

# Design and Psychometric Evaluation of Mothers' Perception of Postpartum Care in Comprehensive Health Centers

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## Research

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## Abstract

**Background:** In order to properly evaluate postpartum services in comprehensive health centers, encouraging women to use these services and presence of a reliable and valid tool, is necessary to design and assess mothers' perceptions of postpartum care.

**Aim:** Designed to evaluate the psychometric dimensions of Iranian version of Mothers' Perception of Postpartum Health care Questionnaire at Comprehensive Health Centers.

**Methods:** This is a cross-sectional study. The verbatim translation was used to translate the questionnaire from English to Persian. Face, content, and structural validity as well as reliability of the questionnaire were evaluated.

**Findings:** The results showed that the face, content, and structure validity as well as reliability of this questionnaire to be appropriate. The calculated Cronbach's alpha coefficient for the whole questionnaire was 0.668. Interclass correlation coefficient was 0.688, which confirmed divergent validity.

**Conclusion:** Mothers' Perception of Postpartum Health care Questionnaire at Comprehensive Health Centers is a valid and reliable questionnaire to measure mothers' perceptions of these vital services.

## Plain English Summary

Postpartum care is an essential component of women's reproductive health. Women reported negative experiences with postnatal care in health center, and no valid tool for measure mothers' perception of postpartum care. The questionnaires available to measure mothers' perceptions of postpartum care are all designed and used to evaluate postpartum care in the hospital. Considering the physical, psychological, emotional and social Complications, of dysfunctional postpartum care, a valid and reliable tool is needed to assess mothers' perception of health care and encourage them to use existing care services. Present questionnaire is valid and reliable tool for assess Postpartum Care in Comprehensive Health Centers would help management care teams to better assess their mother's satisfaction and make the necessary changes to meet their clients' needs.

## Introduction

Postpartum care is an essential component of women's reproductive health(1). An important part of this care is provided after discharge from hospital or home birth, in comprehensive health centers and by health care providers, especially midwives(2). Mothers' perception of the quality and quantity of the care that they have received as well as their relationship with health care staff have a significant impact on the continuity of care and their subsequent future referrals to receive care (3). Every woman referred to a health care center has the right to compassionate care, which includes dignity, respect for their independence and feelings, and respect for their cultural and family preferences(1) (1).

## Background

There have been numerous reports from around the world of unfair, distant, and disrespectful care during pregnancy and later in the health centers(4). Mothers' satisfaction with postpartum care closely depends on how health care providers treat them(2). Unsatisfying experience and a negative understanding of the health care is an important obstacle to access health care (5). Some studies have examined women's negative experiences with care provided during and after pregnancy(6, 7). Unacceptable behavior and misconduct in managed care and the disruption in communication between the mothers and nurses are the major challenges of prenatal care and after care, especially in developing countries, to which many maternal mortality is attributed(8). Appropriate and reliable tools must be used for accurate measurement of any study subject(9). The questionnaires available to measure mothers' perceptions of postpartum care are all designed

and used to evaluate postpartum nursing care in the hospital only(2, 5, 10); whereas, most of postpartum and child care is provided at health centers. Patient-centered reproductive care has been recognized as an important factor in improving overall reproductive health. However, the number of studies on how to implement it is very limited(11). A valid and reliable tool is needed to assess mothers' perception of health care and encourage them to use existing care services. In addition, such tools would help management care teams to better assess their patients' satisfaction and make the necessary changes to meet their patients' needs(8). In order to properly evaluate postpartum services in comprehensive health centers, encouraging women to use these services and presence of a reliable and valid tool, is necessary to design and assess mothers' perceptions of postpartum care. The overall purpose of this study was to design a tool and assess its validity and reliability to evaluate mothers' perception of postpartum health care.

## Methods

### Study design:

This cross-sectional study was conducted in 2018 to assess the validity and reliability of the Persian version of the psychometric analysis of "Mothers' Perceptions of Care Provided by Postpartum Health Care Workers". Sample size was different (quantitatively and qualitatively) at different stages of this study. To assess the validity and reliability of samples, ten primary health centers providing postpartum care were randomly selected. Out of the women referred to these centers, 250 women were randomly sampled. This study was conducted in Shiraz, southwestern Iran. The face and content validity of the questionnaire were assessed using the opinions of ten academic professors specializing in psychiatry, reproductive health, and comprehensive health staff.

### Data Collection

#### Analysis:

#### Translation

The questionnaire items were originally in English. The questionnaire was translated into Persian by a person fluent in both English and Persian, and then translated back into English by another person fluent in the both languages. In order to validate the questionnaire, another expert (independent of the two individuals) reviewed the translation. Finally, two English and Persian experts compared the questionnaire and confirmed the accuracy of the translation.

