Psychometric Properties of the Iranian Version of a Postpartum Women's Quality of Life Questionnaire (PQOL): A Methodological Study

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Abstract

Background: There are some specific measures for the evaluation of postpartum quality of life, and each have some limitations.

Objectives: This study investigated the validity and reliability of the Persian version of a postpartum women's quality of life (PQOL) questionnaire at the eighth week of postpartum.

Patients and Methods: This was a methodological research, and subjects were 500 women, ages 18 - 42, eight weeks postpartum, randomly selected from half of the public centers in Tabriz, Iran, who completed questionnaires in a self-administered manner. Data was collected during a two-month period during 2014 - 2015. A standard forward - backward translation procedure was used to translate the English version of the PQOL into Persian. Content, construct, discriminant, and criterion validity was assessed. The reliability was evaluated by internal consistency and test-retest reliability.

Results: The PQOL showed good content validity; content validity ratio (CVR) ranged from 0.67 to 1.00 and content validity index (CVI) ranged from 0.78 to 1.00. Construct validity evaluation by exploratory factor analysis (EFA) led to extraction of six factors from the data. Due to the lack of theoretical justification for items' relocation in the extracted factors and poor-fitting indices obtained by confirmatory factor analysis (CFA), the exploratory model was eliminated, and the original model was presented and incorporated into the CFA, indicating an acceptable fit for the model (root mean square error of approximation [RMSEA] = 0.038 [0.034; 0.042]; comparative fit index [CFI] = 0.90; normed fit index [NFI] = 0.80; non-normed fit index [NNFI] = 0.90; incremental fit index [IFI] = 0.90). The intergroup differences in total and all dimensions of the PQOL, except for social support, indicated the discrimination ability of the questionnaire. The questionnaire indicated a medium correlation with the short form health survey (SF-12) questionnaire ($r \geq 0.50$). Cronbach's alpha coefficient (0.70 - 0.88) indicated a good internal consistency, and the intraclass correlation coefficients (0.87 - 0.92) showed good test - retest reliability.

Conclusions: The findings of this study confirmed the validity and reliability of the Iranian version of the PQOL questionnaire in Iranian women as a specific measure to evaluate the women's quality of life.

Keywords: Postpartum Women, Quality of Life, Reliability, Validity

1. Background

Postpartum problems are often numerous and sometimes multi-factorial, such as labor-induced or due to acute and chronic health problems, changes in social roles and problems in coping with them, changes in personal relationships, or mental disorders (1, 2), which are all important health factors (3). Since postpartum problems significantly affect maternal and neonatal health and directly influence the infant's development (4-6), postpartum maternal health has gained special academic interest in recent years. Considering such health-related multi-factorial dis-

orders makes evaluation of quality of life an overriding issue.

The world health organization (WHO) defines quality of life as an individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns (3). Measuring quality of life in different stages of life, including the postpartum period, can be particularly important in health promotion planning (7). Measures for evaluating the quality of life may be general or specific; specific measures are suitable to a spe-

cific condition or period, such as the postpartum period. Specific measures may garner a more sensitive response due to their supposed capabilities in determining small, although clinically significant, changes in specific groups and their outcomes (8).

There are few specific measures for evaluation of postpartum quality of life, and each has some limitations. The first specific measure for evaluation of postpartum quality of life is the mother-generated index (MGI) designed by Symon et al. (9) in 2001, which has a qualitative and subjective nature (9-11). This feature limits its applicability, especially in developing countries, because participants should have cognitive skills about the quality of life subject, whereas in developing countries, many women do not have enough information about quality of life and its effective factors (12, 13). The second measure is the maternal postpartum quality of life (MAPP-QOL) designed by Hill et al. (14). It asks about the mother's attitude about herself, her relationships, and her satisfaction with the delivery method. A limitation of this measure is that it does not address reproductive health rights (8), employment status, time for rest, and other issues. The third tool is the rural postpartum quality of life (RPQOL) designed though a standard method. This tool has some aspects of quality of life, according to the WHO's definition, such as physical, psychological, and social. A shortcoming of this measure is only rural women's viewpoints are in its design, while one of its advantages is its standard design (15).

The validated Iranian version of the MGI (16) and the special life quality questionnaire designed by Torkan et al. (17) are specific postpartum quality of life questionnaires in Iran. As mentioned above MGI has some limitation in developing country like Iran. Limitation of specific postpartum quality of life questionnaire is lack of addressing some aspects of quality of life such as employment status of the mother, the mother's sleep condition, the mother's confidence in her ability to care for the newborn and other issues.

