Psychometric Evaluation of Persian Version of Quality of Prenatal Care Questionnaire

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Abstract

Background: Because of the impact of prenatal care on the health of mothers and children, improving the quality of prenatal care is necessary. Improving the quality of care is not possible without users' comments. The purpose of this study was, then, to evaluate the psychometrics of the Quality of Prenatal Care Questionnaire (QPCQ) among Iranian mothers.

Materials and Methods: The participants of this descriptive study comprised of 300 postpartum women, who were selected by convenience sampling method. After obtaining approval from the original tool designer, all of the participants were asked to complete the Persian version of QPCQ to achieve its construct validity. Confirmatory Factor Analysis (CFA) was computed to determine the construct validity, and Cronbach's alpha coefficient was calculated to determine the reliability and internal consistency; test-retest method was also performed to evaluate the repeatability using intra-class correlation coefficient (ICC).

Results: In the CFA test, the data had an acceptable fit (RMSEA = 0.048, CFI = 0.903, and IFI = 0.904). Cronbach's alpha coefficient and ICC of the whole questionnaire were 0.883 and 0.822, respectively, which approved the reliability and stability of the Persian version of the instrument.

Conclusion: The study findings demonstrated that the Persian version of QPCQ enjoys satisfactory validity and reliability indices, which can be used as a suitable tool to assess and reveal the quality of prenatal care in Iran, in order to develop appropriate interventions in attenuated care.

Key Words: Prenatal care, Quality, Reliability, Validity

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1- INTRODUCTION

Although infant mortality has been declining since 1990, there are still 2.5 million infant deaths around the world each year (1). The approximate number of 2 million prenatal deaths is really significant (2). Neonatal mortality and its general outcomes such as stillbirth, preterm birth, and low birth weight are important issues in the health system. It is, then, important to reduce the factors affecting such outcomes. Many adverse neonatal outcomes may stem from neglect or lack of attention to prenatal care, so that the prenatal care is the most effective factor in improving pregnancy outcomes. Hence, such care can considerably prevent adverse neonatal outcomes (3-7).

Prenatal care is a comprehensive and systematic care program that includes medical, psychological and social care of the pregnant mother; it begins before pregnancy and continues throughout pregnancy (8). The importance and role of prenatal care in high-risk pregnancies is more significant, especially since about 15-20% of pregnancies become high-risk (9, 10). The high-risk pregnancies include symptoms of hypertension, diabetes, anemia, blood incompatibilities ,and thyroid diseases, which are diagnosed by prenatal visits (11-16).

Diagnosis of high-risk pregnancies is the first step in preventing fetal and neonatal injury, which reduces subsequent neonatal outcomes, if performed during prenatal visits. In other words, high-quality and efficient care leads to early detection of high-risk women during care and the provision of solutions (14).

The prenatal care has two dimensions, quantity and quality. The quantity of care means the number of prenatal care performed according to gestational age and onset of first care (17). The quality of care refers to judging or evaluating the various dimensions of a service (18, 19). The quality of care is more important, as it strongly influences the outcomes (20). Neonatal survival rates can be increased by focusing on high-quality prenatal care, since poor care is associated with improved premature birth, low birth weight, and neonatal death (3, 6, 20).

If the prenatal care is of good quality, it can have a positive effect on improving neonatal outcomes and ultimately child outcomes; and vice versa, inefficient and poor quality care, in addition to failing to promote neonatal health and health indicators, causes loss of healthcare costs (21, 22). According to a study, the infant mortality was lower in women who received information about possible pregnancy complications during prenatal care, as well as blood pressure tests and tetanus vaccine injections. Moreover, various studies have reported an effective relationship between the quality of prenatal care and birth weight (22-25).

The services should be evaluated and monitored to improve the quality of care. Some indicators of prenatal care assessment include the Kessner Index (KI) and the Adequate Prenatal Care Utilization (APNCU); these indicators measure quantity, not quality (26).

The Donabedian model is widely used to assess healthcare quality. In this model, the service evaluation is based on structure, process, and outcome. According to the Donabedian model, the appropriate structure and process in the service quality assessment path leads to the desired outcome. The structural level includes material and human resources and organizational structure. Technical performance and interpersonal interaction are components of the process (27-29).

Although the Donabedian model is also used to assess the quality of prenatal care, it is not specific to pregnancy and is not considered a specific measurement tool for prenatal care. Since there is no single

standard tool for measuring the quality of prenatal care, studies have used different tools for prenatal care monitoring; and, thus, it is difficult to compare the results of measurements with each other (30-34).

