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Turkish validity and reliability study of obstetric quality of recovery score (OBSQOR-11)

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ABSTRACT

Objective: The present study was conducted to adapt the Obstetric Quality-of-Recovery Score (ObsQoR-11) into Turkish and to test its validity and reliability.

Study Design: This study was designed as a methodological study, and the research population consisted of women who gave birth in the gynecology and obstetrics wards of two hospitals in Rize between January and March 2021 and who were hospitalized in the inpatient service 24 hours after delivery. We did not select a sample for the study and instead applied face-to-face questionnaires to women (vaginal delivery: 117 patients, cesarean delivery: 112 patients). Data collection tools included a questionnaire form developed by the researcher and the ObsQoR-11-TR scale.

Results: While testing the ObsQoR-11-TR scale for validity and reliability, we first used a language validity method and then exploratory and confirmatory factor analysis methods. Accordingly, the ObsQoR-11-TR scale had a KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) value of 0.833 and a Bartlett's Test of Sphericity chi-squared value of 1818.396 ($p<0.05$). The two-factor model created here explained 69.39% of the variance. According to the exploratory factor analysis results, the factor loads of the items ranged from 0.490 to 0.920, and all items except one displayed factor load greater than 0.774. Again, according to the exploratory factor analysis, the scale was found to consist of two factors. This is consistent with the scale's original form. We used Cronbach's alpha test to calculate the reliability of the scale. Cronbach's alpha value was found to be high (0.781) for the whole scale and excellent for factor 1 (0.850) and factor 2 (0.920).

Conclusions: Our validity and reliability tests conclude that the ObsQoR-11-TR consists of 11 items and 2 subscales and is a valid and reliable scale for Turkish society.

Keywords: Obstetric quality of recovery score; validity; reliability

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INTRODUCTION

Giving birth is a significant experience that affects women's lives physically, psychologically, and socially. This impact continues in the postpartum period. The traditional approach deals with the postpartum period on a cross-sectional basis and not as a process, focusing mostly on mortality and morbidity criteria when evaluating maternal health. The contemporary approach argues that these criteria alone would not be sufficient, so it is necessary to focus on mothers' recovery levels and changes in their quality of life in the postpartum period (1). Following this process periodically will ensure the early detection of any complications or diseases that may occur. Research on the postpartum quality of life of mothers has often focused on recovery after cesarean section. Recovery after cesarean delivery is a complex process that depends on the patient, the surgical and anesthetic methods, and post-operative complications.

Recovery scores that evaluate the quality of the delivery process, named QoR 40 (1) AND QoR 15 (2) (QoR=quality of recovery), have been developed to assess post-operative recovery results reported by patients. These tools measure some crucial factors like pain, physical comfort, physical independence, psychological support, and emotional state to assess post-operative recovery accurately.

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They have also been tested for validity and reliability in inpatient and day-case surgery populations not associated with delivery (2, 3). Still, these scales do not analyze the factors involving infant care after cesarean or vaginal delivery, instead, focus on overall post-operative recovery. However, new mothers try to fulfill the responsibilities of motherhood while also struggling with childbirth's physical and psychological effects. Evaluating mothers' adequacy and comfort regarding infant care and feeding while questioning their postpartum status can shed better light on the postpartum period. The English version of the obstetric quality of recovery score (ObsQoR-11) was first developed by Ciechanowicz et al. for this purpose, and it differs from other relevant scales by including questions about infant care (4). Though the scale focuses on the recovery of mothers giving birth by cesarean section, the content of the items suggests that they can also be applied to women undergoing vaginal birth. After all, women go through similar recovery phases following vaginal delivery.

The current study aims to adapt this scale into Turkish, to test it for validity and reliability, and to compare cesarean section and normal delivery in terms of the associated recovery process.

MATERIAL and METHODs

This study was designed as a methodological trial to adapt the ObsQoR-11 into Turkish and test it for validity and reliability. For this purpose, we obtained an ethics committee approval dated 25.01.2021 and numbered 2021/01 from the Ethics Committee for Non-Interventional Clinical Research at Recep Tayyip Erdogan University. The study was conducted in accordance with the principles of the Declaration of Helsinki developed by the World Medical Association.

Population and Sample

The study population consisted of women undergoing cesarean section or vaginal delivery at the gynecology and obstetrics wards of the Recep Tayyip Erdogan University Training and Research Hospital from January and March 2021. We applied the questionnaires at the 24th hour after birth through face-to-face interviews with the patients. We did not determine a sample for the study. Research on scale development suggests reaching 5 to 30 participants per item (5).

Given that the scale consists of 11 items, we needed to reach more than 10 participants per scale item in each delivery type group (vaginal or cesarean section). Hence, we finally included 117 women who gave birth by vaginal delivery and 112 women who gave birth by cesarean section, all participating voluntarily.