The postpartum women's quality of life (PQOL) questionnaire designed by Zhou et al. in 2009 in China using standard methods addresses some aspects of reproductive health and is completed in a self-administered manner (18). It addresses all aspects of quality of life, which, according to the WHO's definition includes physical, psychological, and social aspects, and can be used in clinical as well as research settings to evaluate quality of life in the postpartum period (18).

2. Objectives

Because of the importance of quality of life in the postpartum period and because of the limitations of the tools

available in Iran, this study was conducted. The purpose of this study was to evaluate the psychometric parameters, including reliability and validity, of a postpartum women's quality of life (PQOL) questionnaire in the Iranian women population at 60 - 67 days postpartum.

3. Patients and Methods

3.1. Study Participants

In the factor analysis, a sample must include at least five subjects per item (19, 20). Considering a total number of 40 items, a sample size of 200 was required. However, given the cluster sampling design of the study, by applying the design effect of two, the sample size was increased to 400. Since the exploratory and confirmatory factor analyses were conducted on separate subsamples, the sample size was increased to 500 (21). Subjects were women, ages 18 - 42. Other inclusion criteria included having a singleton, healthy, and term newborn weighing over 2500 g; guidance school or higher education; being Iranian; and having access to a landline or mobile phone. In Iran, the two-month vaccination of all children is conducted in public health centers or posts, and a list of individuals referred for vaccination and their phone numbers are recorded in a specific notebook; therefore, we used the information to reach eligible subjects.

3.2. Measure Selection

Related literature was reviewed to find the specific measure for evaluation of postpartum quality of life. The search focused on a measure that could be used both in research studies and in the clinical setting to screen quality of life problems, which was cost effective and time saving (not requiring health staff to be present), and that encompassed all aspects of quality of life. The PQOL questionnaire met all these features. The study began after receiving query permission from the developers of the measure (18).

3.3. Measure

The PQOL questionnaire is a self-administered tool that consists of four dimensions, 20 domains, and 40 items. Its dimensions are:

Child care consisting of eight items (items 1 - 8) in the domains of child health, accidents, nutrition, and child development.

Physical function consisting of 12 items (items 9 - 20) in the domains of contraceptives, sleep and rest, energy, pain, ability to work, and body image.

Psychological function consisting of eight items (items 21 - 28) in the domains of self-confidence in child care, compliance with motherhood, and positive and negative feelings.

Social support consisting of 12 items (items 29 - 40) in the domains of social activity, family connection, getting help in childcare and house chores, home environment, the economic status of the family, and the outside environment.

The answer options for these items used five-point Likert scales, containing response categories concerned with intensity ([1] not at all, [2] slightly, [3] moderately, [4] very, [5] extremely); frequency ([1] never, [2] rarely, [3] sometimes, [4] often, [5] always); and evaluation ([1] very dissatisfied, [2] dissatisfied, [3] neither satisfied nor dissatisfied, [4] satisfied, [5] very satisfied). The PQOL domains were scored as summed rating domains, and transformed on a 0 - 100 scale, (responses were recorded) (22), with 0 indicating the poorest QOL and 100 indicating the best QOL.

Other questionnaires provided to mothers included the demographic questionnaire, Edinburgh postnatal depression scale (EPDS) (23), and the SF-12 (24). Validity and reliability of the Iranian version of the EPDS and SF-12 were assessed. Both measures can discriminate well between known groups and have good internal consistency (the Cronbach's alpha coefficient exceeded the minimum reliability standard of 0.70).

3.4. Validity Procedure

The validity of the PQOL was evaluated through six stages, including scale translation, content validity, face validity, construct validity, discriminant validity, and criterion validity.

3.5. Translation

The Persian translation of the inventory was carried out in a forward-backward translation procedure. To translate the questionnaire from English to Persian, the English version was independently translated by two Persian-speaking persons who were fluent in English and expert in postpartum mothers care. The two translators then discussed their translated version with each other and provided a copy upon which they agreed. Afterward, the back translation to the original English from the Persian version was conducted by a person who had not read the original version and was not involved in the translation process of the original. Finally, the two forward-backward and original versions were compared, and the final Persian version was obtained. The translated questionnaire was given to 30 eligible mothers to ensure its correct translation and the comprehensibility of its content, and then some modifications were made to the Persian version.