#### Validity

The validity of mothers' perception of caregiving questionnaire was presented. This questionnaire is a part of a 100-item questionnaire of Goldberg's Five Factor Model(12), which was improved based on the characteristics of the original questionnaire. Goldberg questionnaire is valid and reliable worldwide. The scale of satisfaction for this questionnaire was based on the scale designed by Hall and co-workers(13). Although the scale was designed for older population, it has been modified by Dimatteo and Hays and is used to assess physicians' satisfaction(14). Because of the nature of the items in these questionnaires and their validity(15), in this study, a part of the questionnaires was selected and psychometrically designed to have a valid and reliable tool for assessing mothers' perceptions of care provided in comprehensive health centers. The mothers' perception questionnaire (MPQ) consists of 18 main items, including participants' satisfaction with caregiver interactions, communication, behavior, and professional competency in educating patient about anxiety management. Additionally, MPQ contains two sub-items including perception of midwifery care in postpartum and postpartum care. This questionnaire was completed and self-reported by the participants within a 3-month postpartum period. Cronbach's alpha of 0.82 was used to determine the internal correlation coefficient of each item. It showed sufficient reliability between items and sub-items. The validity of the MPQ was assessed by evaluating face validity, content validity, and construct validity (exploratory factor confirmation). Quantitative and qualitative methods were used to determine the face validity of the MPQ. To assess the face validity using the qualitative method of Persian version of the MPQ, initially

few employees of the selected health centers and mothers referring to these centers ( $n = 10$ ) commented on the questionnaire. Their views on the appropriateness and clarity of the items were applied to the questionnaire items. It is important to consider the target group's judgment of the relevance and comprehensiveness of the questionnaire items and these items should assess the important areas for the target group(16). Impact score was used to determine quantitative face validity. Comprehensive health center staff and reproductive health professionals ( $n = 10$ ) evaluated the importance of each item using the following formula.  $\text{Impact Score} = \text{Frequency (\%)} \times \text{Importance}$ . A coefficient of 1.5 and above is acceptable (13). At this stage, the importance of each item was measured using the 5-point Likert scale: quite important (5 points), somewhat important (4 points), moderately important (3 points), slightly important (2 points), and not at all important (1 point). The items with an effect size of less than 1.5 score were modified. In addition to the opinion of a number of staff working in comprehensive health centers, the views of the literature experts on the writing, wording, and appearance of the questionnaire items were utilized.

Quantitative method was used to determine the content validity of the MPQ. At this stage, the opinions of some (10 individuals) faculty members who specialized in maternal care and reproductive health were used. Content validity index (CVI) was performed based on Waltz and Basel CVI(17). This index assesses the relevance, clarity, and simplicity of the questionnaire questions on a four-point Likert scale. The CVI score for each phrase was calculated through dividing the number of experts agreeing with the rankings 3 and 4 by the total number of experts. The CVI of greater than 0.79 was considered appropriate(16). Exploratory factor analysis (EFA) was used to determine construct validity. 250 women who referred to comprehensive health centers after childbirth were selected by purposeful sampling. The results were analyzed using SPSS software version 22.0. Reliability shows the reproducibility, and accuracy of the tool(14). The reliability of the Persian version of the MPQ was calculated by determining Cronbach's alpha (determining internal consistency) of the entire questionnaire and its sub-items.

## Results

250 women participated in this study after referral to comprehensive health centers. Their mean age was  $30 \pm 5.54$  years, and most of them were housewives (90.4%, 226 participants). Most of the individuals had planned pregnancy 86% (215 individuals) and used comprehensive health services during and after pregnancy. Table 1 shows the demographic and characteristics of the samples. The impact coefficient of all the items was above 1.5, and the questionnaire had appropriate and acceptable face validity. The minimum acceptable CVI value was 0.79, which was higher than all the items in this questionnaire. The results showed that the CVI of all the items was 1.8–2.5 with scale-level index (S-CVI) of 0.73. The questionnaire items had S-CVI of 0.73 and content validity ratio (CVR) ranged 0.62-1.0. The CVR of questionnaire items ranged between 0.62 and 1.0. The CVR value of the two items was less than 0.62; these items were modified and re-evaluated and after reviewing the CVR values, they reached acceptable level. In order to refine the writing and wording of each phrase, the items were edited by a literary expert. EFA was performed on 250 completed questionnaire. Output results are described below. Kaiser-Meyer-Olkin (KMO) index value at first output was 0.825. Both positive and negative skewness of the data were within acceptable range; thus, the sample size selected was sufficient for factor analysis. According to Bartlett's test, factor analysis was significant for identifying factor model structure at  $P < 0.001$ , indicating detectable relationships among the analyzed variables. The second output of EFA which comprised of two parts, the initial eigenvalue, and the extraction or rotation sums of squared loadings are listed in Table 2. The results of the rotational correlation matrix table showed that a set of 18 items related to the mothers' perception of postpartum care measured two major factors. The first factor consisted of six items with their loading factor ranging from minimum of 0.254 to a maximum of 0.698. The second factor consisted of 12 items that were investigated in three dimensions. The first dimension consisted of seven items with a load factor from minimum of 0.335 to a maximum of 0.835. The second dimension consisted of three items with minimum operational load of 0.612 and maximum of 0.675. Finally, the third dimension consisted of two items with minimum operational load of 0.335 and maximum of 0.637. Chart 1 (see Supplementary Files) descript factor analysis to determine the correlation between items. The first factor had six items and one of the items had a weak correlation

