustrates the relationship between the scores obtained from items and item total correlation. In selecting of the items, item-total correlation coefficient was based on criteria that the value is above 0.20 (Tavsancıl & Keser, 2002; Büyüköztürk, 2011).

Excluding the seventh, the sixty-third and the seventy-second items, the item-total correlation coefficient of each item on the scale was found to be over 0.20.

This finding shows 69-items have distinctiveness. The reliability findings of perstoDNE were given in table 5.

Table 5.
Item Analysis Results toward the total of perstoDNE

Item No	Scale Mean If Item Deleted	Scale Variance If Item deleted	Corrected Item total Correlation	Cronbach's Alpha If Item Deleted
1	126,75	580,894	,398	,940
2	126,37	575,399	,469	,939
3	126,42	574,324	,451	,939
4	126,13	576,652	,393	,940
9	126,38	574,687	,417	,939
10	126,38	575,867	,430	,939
11	126,50	568,243	,554	,939
13	126,44	572,360	,476	,939
14	126,32	579,520	,317	,940
15	126,35	574,498	,444	,939
20	126,47	576,824	,371	,940
23	126,39	572,700	,485	,939
24	126,23	574,607	,422	,939
26	126,49	567,866	,600	,938
28	126,34	568,355	,577	,938
29	126,35	569,043	,556	,939

30	126,34	568,235	,518	,939
31	126,40	571,424	,522	,939
32	126,39	570,762	,505	,939
33	126,37	573,989	,420	,939
34	126,41	575,783	,406	,939
35	126,38	576,356	,384	,940
36	126,34	570,172	,507	,939
37	126,36	568,745	,532	,939
38	126,39	575,844	,405	,940
39	126,42	567,097	,587	,938
40	126,45	571,124	,511	,939
43	126,71	582,825	,303	,940
44	126,53	567,427	,634	,938
45	126,39	573,195	,402	,940
46	126,26	568,533	,537	,939
47	126,31	572,788	,465	,939
48	126,45	567,158	,560	,938
49	126,45	568,055	,567	,938
51	126,38	571,778	,501	,939
53	126,44	572,079	,461	,939
54	126,30	571,000	,494	,939
55	126,24	576,110	,367	,940
58	126,34	572,567	,446	,939
60	126,37	569,058	,525	,939
61	126,37	571,832	,465	,939
63	126,44	575,234	,444	,939
64	126,34	580,288	,286	,940
65	126,38	570,821	,556	,939
66	126,29	569,093	,520	,939
67	126,28	568,533	,517	,939
69	126,41	565,757	,606	,938
70	126,34	567,631	,596	,938
71	126,36	569,788	,545	,939

According to the table 5, Cronbach's Alpha value did not decrease when item was deleted. So, the reliability of the perstoDNE did not decline. The corrected item-total correlation was found between .29 and .63. If item-total correlation is positive and high, that means that items measure similar behavior, and shows that the scale has a high internal consistency. These high rates pointed out those 49-items have distinctiveness. The perception Scale towards Distance Nursing Education presented in table 6.

Table 6.
The Perception Scale towards Distance Nursing Education (perstoDNE)

•	In terms of time and place distance education provides flexibility to nurses
•	In distance nursing education should be provided to students problem-solving focused trainings
•	In distance nursing education, monitoring images toward diseases and nursing care facilitates learning process.
•	In distance nursing education, courses supported by visual material facilitates learning.
•	In terms of time and place to be flexible of distance education facilitates learning.
•	In distance nursing education, educators giving the face to face and remote consultation to students reinforces learning.
•	In distance nursing education students can access documents related to courses any time they want
•	In distance nursing education all resources about the field can be accessed easily.
•	In distance nursing education, knowledge sharing among students is easier.

<ul style="list-style-type: none"> • It is important to get in touch with the instructor and other students in virtual chat environments
<ul style="list-style-type: none"> • In distance nursing education, giving the animations of basic courses like anatomy and physiology facilitates learning process.
<ul style="list-style-type: none"> • In distance nursing education students can more easily express themselves by writing during the lecture and discussion environments. • In distance nursing education, gaining communication skills are important for the nursing profession. • In distance nursing education, offered communication opportunity with nursing students in key schools in the world important in terms of professional development. • In distance nursing education before stepping to the education of field, it is necessary to gain students with basic computer technology skills.
<ul style="list-style-type: none"> • Receiving technical support when students have problems with computer technology, it increases their education satisfaction.
<ul style="list-style-type: none"> • In distance nursing education, use of technology brings diversity to teaching/learning methods.
<ul style="list-style-type: none"> • In distance education, student performance is evaluated more fairly than face to face education.
<ul style="list-style-type: none"> • In distance education, oral exams discussing the case, would be effective in student achievement
<ul style="list-style-type: none"> • In distance education, observation of the students participating in the course would be effective in evaluation.
<ul style="list-style-type: none"> • In distance education at the end of each lesson teachers giving feedback to students about their success is useful in terms of effectiveness of education
<ul style="list-style-type: none"> • In distance education students should be given individual assignments to direct them reading and researching. • In distance education, group assignments prepared with other students are useful. • All courses in the nursing program cannot be given through distance education.
<ul style="list-style-type: none"> • In distance education, financially computer technology (online) exams instead of face-to-face exams are more convenient for students.
<ul style="list-style-type: none"> • In distance education, student nurse's active participation in the course is not possible
<ul style="list-style-type: none"> • Through distance education only the theoretical knowledge of the nursing profession can be given.
<ul style="list-style-type: none"> • In distance education, students who graduate without encountering patients cannot give adequate nursing care.
<ul style="list-style-type: none"> • In distance education, excessive and detailed information in textbooks makes learning difficult. • In distance education, it is difficult to communicate with other students at the same time. • In distance education, students have the problem of loneliness. • In distance education, level of collaboration among students is low. • In distance education, ability for empathy cannot be gained to students who do not encounter patients. • In distance education, using technology besides the nursing course brings an extra burden to students. • In distance education, clinical skills of students cannot be evaluated.
<ul style="list-style-type: none"> • In distance education, nursing knowledge and skills cannot be measured by multiple-choice questions.
<ul style="list-style-type: none"> • In distance education, motivation of students is associated with their age • In distance education students have problems about the use of technology
<ul style="list-style-type: none"> • In terms of the effectiveness of the distance nursing education, educators should have a good degree of computer technology skills
<ul style="list-style-type: none"> • In distance education students who have the ability to use computer technology are more successful
<ul style="list-style-type: none"> • In distance education the only condition for being

	successful is to use computer technology in a good level.
•	In distance education, educators do not need to know a good level of technology.
•	In distance education, it is easier to communicate via e-mail with the instructor
•	In distance education students can be assessed better with online exams.
•	In distance education, assessment of student achievement with the applications in the clinic is more effective.
•	Developments in health systems can be followed more easily through the distance education.
•	Distance education solves the qualified nurse problem in health institutions.
•	Professional development can be maintained through distance education at any time.
•	In distance education it is needed more educators than formal education

RESULTS AND DISCUSSIONS

Results

Consequently, findings showed that The Perception Scale towards Distance Nursing Education (perstoDNE) is a valid and reliable. The research findings supported the hypothesis 1.

Discussions

This study is limited to the levels of participation of nurses who included in the study to the perception expressions on the scale and with explanatory factor analysis in the validity study. Scale studies should be repeated with nurses working in different parts of the World. In addition, confirmatory factor analysis should be done to test this model. These studies are important for comparison of results and the redesign of the scale.

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