Data Collection Tools, Data Collection, and Data Evaluation

The data collection tool consisted of two parts. The first part inquired about participant characteristics (age, number of pregnancies/deliveries, length of hospital stay, body mass index, gestational week, and infant's weight and sex). The second part was the 11-item original form of ObsQoR-11 developed by Ciechanowicz S. et al. (4). The ObsQoR-11 is a Likert-type scale consisting of 11 items; the first 6 items inquire how the patient has felt during the last 24 hours and the remaining 5 items evaluate how they are currently feeling. Because the first 5 questions ask about symptoms (moderate or severe pain, nausea-vomiting, dizziness, tremor) their scores are reversed in the analysis. The remaining 6 items question patients' overall ability to act independently and to meet their needs without assistance. A high score from the scale indicates a high level of post-operative recovery. Ciechanowicz S. et al. measured the internal consistency of the scale using Cronbach's alpha and split-half reliability and found it to be within recommended limits (0.7-0.9) (4, 6).

Statistical Analysis

Participants' demographic characteristics are described as frequency, percentile, and mean and standard deviation. For validity and reliability tests, we used the item analysis, Cronbach's alpha reliability coefficient, explanatory factor analysis, and confirmatory factor analysis methods under structural equation modeling. We used the IBM SPSS 25 package software for explanatory factor analysis and the AMOS 23 package software for confirmatory factor analysis. P values <0.05 were considered significant.

RESULTs

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Table 1. Patient characteristics

Variable	Normal delivery (117)	Cesarean section (112)	Total (229)	p
Age (yr), mean (SD)	28.91 (6.56)	30.13 (6.24)	29.51 (6.42)	0.154
A mean number of pregnancies (SD)	2.36 (1.62)	2.32 (1.41)	2.34 (1.52)	0.852
A mean number of deliveries mean (SD)	2.11 (1.31)	2.13 (1.14)	2.12 (1.23)	0.888
Mean length of hospital stay (SD)	1.32 (1.54)	2.10 (0.96)	1.70 (1.34)	**<0.001**
BMI kg/m^2, mean (SD)	30.63 (5.32)	31.57 (5.94)	31.09 (5.64)	0.208
Mean gestational week (SD)	38.70 (1.73)	37.21 (2.63)	37.97 (2.33)	**<0.001**
Mean birth weight of the infants (gr), (SD)	3281.92 (506.68)	3143.66 (594.25)	3214.30 (554.38)	0.059
Baby gender female, n (%)	59 (50.4)	49 (43.8)	108 (47.2)	0.312

Table 2: Mean, Standard Deviation, Rotated Factor, and Reliability Analysis Results of ObsQoR-11-TR items

	Mean (SD)	FACTOR 1	FACTOR 2
How have you felt in the last 24 hours?			
I had moderate pain.	4.41 (3.47)	0.490	
I had severe pain.	4.45 (3.98)	0.785	
I had nausea and vomiting.	5.13 (4.26)	0.891	
My head was spinning.	5.39 (4.28)	0.868	
There was a shivering sensation.	4.66 (4.09)	0.868	
How are you feeling right now?			
I feel comfortable.	7.43 (2.83)		0.774
I can act independently.	7.40 (3.16)		0.921
I can carry my baby without anyone's help.	7.61 (3.32)		0.898
I can care for and feed the baby without anyone's help.	7.24 (3.50)		0.882
I can meet my personal hygiene and toilet needs.	7.86 (3.38)		0.857
I feel in control.	7.75 (2.01)		0.789
Cronbach's alpha: 0.781 for full scale, 0.850 for Factor 1, 0.920 for Factor 2			

Table 3: Results of confirmatory factor analysis (model fit indices) of the scale

Model fit indices (9)	Good fit	Acceptable fit	Scale's value
NPAR	-	-	25
The chi-square (χ2)	-	-	128.089
p coefficient	0.05<p≤1	0.001<p≤0.05	0.01
The degrees of freedom (sd)	-	-	41
The chi-square divided by the degrees of freedom (χ2/sd)	0≤ χ2/sd ≤2	2< χ2/sd ≤3	2.124
The root mean square error of approximation (RMSEA)	0≤ RMSEA≤0.05	0.05< RMSEA≤0.10	0.097
Comparative fit index (CFI)	0.95≤ CFI ≤1	0.90≤ CFI <0.95	0.952
Goodness-of-fit Index (GFI)	0.95≤ GFI ≤1	0.90≤ GFI <0.95	0.906
The adjusted goodness-of-fit statistic (AGFI)	0.90≤ AGFI ≤1	0.80≤ AGFI<0.90	0.849
Incremental Fit Index (IFI)	0.95≤ IFI ≤1	0.90≤ IFI <0.95	0.952
Tucker–Lewis index (TLI)	0.95≤ TLI ≤1	0.90≤ TLI <0.95 (or TLI>0.80)	0.935

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Table 4: Investigation of the factors affecting the ObsQoR-11/TR Scale and its subgroups by multivariate linear regression

