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Development and Psychometric Properties of Pregnant Women's Decision-making Questionnaire for Choosing a Prenatal Care Provider (CPCP-60): A Research From Southwest of Iran

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Abstract

Background: The selection of a competent prenatal care provider for women is of a major concern. The purpose of this research was to design a questionnaire for pregnant women's decision-making regarding choosing a prenatal care provider and to assess its psychometric properties.

Methods: This study used an exploratory mixed method. In the qualitative phase, a semi-structured individual interview was done with 33 participants in Shiraz, Iran. Based on the outcomes of the previous step and the literature study, the items of the questionnaire were designed in the quantitative phase. Then, the Cosmin criteria were developed to consider the psychometric properties of the questionnaire. In order to examine the validity of the CPCP-60 questionnaire, an exploratory factor analysis was performed. Reliability was assessed by the Cronbach alpha coefficient test and retest. Data were analyzed using the SPSS Version 21.

Results: The CPCP-60 questionnaire included 60 items. After the exploratory factor analysis, 4 factors were extracted that expressed 60.52% of the total variance: professional and communication skills, personal traits of prenatal care providers, and characteristics of pregnancy and childbirth centers. The content validity index and the content validity ratio were 0.90 and 0.76, respectively. A Cronbach alpha of 0.941 and a test-retest of 0.951 demonstrated excellent reliability for the CPCP-60 questionnaire. The responsiveness and the interpretability were acceptable. The minimal detectable change (MDC) of the questionnaire (9.70) was less than the minimal important change (MIC) (12.91).

Conclusion: Considering the reliability and validity of the CPCP-60 questionnaire, and its compatibility to the culture of the Iranian society, it can be used in clinical research to evaluate the decision-making of pregnant women on choosing a competent prenatal care provider in Iran.

Keywords: Decision-Making, Iran, Pregnant Women, Provider, Questionnaire, Validation

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Introduction

One of the most crucial decisions for women is the selection of a care provider for pregnancy (1). Providers of these services play an important role in the protection of mothers and infants' health (2). Pregnant women can

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↑What is "already known" in this topic:
Some researchers have investigated the influencing factors on physician's choice by patients. Decision-making of pregnant women about choosing a prenatal care provider is extremely important but no instrument has ever been designed to assess the decision-making of this group.

→What this article adds:
For the first time, a comprehensive instrument to assess a competent prenatal care provider choice by pregnant women was developed and validated in Iran.

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choose various providers for prenatal care (3). From the date pregnancy and childbirth medicalization in the early 20th century onward, women started to share their pregnancy experiences with professional health care providers (4). According to the World Health Organization, prenatal care providers are physicians and midwives who have received adequate training and are capable of diagnosing the general condition of pregnant women (3). In Canada and the Netherlands, normal pregnant women are cared for by midwives or gynecologists, and high-risk pregnant women are cared for by gynecologists or obstetricians (5). Different combinations of prenatal care models are used in countries such as Australia, New Zealand, Sweden, the United Kingdom, and Ireland (6).

In Iran, midwives, general practitioners, and gynecologists receive the necessary training for providing prenatal care, but midwives and gynecologists undergo more specialized training (7). Moreover, in rural regions of Iran, first-level prenatal services are offered by Behvarzes (public health workers) and high-risk cases are referred to the general practitioners and midwives (8). According to Iranian researches, the majority of pregnant women received prenatal care from gynecologists (9, 10).

Some researchers investigated factors of physician's choice. Harazzi et al discovered that the level of knowledge, dedication of enough time to patient examination, having interest in learning about patient problems, employment of competent staff, not being distracted during visits, and greetings before examinations were the most important factors that were considered for a physician's selection (11). The results of a study in the United States indicated that the variety of factors, including knowledgeability, showing interest in finding out about the patient's complications, allocating sufficient time to examinations, employment of competent assistants, observing financial matters, avoiding time-wasting, and personal characteristics of the physician, were important factors involved in choosing a physician (12).

In Iran, the Patient's Rights Charter has been compiled in accordance with the highest human values, the Islamic-Iranian culture, and the equal inherent dignity of health care receivers to maintain, enhance, and promote the relationship between health care providers and patients. According to this charter, patients' decision-making regarding the selection of providers and health care centers should be informed and based on adequate information (13).