The Quality of Prenatal Care Questionnaire (QPCQ) is a tool designed according to Donabedian structures and existing guidelines for prenatal care. The QPCQ scale was developed by Maureen Heaman et al. (2014) in Canada and has been translated into many languages (35). The guidelines included in the design of the QPCQ were adapted from the World Health Organization, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists, the National Institute for Health and Clinical Excellence, the Public Health Agency of Canada, the Society of Obstetricians and Gynaecologists of Canada (SOGC), Association the American College of Obstetricians and Gynecologists, and the American Academy of Pediatrics (35). The QPCQ has also been translated into Persian, but its validity and reliability have not been evaluated in Iran. As mentioned, the quality of prenatal care has an effective relationship with the neonatal health. Accordingly, measuring the quality of prenatal care is effective in improving the outcomes. The researchers in this study, hence, decided to evaluate the psychometric properties of the Persian version of QPCQ in this community in order to provide a valid tool available to caregivers, especially managers, by which the quality of prenatal care can be easily measured and revealed; and in consequence appropriate interventions in impaired care can be implemented.

2- MATERIALS AND METHODS

2-1. Study design and population

The present descriptive study was conducted to investigate the psychometric properties of the Persian version of QPCQ. The research units were selected by Convenience sampling method in 2018 in Tonekabon County, Mazandaran Province, northern Iran. The statistical population of this study consisted of all married women in Tonekabon who had recently given birth. The sample size was estimated at 300 people, 5-10-sample per item (36, 37).

2-2. Measuring tools

Data collection tools in this study included the questionnaires of demographic characteristics (age, occupation, educational level, residence, number of pregnancies and insurance status) and the QPCQ. The QPCQ contains 46 items (questions) and 6 factors including information sharing, anticipatory guidance, sufficient time, approachability, availability, support, and respect. The QPCQ questions are answered on the basis of a 5-point Likert scale (strongly disagree; disagree; neither agree nor disagree; agree; strongly agree), and respondents express their views on the prenatal care received. For the QPCQ items, scores of 1 to 5 are respectively considered equivalent to strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree, with the exception of items 8, 15, 23, 28 and 40, in which the score is 5 for strongly disagree, 4 for disagree, 3 for neither disagree nor agree, 2 for agree and 1 for strongly agree. The score of each factor is calculated in such a way that the obtained scores are added together and divided by the number of items forming that factor. The total score is obtained by summing the scores of all factors and dividing by 46 (35).

2-3. Ethical considerations

The research plan was approved at the Shahid Beheshti University of Medical Sciences with the code of ethics of (IR.SBMU.PHNM.1396.392). Prior to data collection, informed consent were obtained from the participants, while they had received complete explanations about the study objectives, and had been ensured

the confidentiality of information. Written permission was first obtained from the original tool designer by sending an email prior to beginning the psychometric process of the QPCQ, after which the Persian version translated by the original tool designer was provided to the researcher.

2-4. Inclusion and exclusion criteria

The followings are the criteria to be met by the women of the population for being included in the study: having a healthy singleton birth in the past six weeks, being literate, having at least three prenatal visits, absence of mental and speech disorder to communicate with the researcher, and willingness to participate in the study. Unwillingness to continue participating in the study was considered as an exclusion criterion.

2-5. Data Analysis

To determine qualitative face validity, the questionnaire using a convenience sampling method was provided to 20 women who had just given birth and were economically and socially heterogeneous and did not constitute the main samples of the study. They were asked to express their views on the readability, clarity, and comprehensibility of the questions, writing style, and grammar in order to remove any conceptual ambiguity or writing objection.

Cronbach's alpha coefficient was used to determine the reliability and internal consistency of the questionnaire. It should be noted that an instrument will have suitable reliability when the Cronbach's alpha coefficient is greater than or equal to 0.7 (38).

The Temporal stability was tested by the test-retest method with an interval of two weeks. Therefore, the questionnaire was given to 30 women who were the main participants with an interval of two weeks, and the correlation between the scores of the two examinations was determined by the intra-class correlation coefficient (ICC).

This will be the most acceptable index for temporal stability, if it is more than 0.75 (39). At the end of these stages, the QPCQ was completed by 300 eligible women to determine its construct validity.

Confirmatory Factor Analysis (CFA) was used to assess the construct validity of the questionnaire to determine whether the questions intended to introduce the questionnaire agents really represent those factors; and how accurately they were introduced. In addition, the goodness of model fit was determined using fitness indexes, including the area covered by chi-square (x^2), relative chi-square $(x^2 \mid df)$, incremental fit index (IFI) and comparative fit index (CFI).