coefficient with the other items and its reliability was low; thus, the item was eliminated by examining research group and Cronbach's alpha reliability coefficient increased from 0.717 to 0.84. These five items have a load factor of 0.578–0.883. The second factor had 12 items and three items were eliminated because of low correlation coefficient. Load factor of these nine items are 0.686–0.853. Load factor for the final 12-question model are listed in Table 3. Estimation of all factor loadings was significant at 0.05. Table 3: Rotated matrix factor analysis of components of mothers' perception questionnaire Internal consistency coefficient was used to determine the internal validity of the questionnaire. The Cronbach's alpha values for each item and the entire questionnaire, after factor analysis, are presented in Table 4. Cronbach's alpha coefficient for the questionnaire was calculated to be 0.668. Intraclass correlation coefficient (ICC) was 0.688 which confirms divergent validity. The cross-correlations of the structures were less than the root mean square of the extracted variances, indicating a divergent validity model. The final results showed sufficient reliability of the questionnaire. Table 4 show Correlation, validity, and homogeneity of perceptions questionnaire.

Table 1  
Demographic and characteristics of the study participants

Demographic description	Characteristic	Number of participants	Percentage (%)
Age	Minimum 18 years old	3	1.2
	Maximum 46 years old	2	0.8
Job	Housewife	226	90.4
	Government employee	23	9.2
	Worker	1	0.4
Spouse employment	Self-employed	129	65.9
	Government employee	57	22.8
	Laborer	29	11.6
Education	Illiterate	4	1.6
	Up to high school	62	24.8
	Bachelor's degree	175	70
	Masters or above	9	30.6
Spouse education	Illiterate	5	2
	Up to high school	62	24.8
	Bachelor's degree	167	66.8
	Masters or above	16	6.4
Pregnancy	Planned	215	86
	Unplanned	34	13.6
Delivery method	Normal delivery	111	44.4
	Cesarean section	138	55.2
	Assisted	1	4
Infant count	Single	246	98.4
	Twin	4	1.6
Pregnancy duration	Under 37 weeks	41	16.4
	Above 37 weeks	209	83.6
Delivery location	Health center	148	59.2
	Gynecologist clinic	98	39.2
	Others	4	1.6
Center for health care post delivery	Health center	201	80.4
	Gynecologist	43	17.2
	Others	24	6

Table 2  
Primary and extractive sharing of exploratory factor analysis of mothers' perceptions of postpartum care

<b>Total Variance Explained</b>									
Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.174	28.747	28.747	5.174	28.747	28.747	3.643	20.237	20.237
2	1.981	11.006	39.753	1.981	11.006	39.753	3.202	17.791	38.028
3	1.910	10.614	50.367	1.910	10.614	50.367	2.166	12.032	50.060
4	1.112	6.176	56.543	1.112	6.176	56.543	1.167	6.482	56.543
5	0.983	5.462	62.005						
6	0.930	5.167	67.172						
7	0.891	4.952	72.124						
8	0.775	4.308	76.432						
9	0.672	3.736	80.168						
10	0.567	3.149	83.317						
11	0.527	2.929	86.246						
12	0.465	2.585	88.831						
13	0.427	2.371	91.203						
14	0.404	2.245	93.447						
15	0.396	2.200	95.648						
16	0.322	1.788	97.436						
17	0.256	1.424	98.860						
18	0.205	1.140	100.000						

Table 3  
Rotated matrix factor analysis of components of mothers' perception questionnaire