Since pregnant women's decision-making about the choice of the suitable prenatal care provider is a high priority and no protocol has been developed to assess the decision-making of pregnant women in this regard, in the present study attempts are made to fill in this gap and use the experiences of prenatal care providers and pregnant women to design and psychometrically assess an applied instrument to evaluate the decision-making of pregnant women for choosing a prenatal care provider. The aim of this study was to design the decision-making questionnaire of pregnant women for choosing a prenatal care provider and to determine its psychometric properties.

Methods

In the current mixed method exploratory study, at first, the concept of pregnant women's decision-making status regarding the selection of a prenatal care provider was determined using the conventional content analysis method (13, 14). At this stage, concerning the maximum diversity of participants, 23 pregnant women and 10 prenatal care providers were selected through purposeful sampling were subjected to semi-structured and in-depth individual interviews in Shiraz, Iran, during 2018.

In this study, immediately after the finishing the interview, the recorded files were repeatedly reviewed to gain an overall understanding. Then, the interviews and the nonverbal messages were transcribed. Each sentence was extracted from the interviews as a phrase that expressed a semantic unit. Then, categories and themes were extracted. Guba and Lincoln's criteria including credibility, dependability, transferability, and conformability were used to improve the trustworthiness of the qualitative data (14).

Next, the phrases obtained from the interviews and relevant studies were exploited as a platform to formulate questionnaire items. Designing the primary questionnaire items of pregnant women's decision-making status in choosing a prenatal care provider was formulated based on the methodology used by Waltz (13). In the third step, Cosmin criteria (15) were applied to find the reliability and validity of this questionnaire.

Validities

1- Face Validity: qualitative and quantitative approaches were used to find the face validity of the questionnaire. During qualitative face validity, 10 pregnant women were randomly selected for a face-to-face interview. They assessed the difficulty of understanding and the ambiguity in the words and the phrases and their relevancy with the questionnaire dimensions. The questionnaire items were reviewed by the research team. For the quantitative examination, the item impact score (frequency% × importance) was used to eliminate unsuitable items and show the importance of each item. The items with an impact score ≥1.5 were considered appropriate and retained (16).

2- Content Validity: qualitative and quantitative evaluations were used to determine the content validity of the CPCP-60 questionnaire. For qualitative content validity, 10 instrument designers consisting of gynecologists, reproductive health PhDs, and midwives evaluated the questionnaire items based on criteria such as grammar, wording, item allocation, and scaling indices. They inserted their comments into the questionnaire. The content validity index (CVI) and the content validity ratio (CVR) were used for quantitative evaluation of content validity. To evaluate the CVR, 10 experts (different from those used in the previous step) assessed all items based on a three-point scale (unessential, useful but not essential, essential). The CVR of each item was calculated using the CVR formula. The CVI value ≥0.62 was determined to be the cutoff point according to Lawshe table and based on 10 experts' opinions (17). The CVI was performed using Waltz and Bausell's criteria. all items evaluated by 10 experts with a 4-point Likert scale for relevance, clari-

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ty, and simplicity. The CVI was calculated using the CVI formula. The CVI value of ≥0.79 was acceptable for each item (18).

3- Construct Validity: An Exploratory factor analysis (EFA) was used to find the relationships among the variables of the questionnaire in a sample of 300 women. The EFA identified the same variables and extracted underlying factors (19, 20). The correlation between variables was assessed by varimax rotation in principal component analysis. Items with a factor loading of ≥0.3 were acceptable. Also, The Kaisar-Meyer-Olkin (KMO) and Bartlett sphericity tests were used to evaluate the possibility of performing a factor analysis on the collected data. The KMO >0.80 indicated the adequacy of the samples to perform the factor analysis. The chi-square of Bartlett test should be statistically significant (P < .05) (21). Eigenvalues and scree plots >1 were used to find the number of factors (22).

Reliability

The Cronbach alpha coefficient was applied to assess the internal consistency of the questionnaire. The Cronbach alpha coefficient of 0.7 or above was satisfactory for an item that can remain in the instrument (23). To interrogate the stability questionnaire, the test-retest method was conducted. A total of 30 pregnant women completed the questionnaire twice with an interval of 2 weeks. It was suggested a minimum of 2 weeks to reduce the effects of memory (24). The acceptable value of the intraclass correlation coefficient (ICC) was considered 0.7 or above (25, 26).