3.6. Content Validity

Ten experts experienced in the field of quality of life, the postpartum period, and measures design were consulted to determine the content validity. Both qualitative and quantitative methods were used in the process. In the qualitative method, the experts were asked to comment on the questionnaire, and after qualitatively evaluating in terms of grammar, use of the right words, placement of the items, and proper scoring, modifications were applied based on their feedback.

The content validity ratio (CVR) (25) and content validity index (CVI) (26) were used for the quantitative evaluation. A questionnaire involving questions in two general sections was administered for each expert. In the first section, to determine the CVR, the questions asked about the necessity of each item based on a four-point Likert scale (useless, unnecessary, useful, and necessary). Considering the number of experts and according to the Lawshe's tabulation, a $CVR \geq 0.62$ confirmed the necessity of the items. In the next section, to examine the CVI, the questions asked about the relevancy, clarity, and simplicity of each item based on a four-point Likert scale. A CVI score > 0.79 was considered reasonable. An open question also was asked to elicit the opinions of experts concerning each item.

3.7. Face Validity

Face validity was evaluated qualitatively and quantitatively. In the qualitative evaluation, the questionnaire was given to 30 mothers who had been referred to two selected centers for their newborns' two-month vaccination. The levels of difficulty, irrelevancy, and ambiguity of each item were assessed, and proper modifications were applied. In the next step, the quantitative item impact method was used to determine the importance of each item (27). The highest score would be 4.00.

3.8. Construct Validity

The factor structure of the PQOL was extracted using the exploratory factor analysis (EFA), utilizing principal axis factoring and oblimin rotation (19, 28). Factor-item loading values ≥ 0.40 were considered as satisfactory for allocation of an item to the factor. Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were conducted to survey the data fit. Values > 0.7 in the KMO test were acceptable for a factor analysis, and the Bartlett's test was significant (P < 0.050), pointing to the data fit and to detectable relations between variables that were to be factor analyzed (28). To assess how well the EFA extracted model fit the observed data, we conducted a confirmatory factor analysis (CFA) in a separate subsample using the method of weighted least squares for estimation. The asymptotic covariance matrix

was considered a weighted matrix. The input matrix was the covariance matrix of the data. The fit indices and reasonable values of these indices for the CFA were considered as chi-squared/df < 5, root mean square error of approximation (RMSEA) < 0.08, and comparative fit index (CFI), normed fit index (NFI), incremental fit index (IFI) > 0.9 (28, 29).

3.9. Discriminant Validity

According to the results of some studies on postpartum women's quality of life, it was expected that women with vaginal delivery, non-depressed women, and those who have a high household income would have higher levels of quality of life. Therefore, discriminant validity (a part of construct validity) was evaluated using an independent t-test and ANOVA to examine the intergroup differences in quality of life scores in terms of delivery type (30-32), depression, and household income (13, 33).

3.10. Criterion Validity

The SF-12 questionnaire was used as the standard measure to evaluate the criterion validity of the questionnaire. SF-12 is accepted widely as a standard measure for evaluation of the quality of life in the Iranian community (24, 34). The correlation between the scores of domains of the two questionnaires were calculated. Pearson's correlation among the scales was used, given the normal distribution of the data. Values less than 0.1, between 0.1 and 0.3, between 0.3 and 0.5, and greater than 0.5 indicated insignificant, poor, medium, and strong correlations, respectively (35).

3.11. Reliability

Internal consistency was assessed by calculating Cronbach's alpha coefficient (36). Alpha coefficients $\geq$ than 0.70 were considered satisfactory. Test-retest reliability was evaluated by completing the questionnaire twice with a two-week interval by 30 women who were randomly selected. The intraclass correlation coefficient (ICC) was computed to evaluate the stability over time. ICCs $\leq$ 0.4 were considered poor to fair, 0.41 - 0.60 moderate; 0.61 - 0.80 good; and > 0.80 excellent (37).

3.12. Data Collection

Participants were enrolled through the radomized cluster sampling method from half of the health care centers of Tabriz, Iran, during two months (November 2014-January 2015). In the first stage, software (www.Random.org) was used to determine the sequence of 42 health centers and 33 health posts in Tabriz. The first

22 health centers and 15 health posts in the compiled randomized list were considered the research environment. The quota of each center or post was determined based on the number of referrals to the selected center or post to give the two-month vaccination. In each health center or post, the names of the mothers and infants receiving their two-month vaccination were recorded at the centers and posts. Then the researchers would call the mothers who were in the 60 - 67 days of postpartum and give a brief explanation on the objectives and procedure of the study. The potentially eligible mothers were invited to refer to the health centers or posts to participate in the study. The participants then were examined more carefully in terms of inclusion and exclusion criteria, and all eligible subjects were asked to complete a set of paper questionnaires. Researchers accompanied the mothers while they completed the questionnaires, and the researchers received the completed questionnaires personally.

