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# Psychometric Evaluation of Iranian Version of the Evidence-Based Practice Questionnaire (EBPQ): A Methodological Study

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## Abstract

**Background:** There are different tools for assessing evidence-based practice in nursing in Iran, however, there are some limitations in each of them, and they do not examine EBP comprehensively.

**Objectives:** The purpose of this study was to evaluate the validity and reliability of the Persian version of EBPQ.

**Methods:** This study was a methodological research on 300 nurses working in Guilan province (Iran). A cluster sampling was done. After a forward-backward translation, the questionnaire was translated into Persian and its psychometric evaluation was done.

**Results:** CVIs for all items were  $\geq 0.8$  and CVRs were  $\geq 0.63$ . All of the impact scores were  $> 1.5$ . Cronbach's alpha of the scale was 0.92. The ICC test was 0.96 and significant ( $P < 0.001$ ). In exploratory factor analysis, KMO was 0.84 and Bartlett's test was significant ( $P < 0.001$ ). Confirmatory factor analysis showed an acceptable fit model.

**Conclusions:** This study introduces the evidence-based practice questionnaire (EBPQ) as a valid and reliable tool to assess the status of evidence-based practice among nurses in Iran.

**Keywords:** Barriers, Nursing, Clinical Nurses, Evidence-Based Practice, Questionnaire

## 1. Background

During the past two decades, the term evidence-based practice (EBP) has been considered by health care systems, and nursing researchers (1, 2). The evidence is not limited to only knowledge, but also, it is a process, taking into account the conditions and available resources, nurses use of scientific studies combined with nurse's personal experiences and opinions, values, and needs of patients for the best clinical decision making (3). According to studies, EBP helps improve the quality, effectiveness, and safety in Care (4), as well as reduces health care costs (5-7) and nurses who make use of EBP have better health care decisions. Since nowadays offering high quality service is an important challenge for healthcare systems, promoting EBP in nursing is one of the most important goals of such systems (8, 9). However there are many barriers to the implementation of EBP, for example, most nurses rely solely on their own experiences, and only 25% of nurses tend to prefer evidence-based practice (6, 10, 11). Therefore it is crucial that healthcare organizations recognize facilitators, barriers and nursing skills because its impact on promoting

EBP.

Shin and Lee (2017) showed the social and organizational factors such as greater opportunities to exchange nurses' ideas and the communication skills as facilitators of EBP in nursing (12). Yeganeh et al. (2016) resulted application of guidelines in nursing practice was a facilitator and lack of knowledge of nurses about it was a barrier in EBP (13). Black et al. (2015) confirmed studies about knowledge, skills, facilitators, and barriers bridged the gap between practice and knowledge (14). Tacia et al. (2015) believed the lack of comprehensive valid and reliable tools using study was a barrier in EBP (15).

In Iran, there are several tools to measure knowledge, attitude, and practice of evidence-based nursing, however, no standard tool exists that assesses barriers, facilitators, resources and self-reports on nursing skills in the use of evidence comprehensively. In this study, we evaluated the characteristics of psychometric of EBP in the context of Iran.

## 2. Objectives

The objective of this study was the psychometric evaluation of the evidence-based practice questionnaire (EBPQ) in an Iranian population.

## 3. Methods

### 3.1. Study Design

This research was a methodological study. According to the protocol of WHO, in the first part searches were done for selecting an appropriate questionnaire regarding EBP in Nursing. The second part was translation and evaluation of its psychometric properties.

### 3.2. The Process of Selection and Introducing EBPQ

After the literature search, EBPQ of Gerrish et al. (2007) was selected as a complete tool and permission was obtained from the initial designer of the questionnaire. The EBPQ is a self-report questionnaire consisting of five dimensions, and 49 items (5) included: 'Bases of practice knowledge' (22 items), 'Barriers to finding and reviewing evidence' (10 items), 'Barriers to changing practice on the basis of evidence' (5 items), 'Facilitation and support in changing practice' (4 items), and 'Skills in finding and reviewing evidence' (8 items).

### 3.3. Validity Procedure

After translation, qualitative and quantitative face and content validity, and construct validity were used.