Responsiveness

The analysis of variance test was used to assess the responsiveness of the questionnaire (15).

Interpretability

Interpretability of the questionnaire was determined by ceiling and floor effects and MDC (15).

Sample Size

The minimum sample size to carry out a factor analysis is 5 to 10 participants per item in line with researchers statement (27). In this study, according to the 60-item questionnaire and 5 samples per item, 300 questionnaires were completed by women who had childbirth in the last 3 days and were willing to participate in the study in Shiraz, Iran, in 2018. The samples were selected by simple sampling. Data were analyzed using SPSS Version 21.

Results

The content analysis of the collected data from interviews and the review of the literature was used to develop a 74-item questionnaire on the 5-point Likert scale (strongly disagree; disagree; no idea; agree; strongly agree) by the research team.

Two items in the face validity and 12 items in content validity, that did not reach the minimum score were excluded, and the final questionnaire (a 60-item questionnaire) was developed. The instrument's total CVI and CVR were 0.90 and 0.76 respectively, indicating that the instrument was valid. For the EFA, 300 questionnaires were completed by the participants whose demographic characteristics are listed in Table 1.

The KMO was 0.850, which represented that sample size was sufficient. Also, the Bartlett test of sphericity (1721.066) was significant (P < 0.001) that justified the implementation of the factor analysis based on the correlation matrix. According to the results of the EAF, 14 factors with Eigenvalues>1 were extracted. Due to the high number of factors extracted from this stage of the factor analysis and in order to interpret the factors more clearly,

Table 1. Characteristics of the Participants

Characteristics		Frequency	Percent
Age (years)			
	<21	15	5.0
	21-30	138	46.0
	31-40	141	47.0
	≥41	6	2.0
Husband's age (years)			
	21	3	.0
	21-30	76	25.3
	31-40	182	60.7
	41-50	36	12.0
	≥51	3	1.0
Education			
	Under the diploma	66	22.0
	Diploma to Bachelor	226	75.3
	Master's degree or higher	8	2.7
Employment status			
	Employed	41	13.7
	housewife	259	86.3
Husband's job			
	Employee	94	31.3
	Self-employed	204	68.0
	Unemployed	2	0.7
Total		300	300

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Table 2. Principle Factor Analysis With Varimax Rotation for the Questionnaire of Pregnant Women's Decision-making for Choosing a Prenatal Care Provider (PCPC-60)

Factor 1: Communication Skills with 20 Statements	
I choose a midwife or a gynecologist as a prenatal care provider who ….	Loadings
Gives me, my spouse, and my companion some training on prenatal care	722
Provides pregnant women with consultation services.	0.720
Replies my questions in simple and easy-to-understand language.	0.418
Refers me to an experienced physician if needed.	0.468
Talks to me in a quiet tone	0.811
Listens to my words carefully.	0.859
Understands my feelings.	0.617
Uses a sincere behavior towards me.	0.665
Provides me with a contact number during pregnancy.	0.650
Is trustworthy.	0.515
Can help me experience a good pregnancy and childbirth.	0.583
Reduces my anxiety regarding pregnancy and childbirth.	0.670
Has a good moral character.	0.724
Is patient.	0.780
Is calm when talking to me.	0.714
Is kind and caring.	0.524
Uses the cesarean section if my fetus or I are in danger.	0.746
Provides me with prenatal care and childbirth.	0.500
Doesn't leave me alone during labor and delivery.	0.607
Give me the right to have others (spouse, family members, and doula) accompany me during childbirth.	0.676
Cronbach's α coefficient	0.929
Test-retest (ICC)	0.839
Explained variance (%)	15.199
Eigenvalues	1.794
Factor 2: Professional Skills with 15 Statements	
I choose a midwife or a gynecologist as a prenatal care provider who ….	Loadings
Asks and records my history of illnesses and medical conditions.	0.696
Carefully examines me.	0.713
Can correctly diagnose my problems and diseases.	0.540
Asks me to have an ultrasound and necessary laboratory tests and carefully check their results.	0.717
Prescribes effective drugs for my disease.	0.750
Explains how I take my medications	0.699
Performs prenatal care regularly and thoroughly.	0.617
Makes quick and timely decisions when it comes to my and my fetus's health.	0.749
Maintains my health and my baby is important for her.	0.656
Follows hygiene principles.	0.616
Has sufficient and up-to-date scientific information.	0.527
Is approved by my relatives and friends.	0.639
Has a clean professional record and is famous.	0.519
Feels responsible towards pregnant women and regularly monitor my health.	0.617
Is highly educated.	0.442
Cronbach's α coefficient	0.842
Test- re-test (ICC)	0.818
Explained variance(%)	17.719
Eigenvalues	5.429