3.13. Ethical Considerations

Before beginning the study, the research protocol was approved by the ethics committee of the Tabriz University of Medical Sciences (code and date of ethical approval: 5/4/4856 and May 3, 2014). In addition, participants were informed of the research procedure and given comprehensive information on the objectives. They also were informed about confidentiality, privacy, the right to end their participation, and benefits. A signed consent form was obtained before data collection. All questionnaires were anonymous, and files that included participants' contact were shredded after all data were collected. Only research-related personnel could access and use the data.

3.14. Statistical Analysis

The data were presented as mean (SD) and frequency (%) for the variables. The normality assumption of the quantitative data was examined using skewness and kurtosis measures. For skewness, absolute values > 3 (38), and for the kurtosis, absolute values > 10 (39), suggested a problem.

To calculate the score of each of the dimensions defined in the PQOL questionnaire, the existing responses were first recoded and normalized to the 0 - 100 range. The score of each domain was then obtained based on the mean score of the questions related to that domain. As already mentioned, the validity and reliability of the measure also was determined.

The EFA and CFA were conducted on split subsamples so that the data set was split into two subsamples with 200 and 300 cases, and the EFA and CFA were conducted on these datasets, respectively.

Additionally, the percentages of possible minimum and maximum scores were computed as floor and ceiling effects, respectively.

Statistical analysis was performed using SPSS 21 and Amos 18. P Values < 0.050 were considered as significant.

4. Results

The time to fill out the PQOL questionnaire was about 5 - 10 minutes. It took about 20 minutes to fill out all the questionnaires. All data were collected during a two-month period in 2014 - 2015. All eligible women were willing to participate in the study. Two participants had not responded to one question of the PQOL questionnaire (question 2 and question 35), and the lost data were imputed using the multiple imputation method. The mean age of the participants was 28.0 (5.0) years and half had a secondary education. About half (53%) were primiparous, and 372 subjects (74%) had a cesarean section (Table 1).

Table 1. Socio-Demographic Profile of the Population (n = 500)

Characteristics	No. (%)
Age, y	
< 20	27 (5.4)
20 – 34	423 (84.8)
> 35	50 (9.8)
Education, y	
Secondary, 6 - 8	84 (16.8)
Senior high school, 9 - 12	250 (50.0)
College, +13	166 (33.2)
Occupation	
Student	18 (3.6)
Housewife	425 (85.0)
Employed	57 (11.4)
Parity	
First	267 (53.4)
Second	210 (42.0)
Third and over	23 (4.6)
Type of recent delivery	
Vaginal	128 (25.6)
Caesarean section	372 (74.4)
EPDS	
Depressed (Mean score ≥ 14)	118 (23.6)
Non-depressed (Mean score ≤ 13)	382 (76.4)

Abbreviation: EPDS: Edinburgh postnatal depression scale.

According to the experts' comments, all items of the PQOL questionnaire were grammatically proper, and the words and their placements were suitable. In the quantitative evaluation of the content validity, the CVI and CVR showed satisfactory results for all items (CVR ranged 0.67 - 1.00 and CVI ranged 0.78 - 1.00). All items achieved an impact score of 1.5, and more than 1.5 remained in the questionnaire (Tables 2, 3).

Table 2. [Part 1] The impact Score, CVI, and CVR for Items of the PQOL

PQOL	Impact Score	CVI	CVR
PQOL1	3.9	0.94	1.00
PQOL2	3.8	0.94	1.00
PQOL3	3.6	0.83	0.67
PQOL4	3.5	0.83	0.67
PQOL5	4.0	0.89	1.00
PQOL6	3.9	0.78	1.00
PQOL7	3.3	0.94	0.67
PQOL8	3.3	0.78	0.67
PQOL9	3.4	0.78	1.00
PQOL10	3.5	0.78	1.00
PQOL11	4.0	1.00	1.00
PQOL12	3.8	1.00	1.00
PQOL13	4.0	0.89	1.00
PQOL14	4.0	0.94	1.00
PQOL15	3.8	0.89	1.00
PQOL16	4.0	1.00	1.00
PQOL17	3.9	0.89	1.00
PQOL18	3.9	0.83	1.00
PQOL19	3.7	0.94	1.00

Abbreviations: CVI, content validity index; CVR, content validity ratio; PQOL, Postpartum quality of life.