### 3.4. Translation

Forward-backward translation was performed with two dominant Persian translators that translated it from English to Persian, independently. Only one of the translators was familiar with the concept of EBP. Then a panel was formed (Included 2 professors in nursing and experienced in methodological studies, 3 instructors that were experienced in EBP studies and 2 translators) and the experts were in agreement regarding the choice of the most telling words for the items. In the next step 'back translation' was carried out by a person who had lived in America, without reading the original version of EBPQ. Next, it compared with the original version of the questionnaire and the Farsi version of EBPQ was obtained after reviewing the appropriateness of words with Iranian culture of nursing. Also, a pilot study was conducted with 30 nurses working in hospitals of the Guilan University of Medical Sciences in the north of Iran (GUMS). They introduced ambiguous points and after the change in the wording of 3 items, the final version of EBPQ in Farsi was prepared.

## 3.5. Validity Assessment

### 3.5.1. Face Validity

For face validity, 10 nurses were interviewed about their understanding of the items. In qualitative content validity, we requested 11 individuals specializing in nursing and the field of EBP to explain about writing, the grammatical problems, and the scoring. Item impact method was used for quantitative content validity (with 10 participants). Also, we used CVR method and point views of 11 experts in nursing (with acceptable value  $\geq 0.63$  (16)), and CVI and panel of 15 researchers that were expert in nursing and EBP and acceptance rate  $\geq 0.8$  (17). Content Validity assessment was performed using exploratory and confirmatory factor analysis. In this study, Factor loadings  $\geq 0.4$  was used.

### 3.6. Reliability

To determine internal consistency, Cronbach's alpha values of  $\geq 0.7$  were accepted (18). Also, Test-retest was performed with an interval of two weeks and 30 participants. For assessing stability, intraclass correlation coefficient (ICC)  $\geq 0.8$  was acceptable. Before the ICC, we checked normality of the distribution by Kolmogorov Smirnov test. It was normal in all of the dimensions and the total items ( $P > 0.05$ ).

### 3.7. Participants and Data Collection

Nurses in hospitals of GUMS participated in the study. Primarily, we provided a list of the hospitals. By a cluster sampling, from 25 governmental hospitals, 10 ones from different Geographical areas of Guilan province were randomly selected. In factor analysis, 5 to 10 samples are sufficient for per item of questionnaire and minimum sample size 300 and KMO  $> 0.6$  is acceptable (19, 20). Since a number of questionnaires may not be answered, to prevent sample deficiency, in a simple random sampling 320 nurses (32 nurses in each hospital) were chosen. 14 nurses did not respond to the questionnaires and six questionnaires were incomplete. Therefore, 300 questionnaires were analysed. Sampling phase was carried out from September to October 2016. Inclusion criteria were having a Bachelor's degree in nursing and full-time work, and exclusion criterion was nurses who worked in those centers just part-time. We did not have any exclusion criteria.

### 3.8. Ethical Considerations

This study was approved by the ethics committee of GUMS (Number: IR.GUMS.REC.1396.95). We explained regarding the aims of the study and assured the participants that their personal information will remain confidential. Then the written informed consent was obtained from all

of them. Also, they were assured that participation in the study is voluntary.

### 3.9. Statistical Analysis

Statistical analysis was performed using SPSS version 16 and the linear structural relations (LISREL). Descriptive statistics were employed for analyses of the items and dimensions of the questionnaire. For assessing the validity of EBPQ we calculated CVI, CVR, exploratory (KMO and Bartlett's tests) and confirmatory factor analysis. Alpha coefficient and ICC values were used for reliability of the new instrument.

## 4. Results

The sample included 294 women (98%). The age range of the samples was 22 to 55 years old and the mean age was  $34.32 \pm 8.42$  (Table 1).

The CVI for all items of the questionnaire was 0.8 and above and total CVRs were  $\geq 0.63$ . The values of impact scores on all items were  $> 1.5$ . In examining the reliability of the questionnaire Cronbach's alpha of the questionnaire was 0.92. ICC was significant ( $P < 0.001$ ) (Table 2). In examining the construct validity and exploratory factor analysis, KMO test was 0.84, indicating the sampling adequacy for the factor analysis (Table 3). Bartlett's test ( $P < 0.001$ ) suggested a significant relationship between items and adequacy of factor analysis test. Scree plot was used to determine the number of dimensions of EBPQ (Figure 1) and after orthogonal varimax rotation, 4 factors were determined. Confirmatory factor analysis was performed (Table 4). Path diagram in all of the indices showed an acceptable strong goodness of fit for each factor and total scale (Figure 2).