the EFA was repeated and showed 4 factors that accounted for 60.522% of the total variance (Table 2). Also, according to the scree plot, 4 factors were accepted (Fig. 1).

Results exhibited that all of the items had a factor > 0.3, so all the 60 items of questionnaires remained. With the agreement of the research team, the factors were named as follows: communication skills, professional skills, personal traits of prenatal care providers, and characteristics of prenatal care and delivery centers.

Considering the Cronbach alpha coefficient of 0.941 and ICC of 0.951 ($P < 0.001$), it can be concluded that the questionnaire had internal consistency and stability of suitable. The results of the Cronbach alpha coefficient for each factor is shown in Table 2.

For the responsiveness of the questionnaire, the analysis of variance and least significant difference tests also indicated that the decision-making status of pregnant women in the age category of 21-30 years was different from those of 31-40 years statistically. Also, the decision-making status of women with first pregnancy was significantly different from other groups.

Because the ceiling and floor effects of the questionnaire were less than 20%, it showed that the interpretability of the questionnaire was favorable. Also, the MDC (9.70) was less than the MIC (12.91), indicating that the questionnaire had good interpretability (Table 3).

Discussion

Our main focus was on the concept of pregnant women's decision-making for choosing a prenatal care provider. The base of questionnaire was structured on interviews with pregnant women and prenatal care providers. Results of the factor analysis pointed out the communication skills, professional skills, personal traits of prenatal care providers, and characteristics of prenatal care and delivery centers were the main factors of pregnant women's deci-

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Table 2. Principle Factor Analysis With Varimax Rotation for the Questionnaire of Pregnant Women's Decision-making for Choosing a Prenatal Care Provider (PCPC-60)

Factor 3: Personal Traits with 15 Statements	
I choose a midwife or a gynecologist as prenatal care provider who ….	Loadings
Wears a suitable Islamic Hijab	0.731
Has an adorned appearance	0.756
Dose not to pay attention to its own financial gain	0.455
Is honest	0.328
Prays for me during delivery	0.580
Is punctual.	0.475
Is self-confident	0.470
Cares for my privacy during examinations.	0.488
Respects my beliefs.	0.589
lets me know about the decisions he/she has made about my treatment.	0.807
Devotes enough time to my examination	0.642
Refrains from professionally unethical activities	0.750
Is a female.	0.765
Gives me the right to choose the delivery route.	0.671
Gives me the right to choose the hospital for delivery.	0.778
Cronbach's α coefficient	0.821
Test- re-test (ICC)	0.737
Eigen values	1.239
Explained variance (%)	14.674
Factor 4: Prenatal Care Providing Center with 10 Statements	
I choose prenatal care providing center that...	Loadings
Is approved by my relatives and friends.	0.642
Has of polite / patient / friendly / and experienced staffs.	0.653
Has of experienced physicians (gynecologist, pediatrician, and anesthesiologist).	0.527
Has of suitable physical conditions (good location/proximity/beautiful design/comfort and cleanliness).	0.783
Is equipped with advanced medical supplies and facilities for delivery such as private rooms/ultrasound devices / a NICU.	0.559
Observes the rules and regulations regarding prenatal care and delivery.	0.557
Gives me the right to choose my midwife or physician.	0.621
Has regular appointments and short waiting times.	0.866
Provides cost-effective services that fit my budget.	0.736
Having a contract with basic or supplemental health insurance	0.719
Cronbach's α coefficient	0.847
Test- re-test (ICC)	0.847
Explained variance (%)	12.930
Eigen values	1.092

sion-making for choosing a prenatal care provider.