The 40 items approved in the content and face validity were entered into the factor analysis. All items with a correlation coefficient of 0.10 - 0.45 were placed in the relevant factor. Exploratory factor analysis with oblimin rotation extracted six factors (based on the screen test) from the PQOL accounting for 34.8% of total variance. A Kaiser-Meyer-Olkin (KMO) value of 0.77 and P < 0.05 for the Bartlett's test also confirmed the adequacy of the factor model. However, displacement of the items following the EFA was not theoretically well justified. On the other hand, results obtained from the CFA of the explanatory model did not show an acceptable fit. Therefore, the explanatory model was neglected and the theoretical model proposed in the original version, which includes four factors of child-

Table 3. [Part 2] The impact Score, CVI, and CVR for Items of the PQOL

PQOL	Impact Score	CVI	CVR
PQOL 20	3.1	0.89	0.67
PQOL21	3.9	1.00	1.00
PQOL22	4.0	0.94	1.00
PQOL23	3.7	1.00	1.00
PQOL24	3.7	0.89	1.00
PQOL25	4.0	0.89	1.00
PQOL26	3.2	0.89	0.67
PQOL27	4.0	0.89	1.00
PQOL28	4.0	0.89	1.00
PQOL29	3.7	0.94	1.00
PQOL30	3.4	1.00	1.00
PQOL31	4.0	0.94	1.00
PQOL32	4.0	1.00	1.00
PQOL33	4.0	1.00	1.00
PQOL34	4.0	1.00	1.00
PQOL35	3.8	0.89	1.00
PQOL36	3.9	0.89	1.00
PQOL37	3.8	0.83	1.00
PQOL38	3.9	0.89	1.00
PQOL39	3.8	0.94	1.00
PQOL40	3.9	0.94	1.00

Abbreviations: CVI, content validity index; CVR, content validity ratio; PQOL, Postpartum quality of life.

care, physical functioning, psychological functioning, and social support, was entered into the CFA. The CFA factor loading is shown in Figure 1. The CFA results of the theoretical model showed an acceptable fit for each factor and the scale (Table 4).

There were statistically significant differences in the total mean score and all domains of quality of life, except for social support, between women with vaginal delivery and those with cesarean delivery (total score: 59.9 (7.7) vs. 57.7 (8.0), P = 0.003) (Figure 2) and between the two groups of women with postpartum depression and those without depression (total score: 51.1 (4.0) vs. 60.3 (7.0), P < 0.001) (Figure 3). There was a statistically significant difference in the total mean score and mean score of physical function between the different groups of household income. Tukey's test revealed that the difference between high- and low-level household income and between moderate- and low-level household income were significant in terms of physical-functioning score; the difference between high-

and low-level household income was significant in terms of the total score (Figure 4). The discriminate validity was confirmed.

Positive significant relationships were observed between score of all domains score of the PQOL, and the scores of physical and mental subscale score of the SF-12, except social support domain. medium correlation (r = 0.49, r = 0.47) was observed between the total score of PQOL and Physical sub-scale and Mental health sub-scale of SF-12 (Table 5), which confirmed the criterion validity of the PQOL questionnaire.

Internal consistency of the PQOL (assessed by Cranach's alpha coefficient) and its test–retest reliability (assessed by ICC) were satisfactory (α = 0.88 and ICC = 0.87). The results showed satisfactory internal consistency and ICC for all subscales (Table 6).

Considering the QOL total score, childcare, physical function, psychological function, and social support subscales, the percentage of ceiling and floor effects were 0% and 0%, 0% and 0.4%, 0% and 0%, 0% and 0%, and 0% and 0%, respectively, all < 15 %.

5. Discussion

Results confirmed validity and reliability of the Iranian version of the PQOL. The questionnaire was able to discriminate between different groups of women in terms of delivery type, postpartum depression, and level of household income. Criterion validity was confirmed with strong correlation between this measure and SF-12.

Content validity was confirmed using experts' comments after both qualitative and quantitative review. In the original study (18), in which the questionnaire was designed, content validity was evaluated only qualitatively, whereas, in the present study, the CVR was calculated to investigate the necessity of the items, and the CVI was calculated to investigate the simplicity, clarity, and specificity of the items. Using these techniques (CVR and CVR) is one of the strengths of this study.