The extracted factors explained 51.6% of the total variance, and factor 1 to 4, respectively explained 16.42%, 11.87%, 11.75%, and 11.56% of the total variance. The minimum of the factor load was 0.3 (Table 5). The four factors in EBPQ were labeled as "barriers to change in evidence-based practice" (15 items), "knowledge sources used in nursing practice" (12 items), "self-assessment of nursing skills level in the evidence retrieval" (8 items) and "facilitators evidence-based practice" (14 items).

The means of dimensions of the questionnaire were respectively for "barriers to change in evidence-based practice"  $37.95 \pm 10.75$ , "knowledge sources used in nursing practice"  $31.8 \pm 8.16$ , "self-assessment of nursing skills level in the evidence retrieval"  $20.09 \pm 5.75$ , "facilitators evidence-based practice"  $36.29 \pm 8.63$  and total score  $126.13 \pm 23.55$ .

**Table 1.** Demographical Characteristics of the Participants (N = 300)

Variables	No. (%)
<b>Age, y, (mean <math>\pm</math> SD, <math>34.32 \pm 8.42</math>)</b>	
20 - 30	126 (42)
31 - 40	98 (32.7)
41 - 50	67 (22.3)
> 50	9 (3)
<b>Gender</b>	
Female	294 (98)
Male	6 (2)
<b>Education</b>	
Bachelor	289 (96.3)
Masters degree	11 (3.7)
<b>Work experience, y</b>	
1 - 10	169 (56.3)
10 - 20	92 (30.7)
20 - 30	39 (13.0)
<b>Type of shift work</b>	
Shift rotation	246 (82)
Head nurse	18 (6)
In charge nurse (Day work only)	24 (8)
Supervisor	12 (4)
<b>employment status</b>	
Fixed term	141 (47)
Permanent	46 (15.3)
Temporary	71 (23.7)
New graduate nurses	42 (14)

After obtaining the Iranian version of the questionnaire of EBP, Ceiling and floors effects on the scores obtained were analyzed using statistical methods. In this context, none of the participants had scored Ceiling and floors.

## 5. Discussion

The results of this study confirmed the validity and reliability of the Persian version of EBPQ, and therefore, it can be used for evaluation of evidence-based practice in nursing.

In this study qualitative content and face validity were used, in addition to the CVR and CVI for determining the questionnaire validity. Also, the average of scale content validity index (SCVI/Ave) was calculated as 0.9, that is acceptable (21). In examining the reliability of the questionnaire, internal consistency, Cronbach's alpha was 0.92 of

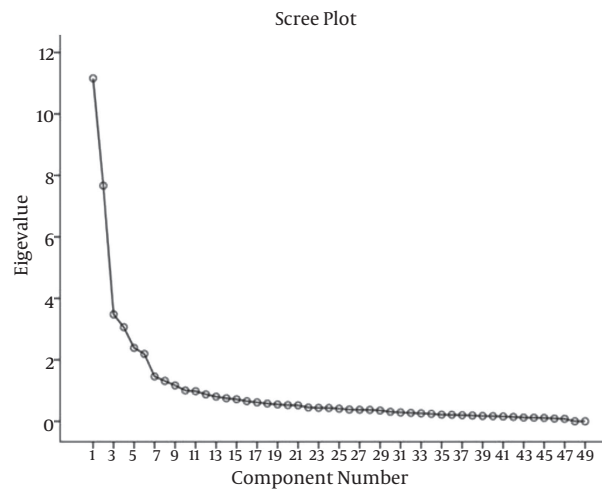


Figure 1. Scree Plot to Determine the Number of Constructing Factors of EBPO

Table 2. Intraclass Correlation Coefficient, Cronbach's Alpha Values, Means, and Standard Deviations of the Four Factors