Omar et al (2001) conducted a study to design and test patients' satisfaction and expectations with the antenatal care questionnaire (PESPC). This questionnaire was extracted from the data of 3 focus groups. It was tested by 114 pregnant women who had received prenatal care. In construct validity, a total of 98 items were reduced to 41 that 29 items associated with satisfaction were classified into 4 factors: providing information, care provider, staff interest, and system characteristics. A total of 12 items associated with the expectation of pregnant women were classified into 4 factors of complete care, provider continuity, personalized care, and other services (provided by a nutritionist and social worker). The questionnaire had an acceptable internal consistency (26). In our study, face, content, and construct validity, internal consistency, and stability were used to assess the questionnaire, but PESPC validation was performed using construct validity. Just like the present study, the characteristics of the prenatal care centers was one of the factors of its instrument. In Omar questionnaire, communication skills, professional skills, and personal traits of antenatal care providers were considered as a construct. Our study was conducted to address pregnant women's decision-making regarding the selection of a prenatal care provider. Omar study, however, was an attempt to represent the satisfaction of pregnant women, which may account for the lack of professional skills, communication skills, and personal traits as constructs in this study. Another point is that although "information" was not an independent factor in our study, several items included in the factor of professional skills were mostly reliant on the "information" aspect (26). One of the positive points of our study is the design of a questionnaire based on the views of pregnancy care providers and pregnant women, while in the above study, only the opinions of pregnant women have been considered.

Prudencio et al (2013) validated patients' expectations and satisfaction using the PESPC instrument in Brazil. The 41 items of the questionnaire were divided into 2 dimensions: expectations and satisfaction. The face and content validity of the questionnaire was confirmed by a test on 10 pregnant women and its reliability was confirmed by an assessment on 40 pregnant women. The adapted version of the PESPC was exploited to measure construct validity, internal consistency, and stability. The questionnaire was completed by 119 pregnant women who had received prenatal care. The Cronbach alpha showed that internal consistency of 0.82 and 0.95 are acceptable for

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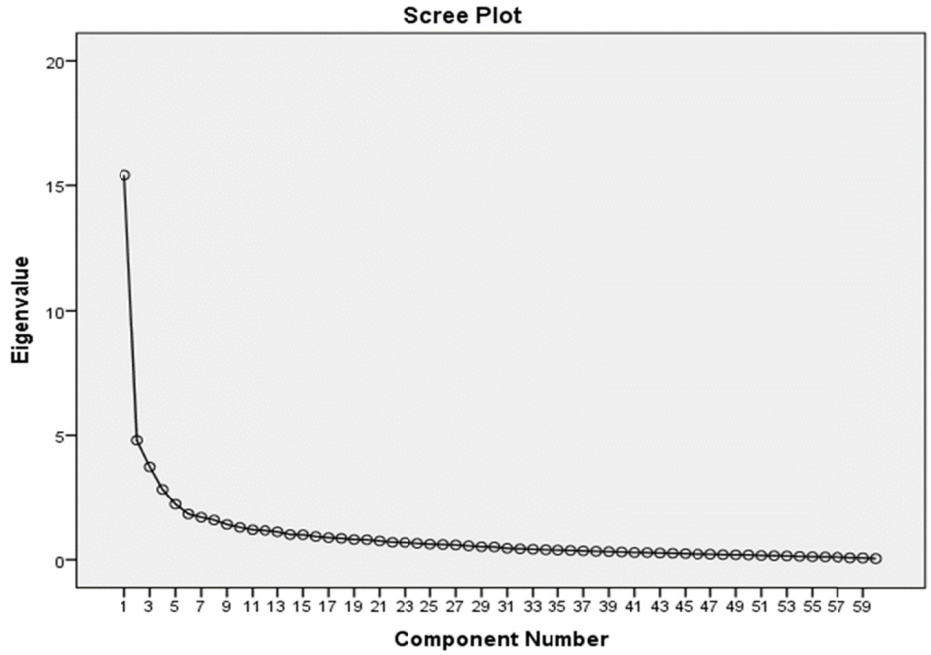