The EFA explores six factors with a predictive power of 34.8%; however, given the lack of confirmation, the exploratory model was neglected, and the model of the original structure presented by Zhou (18) was entered in the confirmatory factor analysis, which was confirmed based on the fitting coefficients of the model.

Results showed that women with vaginal delivery experienced higher levels of quality of life compared with those who had cesarean delivery. This also has been reported by other studies (17, 31, 32). The study by Torkan et al. (17) in Esfahan on 100 women at 6 - 8 and 12 - 14 weeks after delivery, the study by Mousavi et al. (31) in Shahrood on 356 women at eight weeks after delivery, the study by Sadat
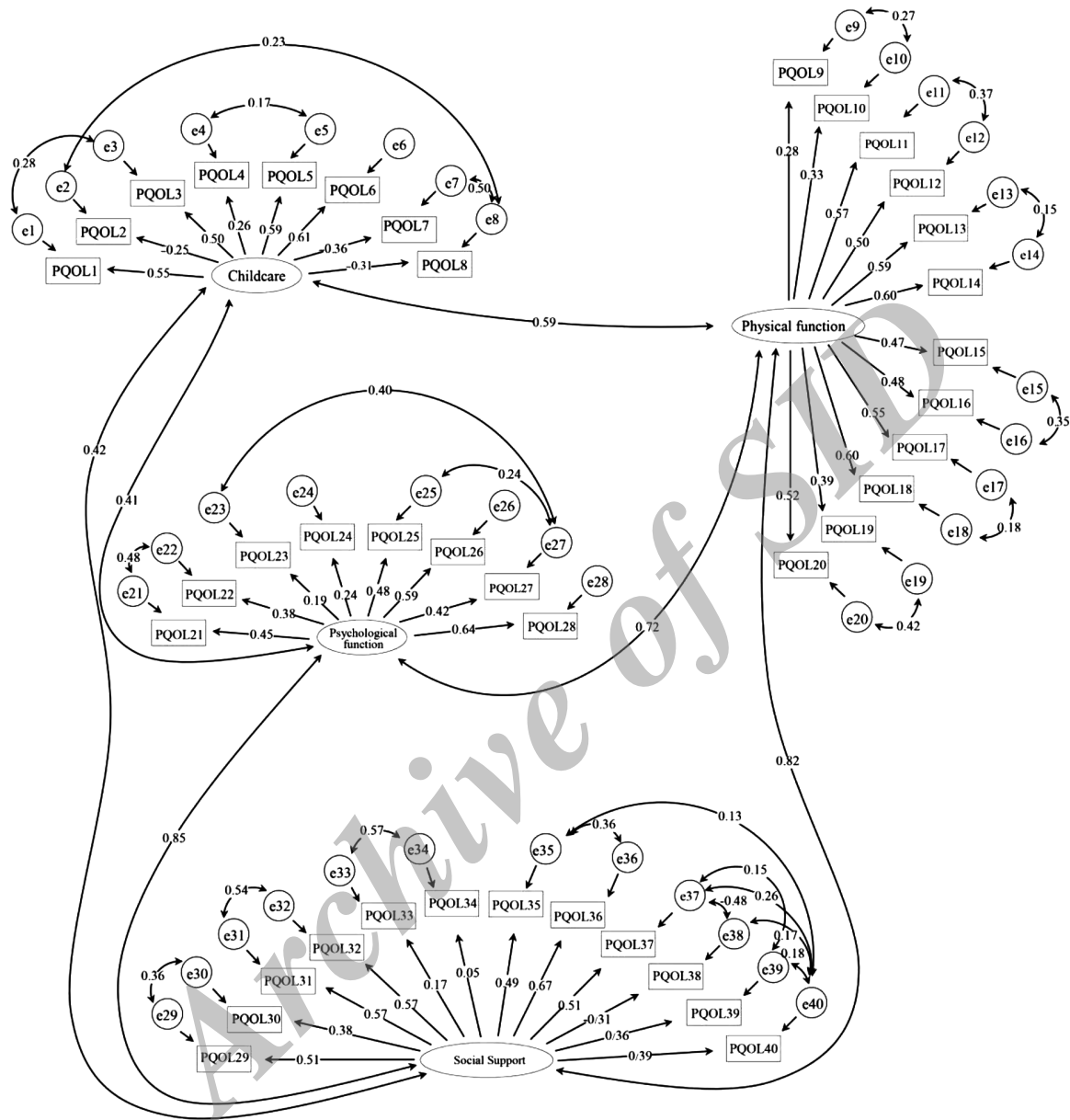
Figure 1. CFA Factor Loading

et al. (32) in Kashan on 300 women at 2 - 4 months after delivery, and the study by Jansen et al. (30) in the Netherlands on 71 women with vaginal delivery at 14 - 24 hours after delivery and 70 women with cesarean delivery at 24 - 48 hours after delivery all reported a higher quality of life in women with vaginal delivery.

