

**ORIGINAL ARTICLE****Testing Psychometrics of Healthcare Empowerment Questionnaires (HCEQ) among Iranian Reproductive Age Women: Persian Version****Bahram Mohebbi<sup>1</sup>, Azar Tol<sup>2</sup>, Elham Shakibazadeh<sup>3\*</sup>, Mahdi Yaseri<sup>4</sup>, Maryam Sabouri<sup>5</sup>, Feleke Doyore Agide<sup>6,7</sup>****OPEN ACCESS**

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**ABSTRACT**

**BACKGROUND:** Producing high quality data needs an accurate measurement in any fields of study. This study aimed to test psychometrics of the Persian version Healthcare Empowerment Questionnaire (HCEQ) in relation to personal care among Iranian reproductive age women and to validate the instrument for future use.

**METHODS:** A cross-sectional study was conducted on 549 reproductive age women in a health centers affiliated to Tehran University of Medical Sciences producing a response rate of 100%. Content validity was established using translation and back-translation procedures, pilot testing, and getting views of expert panel. Construct validity was measured using explanatory factor analysis. Cronbach's alpha was used to measure internal consistency, and intra-class correlation coefficients were used to confirm stability.

**RESULTS:** The results indicated that explanatory factor analysis of 10 items in three dimensions explained 63.2% of the total variance. Validity and reliability of the 10-items of HCEQ with two response scales (perception of control and motivation of being empowered) assessed for internal quality showed the reliability of internal consistency ( $\alpha=0.70$ ; range=0.62-0.76). The correlation between convert (10 items) and apparent (3 factors) variables was 0.5 times higher than the revealed convergent validity.

**CONCLUSION:** The findings of this study supported the reliability and validity of the Persian version of HCEQ to assess the degree of individual empowerment in relation to personal healthcare and services among reproductive age women. Therefore, the HCEQ-Persian version could be a useful, comprehensive, and culturally sensitive scale for assessing healthcare empowerment among reproductive age women.

**KEYWORDS:** Healthcare Empowerment Questionnaire (HCEQ), Reproductive Age, Women, Reliability, Validity

## INTRODUCTION

In recent years, various experts including health professionals have increasingly used the term empowerment. It is used to express information, skills, interpretation, emotions and values properly in life (1,2). Health empowerment focuses on responsibility and ability of individuals to maintain their health (1). According to the World Health Organization (WHO), individuals, families and communities should be empowered in order to promote their health (3). Especially, women play a central role in health empowerment of their families. Women's health assures the health of children and families (4).

Various research findings showed that women's health care empowerment is affected by several social, economic, and cultural factors including poverty, economic dependency, discrimination and violence against women. This is manifested by restricted power and authority in life, and wide continuum of women needs to health care (5).

The international conference on development and population specified women's empowerment as a cornerstone of achieving desirable health especially reproductive health (3,5-7). Women's healthcare empowerment brings better life satisfaction, improved interaction with others and the environment, and improved abilities to confront health problems (8-12).

To date, a variety of instruments exist to assess healthcare empowerment (13-15). However, there are few questionnaires that address multi-dimensional perspectives on psychometrics of healthcare empowerment of women. For instance, the questionnaire developed and validated by Gagnon et al in 2006 on healthcare empowerment measures the degree of individual empowerment in relation to personal healthcare and services. Psychometric findings have shown that the HCEQ appears to be useful in advancing knowledge about individual empowerment in relation to personal healthcare and services (16). The study on women's healthcare empowerment is very limited in Iran, and due to this reason, few validated questionnaires exist. Therefore, the study aimed to

translate the HCEQ into Persian and broadly test its psychometric properties as regards women's healthcare empowerment among Iranian women to present a validated tool to Persian language countries.

## MATERIALS AND METHODS

### **Study design, research population and sample:**

A cross-sectional study was conducted on 549 reproductive age women in health centers affiliated to Tehran University of Medical Sciences through multi-level cluster sampling method to provide a maximum of ten respondents per item on HCEQ (16). Individuals aged 18-45 years and had active medical files in the clinics were eligible to participate in the study.