Dimensions	Cronbach's Alpha Coefficient	ICC	Mean ± SD	Number of Items
Barriers to change in evidence-based practice	$\alpha = 0.93$	0.99	35.14 ± 9.99	15
knowledge sources used in nursing practice	$\alpha = 0.87$	0.98	31.80 ± 8.16	12
Self assessment of nursing skills level in the evidence retrieval	$\alpha = 0.87$	0.89	20.09 ± 5.75	8
facilitators evidence-based practice	$\alpha = 0.88$	0.97	36.29 ± 8.63	14
<b>Total</b>	$\alpha = 0.92$	0.962	123.32 ± 23.06	49

Table 3. KMO and Bartlett's Test

Variables	Value
Kaiser-Meyer-Olkin measure of sampling adequacy	0.846
<b>Bartlett's test of sphericity</b>	
Approx. Chi-Square	7.763E3
df	1176
Sig.	0.001

the entire questionnaire and within acceptable limits that were satisfactory (22). Internal consistency of the instrument indicated a degree of homogeneity in components of the tool (23).

In assessing external consistency, ICC showed a good stability over time (24). However, in the original study of the design of the questionnaire, no report was submitted regarding the conduct Test-retest and stability of this questionnaire (25). In examining the construct validity and exploratory and confirmatory factor analysis, the high KMO and goodness of the model were the strengths of this study

and revealed the high quality of factor analysis to determine the factors (21). Most of the nurses expressed difficulty understanding study results in the research journals, as the biggest barrier, and personalized search, as the least skill. They also introduced medical support as the most common facilitator in this field.

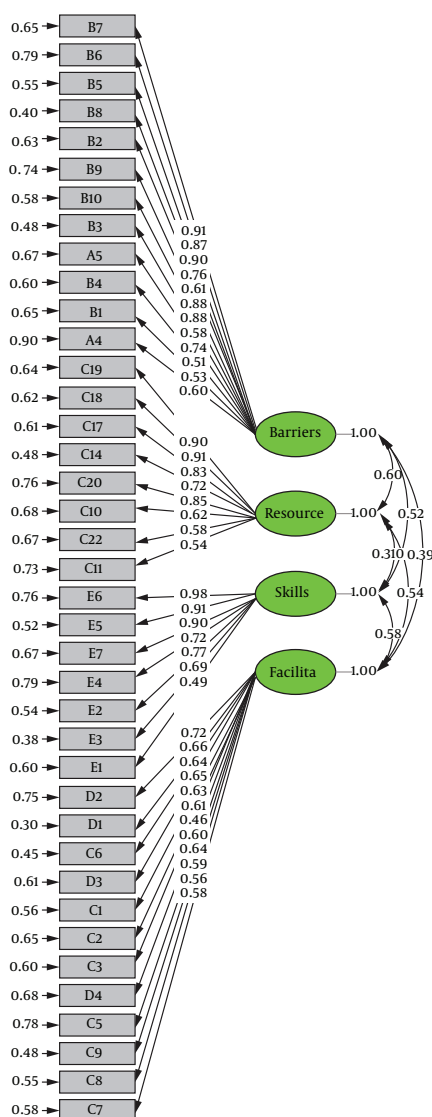
Khammarnia et al. (2014) introduced personal aspects such as lack of special English proficiency, and weaknesses in working with the computer as the major barriers, and medical support as facilitating factor in EBP (8). Sanjari et al. (2015) demonstrated a lack of physician support in the implementation of evidence-based practice as one of the barriers to implementation of EBP (26).

### 5.1. Conclusion

This study presented EBPO as a valid and reliable tool to evaluate the status of evidence-based practice in Iranian nursing. This questionnaire is a simple tool in EBP in nursing. It can be applied by nursing Policymakers to assess barriers, and adopt solutions to problems.