In this study, data were analyzed by SPSS version 23 and AMOS version 25 softwares using descriptive (to calculate the frequency and percentage of demographic characteristics of the samples) and inferential statistics.

3- RESULTS

The age range of participants in this study was 15-46 years. Table 1 shows the demographic characteristics of the research units. The mean and standard deviation of the total score of prenatal care quality in this study was 3.56 ± 0.32, which indicates the moderate quality of prenatal care presented in Tonekabon.

Table-1: Demographic characteristics of the samples

Demographic characteristics	Variables	percent
Age	Less than 18 years	2/7
	18-35 years	82/3
	More than 35 years	15
Occupation	Housewife	88/3
	Employee	11/7
Educational level	Illiterate	0/7
	Primary school	7/7
	Secondary school	11/3
	High school	6
	Diploma	42/7
	Associate degree	3/3
	Bachelor's degree and higher	28/3
Residence	Village	43
	City	57
Number of pregnancies	1	58
	2	29/3
	3	11
	4 and more	1/7
Insurance status	Having	96/3
	Not having	3/7

Moreover, the mean score of QPCQ sub-factors was in the range of 3.28 to 3.86 out of 5 points. The highest mean was related to the sub-factor of sufficient time, and the lowest mean was related to the sub-factor of anticipatory guidance. The mean and standard deviation of the scores of each of the QPCQ sub-factors are shown in Table 2.

Table-2: The mean and standard deviation of the score of each of the QPCQ sub-factors

Factors	Mean (SD)	Maximum	Minimum
Information sharing	3/71(0/66)	5	1/1
Anticipatory guidance	3/28(0/60)	4/54	1/09
Sufficient time	3/86(0/62)	5	1/2
Approachability	3/67(0/76)	5	1/75
Availability	3/52(0/77)	5	1/4
Support and respect	3/85(0/53)	4/91	1/58
Total QPCQ	3/56(0/32)	4/36	2/36

The CFA results showed a correlation between an item and the corresponding sub-factor through factor loading. As a contract, if the factor loading is less than 0.3, the correlation between the factor and the item is considered to be weak and it is better to delete the item, because it cannot explain the variable well (40).In the present study, the factor loading of all items of the Persian version of QPCQ using CFA was obtained to be over 0.3 (Table 3).

Table-3: Factor loads of QPCQ

Items	Information sharing
I was given adequate information about prenatal tests and procedures	0/716
I was always given honest answers to my questions	0/712
Everyone involved in my prenatal care received the important information about me	0/743
I was screened adequately for potential problems with my pregnancy	0/760
The results of tests were explained to me in a way I could understand	0/747
My prenatal care provider(s) gave straightforward answers to my questions	0/736
My prenatal care provider(s) gave me enough information to make decisions for myself	0/663
My prenatal care provider(s) kept my information confidential	0/704
I fully understood the reasons for blood work and other tests my prenatal care provider(s) ordered for me	0/696
Items	**Anticipatory Guidance**
My prenatal care provider(s) gave me options for my birth experience	0/614
I was given enough information to meet my needs about breast-feeding	0/660
My prenatal care provider(s) prepared me for my birth experience	0/753
My prenatal care provider(s) spent time talking with me about my expectations for labor and delivery	0/669

Items	
I was given enough information about the safety of moderate exercise during pregnancy	0/611
I received adequate information about my diet during pregnancy	0/788
My prenatal care provider(s) was interested in how my pregnancy was affecting my life	0/763
I was linked to programs in the community that were helpful to me	0/556
I received adequate information about alcohol use during pregnancy	0/593
I was given adequate information about depression in pregnancy	0/617
My prenatal care provider(s) took time to ask about things that were important to me	0/760
Items	**Sufficient Time**
I had as much time with my prenatal care provider(s) as I needed	0/765
My prenatal care provider(s) was rushed	0/750
My prenatal care provider(s) always had time to answer my questions	0/741
My prenatal care provider(s) made time for me to talk	0/704
My prenatal care provider(s) took time to listen	0/766
Items	**Approachability**
My prenatal care provider(s) was abrupt with me	0/699
I was rushed during my prenatal care visits	0/717
My prenatal care provider(s) made me feel like I was wasting their time	0/746
I was afraid to ask my prenatal care provider(s) questions	0/747
Items	**Availability**
I knew how to get in touch with my prenatal care provider(s)	0/726
Someone in my prenatal care provider(s)'s office always returned my calls	0/652
My prenatal care provider(s) was available when I had questions or concerns	0/769
I could always reach someone in the office/clinic if I needed something	0/818
I could reach my prenatal care provider(s) by phone when necessary	0/849
Items	**Support and Respect**
My prenatal care provider(s) respected me	0/668
My prenatal care provider(s) respected my knowledge and experience	0/656
My decisions were respected by my prenatal care provider(s)	0/733
My prenatal care provider(s) was patient	0/644
I was supported by my prenatal care provider(s) in doing what I felt was right for me	0/691
My prenatal care provider(s) supported me	0/803
My prenatal care provider(s) paid close attention when I was speaking	0/758
My concerns were taken seriously	0/681
I was in control of the decisions being made about my prenatal care	0/578
My prenatal care provider(s) supported my decisions	0/710
I was at ease with my prenatal care provider(s)	0/624
My values and beliefs were respected by my prenatal care provider(s)	0/566