**Data collection:** Data were collected from November 2016 to February 2017 by four trained public health students using interviewer-administered questionnaires. A questionnaire package including a cover letter, questions on socio-demographics and the 10-HCEQ items were given to those who consented. In the qualitative section, the translation and backtranslation process of the original version of HCEQ-10 items was made. Then, translation and backtranslation were reviewed by an independent group of experienced researchers and linguistics (five researchers and two bilingual translators) in order to achieve a modified version of the original questionnaire. They confirmed that the translated version of HCEQ-10 Persian version (HCEQ-10/PV) was culturally and linguistically fitted for Persian women in reproductive age. They also approved that wording and phrasing accordingly. Delphi method was used to check agreement on appearance and content of the translated version. Later, the HCEQ-10/PV was sent to eight academic members who were experts in instrument development and women's health. The evaluation of the experts indicated that the analyzed version and the original one were completely similar in content. The content validity was checked to ascertain whether the content of the questionnaire was appropriate and relevant to the purpose of the study. The modified version transferred to the independent expert panel

included four members, which were responsible to develop the final version of HCEQ-10/PV. In conclusion, content validity of HCEQ-10/PV was checked by experts in the various fields including one gynecologist, two healthcare providers in women's health and two health education and promotion specialists. The original HCEQ-10/PV and the translated version were re-sent to each panel of bilingual member by the expert panel. The content validity was re-evaluated by panel members to rate the level of each item in two response scales: a) perception of control with regard to healthcare and services using 4-point scale (1 = "not at all" to 4 = "extremely"); and b) motivation evaluation as the importance to being (1 = "not important at all" to 4 = "extremely important"). Furthermore, the panel was requested inquired to comment on individual items in relation to the accuracy, simplicity, method, and cultural relevance of the final translated version. The panel recommended some brief to initiate a change and provide modified version of the questionnaire. Later, a pilot study was conducted on the modified version and necessary corrections were made accordingly. Exploratory factor analysis (EFA) was used to assess construct validity. Both Bartlett's Chi-squared test of sphericity and the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy were carried out to see the suitability of analysis (17). The principal component extraction method with Varimax rotation with Kaiser Normalization was used to analyze grouped data descriptively (18). The following criteria were considered: 1) Eigen value >1 (19); 2) Varimax rotation loading level greater than 0.5 to assess whether an item loaded on one factor or the others (20) and 3) significance of description of the factor structure (21). The significance level was set at  $p < 0.01$ . The reliability was tested for internal consistency with Cronbach's alpha value. Moreover, inter-correlation between items was tested with the Pearson correlation, and half split technique was determined by measuring the intra-class correlation coefficient (ICC) to assess inter-rater consistency of the raters. The benchmark for the ICC was as  $>0.75$  = excellent, between 0.40 and 0.75 = moderate, and  $<0.40$  = poor (22).

Involvement in decision making is increasing one's authority and responsibility over the resources and decisions that affect one's life. Involvement in interaction is women's involvement through communication and sharing information with others. Involvement in control over is the exercise of women's real choice and gaining increased control over on their matters.

**Ethics:** The study was approved by the Ethics Committee of Tehran University of Medical Sciences (Ethical code: IR.TUMS.SPH.REC.139501435). The purpose of the study was informed to participants and written informed consent was obtained. Confidentiality was assured by informin that the information recorded was used for research purposes only and that no personal details would be recorded or produced on any documentation related to the study.

## RESULTS

Five hundred forty-nine respondents participated in the study with the overall response rate of 100%. The mean age was  $31 \pm 5.2$  ranging from 25 to 35. Accordingly, the majority of reviewers identified general shape of the questionnaire as organized, well-arranged and easy for clarity and ease of understanding (Table 1).

Table 1: Health-related characteristics among study participants among Iranian reproductive age women from 2016-2017 (n= 549)

Variables	Options	Number(%)
Age in years	<25	93 (16.9)
	25-35	291 (53.0)
	$\geq 35$	165 (30.1)
Employment	Public employee	85 (15.5)
	Private employee	75 (13.7)
	Household	389 (70.8)
Level of education	Up to diploma	98 (17.8)
	Diploma and higher	451 (82.2)
Marital status	Married	526 (95.8)
	Unmarried	23 (4.2)
Frequency of receiving health care services (months)	<2	131 (23.9)
	2-6	262 (47.7)
	>6	156 (28.4)
Past Medical History	Yes	37 (6.7)
	No	532 (93.3)

The internal consistency of the questionnaire was examined through determination of the Cronbach's alpha value, inter-correlation between the scales, and the half split technique. The Cronbach's alpha value for the entire questionnaire was 0.70 (0.62 to 0.76). Spearman correlation coefficient was used to demonstrate the reliability of item domains such as "involvement in decisions (items 8,9,10)", "involvement in interaction (items 4,5,6,7)" and "degree of control (items 1,2,3)" and their Cronbach's  $\alpha$  were 0.62, 0.71 and 0.76 respectively.