Women with low household income and those with postpartum depression experienced lower quality of life,

which is consistent with other studies (13, 33). In a study conducted by Nagpal et al. (13) in India on 50 women at six months after delivery, mothers with a low level of household income reported a lower quality of life. The results of a cohort study conducted by Darcy et al. (33) in the United States on 217 women with four-month intervals until 16 months after delivery showed that mothers who had reported symptoms of postpartum depression had a lower

Table 4. Results of Fit Index CFA of PQOL (n = 500)[a]

Model	X²	df	X²/df	NNFI	RMSEA (90% CI)	CFI	NFI	IFI
Exploratory model	2148.84	650	3.31	0.69	0.068 (0.065; 0.071)	0.71	0.64	0.71
Theoretic model	1226.21	711	1.73	0.90	0.038 (0.034; 0.042)	0.90	0.80	0.90

Abbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; df, degree of freedom; IFI, incremental fit index; NFI, normed fit index; NNFI, non-normed fit index; PQOL, postpartum quality of life; RMSEA, root mean square error of approximation; X², Chi-square; df: Degree of freedom; X²/df, normed chi-square.
[a]All item scale relationships were statistically significant P < 0.001.

Table 5. The Pearson's Correlation Between PQOL and SF-12

| | SF-12 | | | | | | | | | |
| | Health Concepts | | | | | | | | Sub-Scales | |
PQOL	PF	RP	BP	GH	VT	SF	RE	MH	Ph.t	M.t
Childcare	0.119[b]	0.165[b]	0.255[b]	0.221[b]	0.236[b]	0.199[b]	0.279[b]	0.012	0.260[b]	0.301[b]
Physical function	0.333[b]	0.394[b]	0.423[b]	0.403[b]	0.387[b]	0.344[b]	0.465[b]	-0.038	0.535[b]	0.489[b]
Psychological function	0.189[b]	0.265[b]	0.298[b]	0.306[b]	0.340[b]	0.262[b]	0.331[b]	0.003	0.364[b]	0.390[b]
Social support	-0.038	-0.030	-0.002	0.049	-0.037	-0.103[a]	-0.024	0.013	-0.007	-0.066
PQOL total	0.264[b]	0.336[b]	0.404[b]	0.394[b]	0.378[b]	0.304[b]	0.439[b]	-0.012	0.481[b]	0.465[b]

Abbreviations: BP, Bobdily pain; GH, general health; MH, mental health; M.t, mental health subscale (VT, SF, RE, M); PF, physical function; Ph.t, physical subscale (PF, RP, BP, GH); PQOL, postpartum quality of life; QOL.T (Ph.t, M.t)RP; QOL.T, total score of SF-12; RP, role physical; RE , role emotional; SF, social function; SF-12, short form health survey-12; VT, vitality.
[a]Correlation is significant at the 0.05 level (2-tailed).
[b]Correlation is significant at the 0.01 level (2-tailed).

Table 6. Mean, Standard Deviation, Cronbach's alpha, and Intraclass Correlation Coefficient for the Iranian Version of the PQOL (n = 500)[a]

	Mean (SD)	Skewness	Kurtosis	Cronbach's α	ICC (%90 CI)
Child care	53.83 (16.28)	0.22	-0.34	0.70	0.90 (0.78; 0.95)
Physical function	52.16 (14.13)	-0.08	-0.45	0.78	0.91 (0.82; 0.96)
Psychological function	71.65 (9.26)	-0.51	0.08	0.71	0.92 (0.84; 0.97)
Social support	57.90 (6.70)	-0.33	0.04	0.70	0.92 (0.83; 0.97)
Total QOL	58.11 (7.90)	0.00	-0.18	0.88	0.87 (0.78; 0.93)