**Table 4.** Results of Fit Index CFA of the Iranian Version of the Evidence-Based Practice Questionnaire (N = 300)

Statistical Index	X2	df	X2/df	NNFI	RMSEA (90% CI)	CFI	NFI	IFI
Goodness	1436.86	676	2/12	0.98	0.058	0.98	0.95	0.98

**Figure 2.** Path Diagram of Confirmatory Factor Analysis of EBQP

## 5.2. Strengths and Limitations

In this study quantitative and qualitative content validity, construct validity and test-retest were strong point compared to the original. Most of the standard questionnaires in Iran investigate the knowledge, attitude and prac-

tice regarding EBP but the questionnaire is new because it assesses facilitators, barriers, knowledge sources and nurses' skill in EBP. The self-report questionnaire was the limitation of this study.

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## Footnotes

**Authors' Contribution:** Mohammad Reza Yeganeh, Moluk Pouralizadeh and Abbas Ebadi contributed to the study design, the statistical analysis, and the critical revision of the manuscript for important intellectual content and wrote the final version of the paper.

**Conflict of Interests:** The authors declare that there is no conflict of interest.

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**Table 5.** Results of Exploratory Factor Analysis Using Rotated Component Matrix

Factors and Items (% of Cumulative Variance = 51.6)	Rotated Component Matrix
<b>(Factor1): "barriers to change in evidence-based practice" "barriers to change in evidence-based practice", (% of Variance = 16.42)</b>	
Identifying implications of organizational information in my own practice is difficult for me	0.83
Identifying the application of research findings in my own practice is difficult for me	0.82
Understanding the results of the research report is difficult for me	0.80
Finding organizational information (including the Guidelines, protocols, etc.) is not easy for me	0.77
I can not confidently judge about the quality of research reports	0.75
I do not know how to find appropriate research reports	0.74
Organizational information (including protocols, guidelines, etc.) are found with difficulty	0.74
Research reports are not found easily	0.72
I do not feel confident about starting to change my practice	0.70
There are insufficient resources (such as equipment) to make changes in practice	0.69
I do not have enough time to find organizational information (including guidelines and protocols)	0.68
I do not have enough time to find research reports	0.66
My team culture is not receptive to change in practice	0.65
I do not have authority in the work place to make changes in practice	0.59
I do not have enough time to search research reports	0.42
<b>(Factor2): "knowledge sources used in nursing practice" (% of Variance = 11.87)</b>	
I get my scientific information from articles published in research journals	0.84
I get my scientific information from articles published in medical journals	0.83
I get my scientific information about treatments and medication from representatives of the equipment and pharmaceutical companies	0.69
I get my scientific information from articles published in nursing journals	0.68
I get my scientific information from local audit reports	0.63
I get scientific information from my intuition about what seems to be right for the patient	0.62
I get my scientific information from the media (magazines, TV, etc.)	0.56
I get my scientific information from national policy guidelines	0.53
I get my scientific information from the Internet	0.44
I get the scientific information the way that I have always done it	0.43
I get my scientific information from textbooks	0.42
I get my scientific information from literature	0.42
<b>(Factor3): "self assessment of nursing skills level in the evidence retrieval" (% of Variance = 11.75)</b>	
Level of your skill to find research evidence	0.89
Level of your skill to find organizational information	0.86
Level of your skill to review the research evidence	0.86
Level of your skill to review organizational information	0.84
Level of your skills using the library to locate information	0.82
Level of your skills using research evidence to change practice	0.77
Level of your skill in the use of organizational information (e.g., guidelines and policies), to changes in practice	0.70
Level of your skills when you use the Internet to search for information	0.46



**(Factor4): "facilitators evidence-based practice: (% of Variance = 11.56)**

Nursing managers support changes in my practice	0.73
Nurse colleagues support changes in my practice	0.69
I get my scientific information from what my colleagues have shared with me	0.69
Head nurses support the change in my practice	0.67
I get the information of researches through attending in-service training conferences	0.62
I get the scientific information the ways that I have always done it	0.58
I get my scientific information from the personal experience of caring for patients over time	0.57
The doctors with whom I work are supportive of my changing practice	0.57
I get my scientific information from what the doctors discuss with me	0.54
I get new information from treatments and medications that the doctors have prescribed for patients	0.52
I get my scientific information from the local policies and protocols	0.52
I get my scientific information from senior clinical nurses share such as clinical nurse specialist and nurses practitioners	0.46
I get the scientific information using my personal training	0.42
I get the scientific information from what has worked for me for years	0.40