<b>Maternal perception questionnaire in the postpartum period</b>	<b>Load factor</b>
Factor one: mothers' perception in post-delivery by midwives' period	
1. Did you get enough psychological support?	0.824
2. Did you receive the necessary information from the staff?	0.883
3. Did you participate in meeting and communicating with your midwife?	0.812
4. Did you feel comfortable talking to your midwife about your problems?	0.805
5. Have you received enough education about taking care of yourself and your baby after delivery?	0.578
Factor two: Understanding postpartum care	
First dimension: Positive understanding of care	
6. I am completely satisfied with the care received.	0.68
7. The time spent with the health staff was adequate.	0.626
8. The health staff thoroughly and reasonably explained all the care, medications, and work they did for me.	0.634
9. The health workers listened carefully to what I was saying.	0.708
10. Health workers were providing care for me with the utmost respect.	0.732
11. The health workers were kind and attentive to my feelings	0.628
12. The health care that I received eliminated all the uncertainty and worry.	0.798
Second dimension: Negative perception of care	
13. I think the time spent with the health staff was not adequate.	0.675
14. I had some doubts about the ability of the health workers.	0.66
15. I feel that in some aspects the health workers were not paying enough attention to me.	0.612
Third dimension:	
16. There were some areas in the care I received that could have been better.	0.842
17. I noticed some health care staff were arrogant.	0.433

Table 4  
Correlation, validity, and homogeneity of perceptions questionnaire

<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>Intraclass Correlation</b>	<b>95% Confidence Interval</b>	<b>Number of Questions</b>
<b>Factor one</b>	0.690	0.680	0.614–0.738	5
<b>Factor two (first dimension)</b>	0.740	0.737	0.684–0.784	7
<b>Second dimension</b>	0.758	0.757	0.699–0.805	3
<b>Third dimension</b>	0.162	0.144	0.098–0.332	2

## Discussion

This study evaluated the psychometric properties of mothers' perception of postpartum care in comprehensive health centers in Iran. The validity and reliability of each questionnaire tool ensure its accuracy and precision. Based on the findings of this study, the MPQ has appropriate face, content, and construct validity. Load factor of all items in the questionnaire was significant at  $\alpha = 0.05$ . Given that this questionnaire was designed and validated for the first time, no similar study was found. All other published studies have evaluated psychiatric satisfaction, perception, or misconduct in postpartum care in hospitals. All items in this questionnaire have impact coefficient above 1.5, CVI above 0.79, and the questionnaire has face and content validity. The study by Taavoni and colleague aimed to design and test a Respectful Maternity Care Questionnaire. The results of their study showed that all items had impact coefficient above 1.5 and the CVR of the questionnaire was 0.74, which was acceptable(6). Their results were similar to the current study. The CVI, CVR and S-CVR were all acceptable items for the MPQ. Study by Sheferaw and co-workers in Ethiopia to validate 15-item questionnaire that assessed the mothers' perception of respectful prenatal care in health centers showed that the items in the questionnaire had construct validity of 0.76 to 0.82, and the entire questionnaire had acceptable construct validity, findings of this study confirmed the structural validity of the two factors of perception of midwifery care in postpartum and postpartum care (11). The study published by Afulani and others aimed to develop a person-based maternal care assessment tool. This questionnaire have four factors and 38 items. EFA findings confirmed the validity of 30 items in three factors for urban and rural communities (18). Confirmatory factor analysis of the study by Taavoni and colleague revealed that the Respectful Maternity Care Questionnaire related to mothers' satisfaction with postpartum nursing care had a good relationship between items and acceptable value(6). This research is close to the present research, but since the questionnaire has already been available in some languages, including English and has been validated, confirmatory factor analysis was used. Cronbach's alpha for the questionnaire is 0.668, and the internal consistency and reliability of this questionnaire is quite appropriate and demonstrates its reliability at a large level. In Afulani and co-workers' study, Cronbach's alpha was 0.8, and all factors had satisfactory value for reliability and applicability(18). Overall, the modified 12 main items and two sub-item questionnaire of mothers' perception of postpartum care in comprehensive health centers is a valid and reliable questionnaire to measure mothers' perceptions of these vital and useful services.

## Conclusion

This questionnaire can be used to identify the strengths and weaknesses of the care provided by midwives and health care providers. There have been many studies conducted on mothers' satisfaction, mothers' perception, and malnutrition in prenatal or post-natal care in different hospitals around the world, leading to the development of reliable and valid tools, especially in developing countries where health care is poorer. This has led to the design or confirmation of the validity and reliability of these tools(8, 10), offering essential assets to managed care teams and health care providers.

## Declarations

### Ethics approval and consent to participate

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran (No. IR.SUMS.REC.1397.522). All the participants were informed about the study objectives and signed written informed consents for taking part in the study.

### Consent for publication

All presentations of this study must have consent for publication.

## Availability of data and materials

Data available by Corresponding author by request

## Competing interests

The authors declare that they have no competing interests.

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## Authors' contributions

Fatemeh Vizeshfara&Azadeh Pakniat: Conceptualization, Methodology, Software, Data curation, Writing- Original draft preparation, Visualization, Investigation, Supervision, Validation, Writing- Reviewing and Editing. Maryam Ahmadinezhad: Conceptualization, Methodology, Investigation, Supervision.

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## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Chart1.pdf](#)