 The results of CFA with the aid of model fit indexes generally showed that the data of the present study are sufficiently fit (CMIN/DF =1.697, RMSEA = 0.048, CFI = 0.903, and IFI = 0. 904). the final construction of the model is shown in Figure 1.

Figure-1: The final construction of the QPCQ model
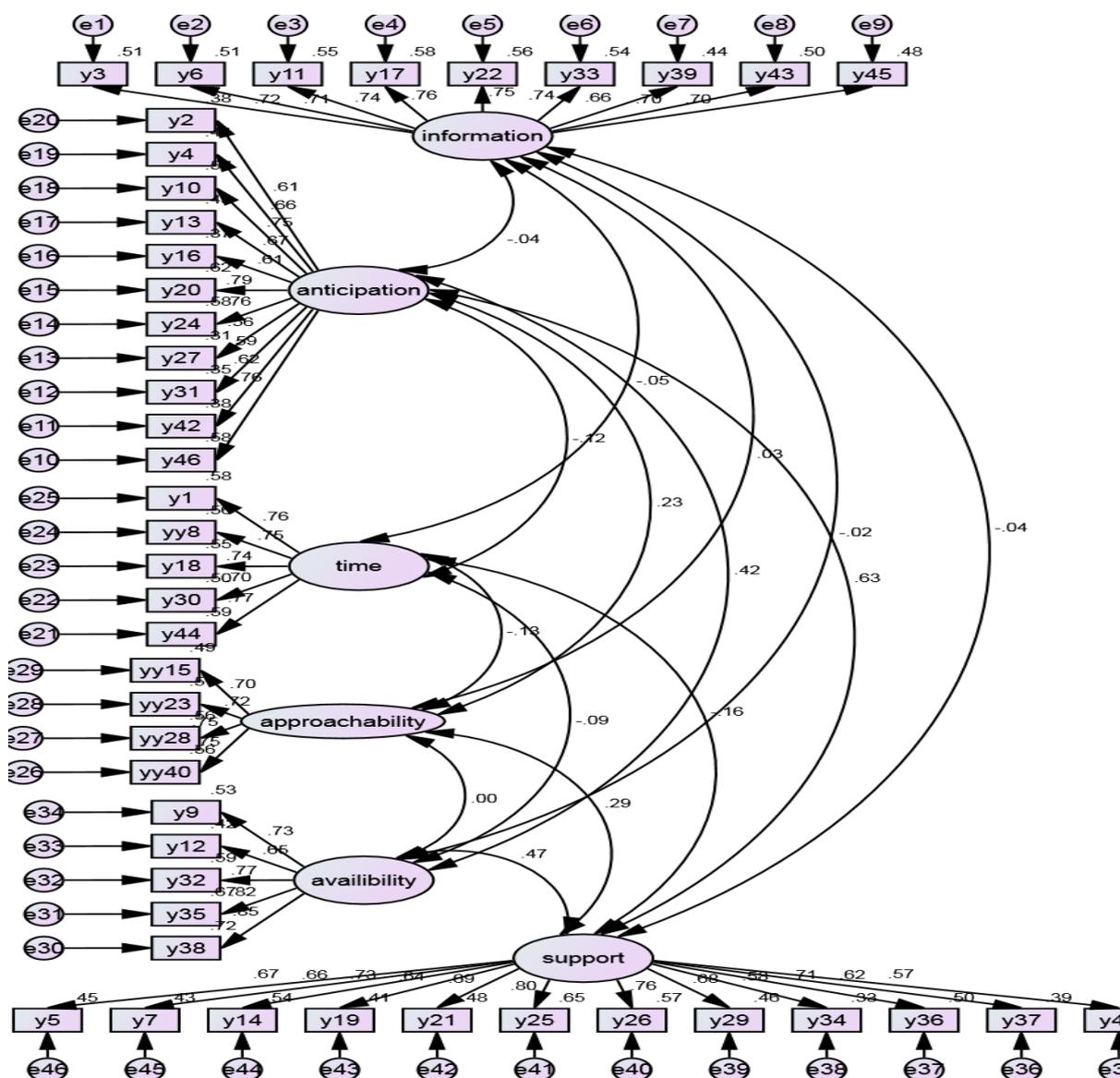
In determining the reliability of QPCQ, the Cronbach's alpha coefficient for all items was found to be 0.883 and for the information sharing factor, anticipatory guidance, sufficient time, approachability, availability and support and respect, respectively 0.906, 0.899, 0.761, 0.818, 0.827, 0.907 were obtained and the total ICC was 0.822 that was optimal (Table 4).