The Bartle's test of 10 items ( $c^2=0.79$ ;  $df=45$ ;  $p<0.001$ ) indicated that the inter-item correlation

was sufficient. The KMO measured that the sampling adequacy was 0.79;  $p<0.001$ . EFA was performed with Varimax rotation matrix, which extracted three factors and explained 63.2% of the total variance. The first factor named "*Degree of control items*" consisted of three questions. This factor explained 35.0% of the bulk of variability of the original data. The second factor called "*Involvement in interaction*" comprised four questions. The third factor, "*Involvement in decisions*", consisted of three questions. The percentage of variability in the data interpretation was 12.3% (Table 2, Table 3, Table 4).

Table 2: Descriptive statistics of HCEQ-10/PV and its subscales among Iranian reproductive age women from 2016-2017 (n= 549)

Domain	Number of items	Means $\pm$ SD	Eigen Value	Variance (%)
Degree of control items	3	44.17 $\pm$ 20.11	3.50	35.08
Involvement in interaction	4	44.79 $\pm$ 17.35	1.62	16.22
Involvement in decisions	3	51.45 $\pm$ 18.61	1.23	12.32

Table 3: Item analysis and reliability of the HCEQ-10/PV after back translation among Iranian reproductive age women from 2016-2017 (n= 549)

Subscales	items	Mean $\pm$ SD	Cronbach $\alpha$	ICC
Degree of control item	1	8.08 $\pm$ 3.90	0.766	0.766
	2	7.52 $\pm$ 3.50		
	3	7.28 $\pm$ 3.55		
Involvement in interaction	4	7.62 $\pm$ 3.71	0.716	0.716
	5	7.50 $\pm$ 3.38		
	6	7.82 $\pm$ 3.46		
	7	7.94 $\pm$ 3.61		
Involvement in decisions	8	9.16 $\pm$ 3.36	0.622	0.622
	9	8.74 $\pm$ 3.88		
	10	8.26 $\pm$ 3.84		

## DISCUSSION

This study tried to evaluate important components of psychometric properties (validity and reliability) of healthcare empowerment questionnaires among women. In the study, the translation of the HCEQ-10/PV had no problems with conveying intended meanings of words. Generally, the Persian wording in the translated HCEQ was clear, unambiguous, and easy to understand.

In this study, with regard to reliability analysis, a Cronbach alpha value of  $<0.70$  indicates low correlation among items. The Persian version had a Cronbach alpha of 0.70 (0.62–0.76). These findings are quite similar with and sometimes better than those of previous studies (16). The good internal consistency indicates that the HCEQ-10/PV items measure the same concepts of healthcare empowerment. Furthermore, the high alpha value for the HCEQ-10/PV factors indicated the good internal consistency of the instrument (17).

Table 4: Shows exploratory factors and explained variance after rotation for HCQE-10/PV among Iranian reproductive age women from 2016-2017 (n= 549).

Subscales	Number of items	Factors		
		1	2	3
Degree of control items	2	0.829		
	1	0.806		
	3	0.731		
Involvement in interaction	6		0.831	
	7		0.823	
	5		0.787	
	4		0.572	
Involvement in decisions	10			0.827
	9			0.780
	8			0.567
Eigen Value	-	3.50	1.62	1.23
Variance	-	35.08	16.22	12.32

In this study, the half-split technique showed a high correlation as measured by ICC which exceeded 0.70. Correlation between factors showed positivity with all domains. It is important to note that, "degree of control items" domain had greater Eigen value than the others which were the same with the original scale. The lowest Cronbach  $\alpha$  was calculated in "involvement in decisions" domain. This can be related to introversion, low educational status and skills level, traditional beliefs and women dependency in receiving healthcare. Therefore, the application of this questionnaire for women health research by is far important to measure psychological viewpoints in behavior modification as it has been highly recommended by numerous researchers (22-26). Furthermore, the questionnaire was found to cover a wide continuum from individual empowerment to social empowerment by the focus on individual ability to gain access to, understand and use information from personal healthcare to maintain good health (16). Similarly, this study revealed the importance of Persian version of the questionnaire among women to measure individual's ability to make the best decision regarding healthcare services in healthcare settings, having efficient interaction with healthcare providers and select better healthcare choices. This study remarked that using this questionnaire is easy, and its generalizability depends on sample size and study population characteristics. In conclusion, the Persian version of the HCEQ shows good reliability as well as face validity, and content validity. The analysis of construct validity through EFA presented a satisfactory model. Our study also confirmed that HCEQ-10/PV in the determination of healthcare empowerment score

and related domains to provide relevant educational materials are more appropriate and timely needed. Setting suitable health promotion intervention programs among women in reproductive age is a future research intention.

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