Abbreviations: ICC, intraclass correlation coefficient; PQOL, postpartum quality of life;.SD, standard deviation.
[a]The score ranged 0 - 100 in each of the four factors and in the total, with lower values indicating low quality of life.
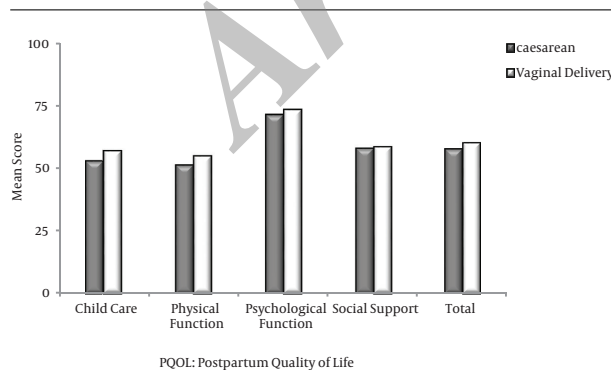
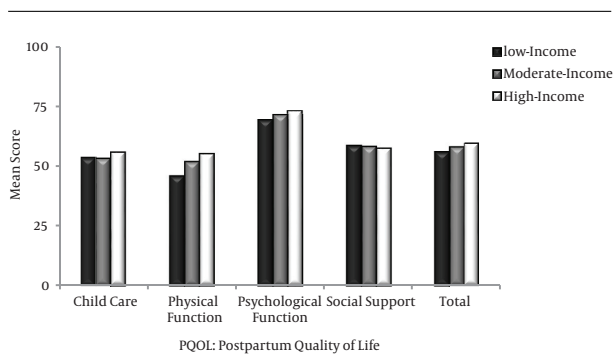
Figure 2. PQOL Scores in Women With Vaginal Delivery and With Cesarean Delivery
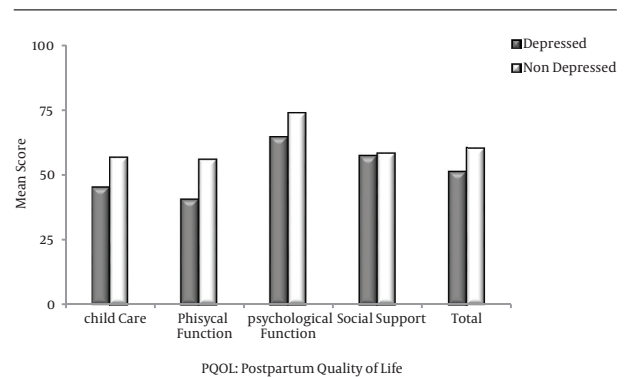
Figure 3. PQOL Scores in Women With Postpartum Depression and Without Depression

Figure 4. PQOL Scores in Women With Different Economic Status

quality of life.

Results indicated a medium correlation between the scores of the SF-12 and the PQOL that confirmed the criterion validity. Regarding criterion validity, no significant relationship was observed between the social support domain in the PQOL and the SF-12, which can be due to the variety of the mothers' responses to the questions related to this domain. This probably reflects the need to add other items in this field. In this regard, it is recommended to conduct studies by adding multiple items in the social support domain and addressing the cultural-psychological characteristics of Iranian women.

Reliability was confirmed by a Cronbach's alpha coefficient > 0.7 (for total and domains). No research was found to compare and confirm this matter.

The high ICCs for the total scale (0.87) and subscales demonstrated a strong stability of the PQOL over time.

The PQOL questionnaire is a specific, cost-effective and time-saving measure (not requiring health staff presence) for evaluating quality of life in postpartum period. Due to its self-administered nature, which saves time and cost, it can be utilized in clinical settings by midwives, doctors, and nurses who are involved in postpartum care and used in research settings. The PQOL addresses reproductive rights, to which other specific measures (11, 14, 15, 17) do not give as much attention.

5.1. Strengths and Limitations

One of the strengths of this study includes a large sample size of five participants per item for factor analysis, which is better than the PQOL development study, which was based on 200 subjects (18). Our study has several limitations. First, most subjects had a secondary education, were primiparous, and were housewives, which limited its generalizability of the results to all Iranian postpartum women. Secondly, all subjects were Tabriz residents, the fifth largest city in Iran with another language (Azeri). Therefore, studies on the reliability and validity of the questionnaire in other parts of Iran and in other groups of women with different languages and cultures are recommended. It appears that this questionnaire can facilitate the postpartum care and help evaluate women's quality of life and identify potential problems in this important period. It also can be used to determine the factors associated with women's quality of life.

The present study confirmed the psychometric evaluation of the PQOL in Iranian women. Utilizing this measure can solve the obstacles in evaluating postpartum women's quality of life both in clinical and research settings; in addition, it can be used by those involved in postpartum care, including midwives in health centers.

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