Table-4: The reliability of the QPCQ

Factors	Items	Cronbach's alpha	ICC	P
Information sharing	3,6,11,17,22,33,39,43,45	0/906	0/927	0/000
Anticipatory guidance	2,4,10,13,16,20,24,27,31,42,46	0/899	0/868	0/000
Sufficient time	1,8,18,30,44	0/761	0/802	0/000
Approachability	15,23,28,40	0/818	0/751	0/000
Availability	12,35,32,38,9	0/827	0/844	0/000
Support and respect	5,7,14,19,21,25,26,29,34,37,41,36	0/907	0/759	0/000
Total QPCQ	1-46	0/883	0/822	0/000

4- DISCUSSION

The QPCQ is the first tool that comprehensively measures the quality of prenatal care and pays attention to the structure, technical performance, and interpersonal interaction in prenatal care. The original version of this questionnaire was designed in Canada (35) and was assessed for psychometrics among samples of Australian (2015) and French (2015) postpartum women living in Canada. The Brazilian version of this questionnaire was also reviewed for psychometrics by Nunes et al. in 2019 (41-43).

The psychometric results of the present study support the high level of validity and reliability of the Persian version of QPCQ. To determine the reliability in this study, the Cronbach's alpha coefficient for the whole instrument was found to be 0.883 and its range for each factor was between 0.761 and 0.907, which was over 0.7 similar to the Cronbach's alpha coefficient in the psychometric evaluation of the original Canadian version of the questionnaire (0.96), which is an acceptable value (35, 38). In the Australian, French, and Brazilian versions,

the Cronbach's alpha coefficient was over the acceptable value, with a Cronbach's alpha coefficient of 0.97 in all three versions, which were consistent in this respect (41-43).

The ICC had been used to measure the stability of the questionnaire. In the present study, the ICC was 0.822, which was close to the original version (0.88), consistent in this respect (35). The ICC was also mentioned in the Brazilian version but is higher than in the present article (0.995), which may be related to the difference in the interval of repeatability in completing the questionnaires (43).

In this study, CFA verified and confirmed the presence of six factors. Various fitness indices were applied in the CFA results to assess the factor fitness.

However, the use of CFI is less affected by the number of samples in the study. The CFI is usually between 0 and 1, and the values greater than 0.9 indicate a good fit. In our study, the value of this index was 0.903, which was better compared to the Australian version (0.884). The value of RMSEA index reported in the French version was 0.06 and in the present study was 0.048. Comparison of the two studies shows that the RMSEA index of this study was better than its value in the French version (41, 42).

The mean and standard deviation of total prenatal care quality score in the present study was 3.56 ± 0.32, which was lower than that reported in the similar studies in Australia (4.11 ± 0.55) and France (4.41 ± 0.45) (41, 42).

Analyzing the results of the dimensions of quality of care, it seems that the anticipatory guidance has a lower score than other factors, which can indicate the weakness of caregivers' counseling with pregnant mothers. In a study by Simbar et al., to evaluate the quality of prenatal care, the status of counseling for pregnant mothers was not favorable (31). Therefore, in order to strengthen the quality of prenatal care and increase the satisfaction of clients in Iran, it is better to pay more attention to counseling and training in prenatal visits and to be monitored and evaluated by managers to improve the quality of care.

One of the strengths of this study is the psychometric evaluation of a comprehensive tool for quality control of prenatal care for the first time in Iran. Spatial constraint is one of the limitations of the present study, which made it difficult to generalize the results to all Iranian pregnant mothers. In order to ensure psychometrics, the tool needs to be examined in more diverse environments. Therefore, it is suggested that its validity and reliability should be examined in different cities.

5- CONCLUSION

The results of the present study showed that the Persian version of the Quality of Prenatal Care Questionnaire has an acceptable confirmatory factor analysis confirming the valid and reliable tool used to assess the quality of prenatal care in Iran.

6-ACKNOWLEDGMENTS

7- CONFLICT OF INTEREST: None.

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