Fig. 1. Scree plot for determining factors of the CPCP-60 questionnaire

Table 3. Cosmin Criteria

Term			Results
Domain	Measurement property	The aspect of measurement property	
Reliability	Reliability (ICC)		0.951
	Internal consistency		0.941
	Measurement error		3.50
Validity	Content validity		Total CVI: 0.90
			Total CVR:0.76
		Face validity	One of the items was deleted because of IF<1.5
	Construct validity		EFA. extracted four factors
Responsiveness			MDC:9.70
			MIC: 12.91
Interpretability			Ceiling and floor effects were less than 20%

expectation and satisfaction factors, respectively. The re-test results showed a strong correlation for the expectation domain and a moderate correlation for the satisfaction domain (28). The psychometric indices of our questionnaire were similar to the internal consistency, stability, face, and content, and structure validity of the research instrument used in Brazil. In the previously-mentioned study, expectations and satisfaction of pregnant women were addressed and 2 factors with the same names were extracted. In the present study, however, the decision-making of pregnant women regarding the selection of prenatal care providers was shown and the extracted factors were introduced with different names. Our questionnaire was also made by the researcher, while Prudencio et al validated the questionnaire of other researchers in Brazil (28).

Mossadegh Rad et al (2014) investigated the affecting factors for the selection of a physician by patients in Iran. They developed a 40-item researcher-made questionnaire. The questionnaire was developed based on the relevant literature. Also, face validity, content validity, and the Cronbach alpha coefficient of the questionnaire were measured. Data analysis results indicated that the use of this questionnaire was acceptable in the study group. The questionnaire dimensions included type of service, location, physical environment, price, staff, care-providing processes, service package, performance, public perception of the physician, and advertising measures made by the physician. Data analysis results showed that the instrument had a suitable level of internal consistency in the experimental group. In the mentioned study, the questionnaire was developed based on the literature review (29). In order to enrich our research, we did a literature review, as well as interviews with pregnant women and prenatal care providers to strengthen the foundation questionnaire. Wood and Haber believed that data extracted from qualitative studies can provide useful information on the concept subjected to investigations (30). Moreover, in the present study face and content and construct validity, stability, and internal consistency were applied to determine the validity and reliability of the questionnaire and ensure that the designed instrument had high reliability and validity. Also, using the factor analysis determined which items formed a factor together, but Mossadegh Rad et al used face and content validity to validate the questionnaire. One of the factors that distinguishes our questionnaire from other instruments is its reliance on the decision-making of pregnant women. Although instruments used in

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past studies provided valuable information on patients' expectations from health care providers and factors that affect the choice of a physician, decision-making of pregnant women regarding selection of a prenatal care provider has not been evaluated by any exclusive questionnaire either in Iran or other countries.

It is hoped that policymakers, planners, and pregnancy care providers consider these results and implement strategies that meet the needs and expectations of prenatal care receivers, and put their effort into deemed areas of higher importance for pregnant women with regards to choosing prenatal care services. The results of the present study can provide pregnant women with the necessary insights into the selection of competent prenatal care providers and consequently improve their overall health.

This study may be regarded as an innovation because of the design and psychometric properties of the questionnaire for pregnant women's decision-making regarding a prenatal care provider. This was designed in an attempt to account for the concept of pregnant women's decision-making regarding choosing a prenatal care provider in Shiraz, Iran. This instrument can be used to assess the decision-making of pregnant women regarding the selection of a prenatal care provider in other Iranian cities and cultures, which requires a psychometric assessment of the questionnaire for the target groups.

The current study was the first to develop a tool to measure the factors affecting the decision-making of pregnant women for the selection of a prenatal care provider from different aspects. Although the CPCP-60 was designed and evaluated in the context of the Iranian culture, it can be applied to other cultures around the world. Also, the appropriate psychometric properties of the questionnaire make it suitable for use in clinical and research centers.

Conclusion

Hence, because of validity of the CPCP-60 questionnaire and its compatibility with the Iranian culture, it can be considered an appropriate measurement tool for determining the decision-making of pregnant women for choosing a prenatal care provider in Iran. Based on the results, using appropriate strategies can help improve women's decision-making about choosing a competent prenatal care provider.

Details of Ethics Approval

The current study is part of the Ph.D. dissertation of the first author in Reproductive Health, which received the code of ethics of IR. SBMU.PHNM.1396.843 from Joint Ethics Committee of Nursing, Midwifery and Pharmacology faculties at Shahid Beheshti University of Medical Sciences, Iran. Also, all participants completed a written informed consent.

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Conflict of Interests

The authors declare that they have no competing interests.

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