Variable	F1 Multivariate regression Beta-(95 % CI) p	F2 Multivariate regression Beta-(95 % CI)-p	Total Multivariate regression Beta-(95 % CI)-p
Type of delivery (VD:0, CS:1)	15.61 (11.55-19.67) **<0.001**	-12.20 (-16.35- -8.06) **<0.001**	3.40 (-2.85-9.66) 0.285
Age (yr)	0.08 (-0.44-0.29) 0.687	0.13 (-0.24-0.51) 0.481	0.06 (-0.51-0.62) 0.837
Number of delivery	0.63 (-1.20-2.45) 0.499	0.27 (-1.60-2.13) 0.780	0.89 (-1.92-3.71) 0.533
Length of hospital stay	-1.01 (-2.50-0.48) 0.181	-0.52 (-2.04-1.00) 0.500	-1.53 (-3.82-0.76) 0.189
BMI (kg/m^2)	0.28 (-0.51-1.61) 0.305	-0.12 (-0.46-0.23) 0.510	0.17 (-0.36-0.69) 0.528
Pregnancy week	0.55 (-1.20-2.45) 0.499	0.25 (-0.83-1.33) 0.644	0.80 (-0.82-2.43) 0.331
Birth weight of the infants (gr)	-0.001 (-0.005-0.003) 0.638	-0.001 (-0.005-0.004) 0.808	-0.002 (-0.008-0.005) 0.641
Baby gender female	1.35 (-2.38-5.08) 0.476	2.16 (-1.65-5.97) 0.265	3.51 (-2.24-9.26) 0.230
	Adjusted R square: 0.207 Model ANOVA p: <0.001 Dubin Watson: 0.747	Adjusted R square: 0.147 Model ANOVA p: <0.001 Dubin Watson: 0.688	Adjusted R square: 0.029 Model ANOVA p: 0.582 Dubin Watson: 0.061

Table 5: The ObsQoR-11/TR (Turkish Version of the ObsQoR-11)*

Son 24 saat içerisinde nasıl hissettiniz?
1. Orta düzeyde ağrım vardı.
2. Şiddetli derecede ağrım vardı.
3. Bulantı ve kusma geçirdim.
4. Başım dönüyordu.
5. Titreme hissi geliyordu.
Şu an nasıl hissediyorsunuz?
6. Kendimi konforlu hissediyorum.
7. Bağımsızca hareket edebiliyorum.
8. Kimsenin yardımı olmadan bebeğimi taşıyabiliyorum.
9. Kimsenin yardımı olmadan bebeğin bakımını ve beslenmesi sağlayabiliyorum.
10. Kendi kişisel hijyenimi ve tuvalet ihtiyacımı karşılayabiliyorum.
11. Kendimi kontrol altında hissediyorum

*Sorulara 0 (hiç katılmıyorum) ile 10 puan (tamamen katılıyorum) arasında bir değer veriniz.

Figure 1. Scree plot graphic of the scale

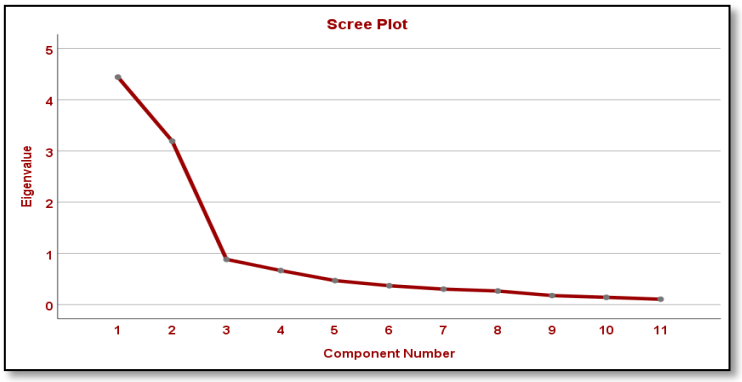

Figure 2: Inter-item correlation coefficients of the scale

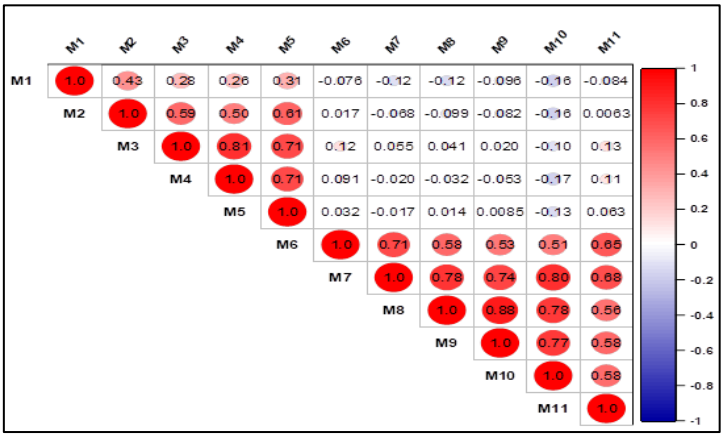

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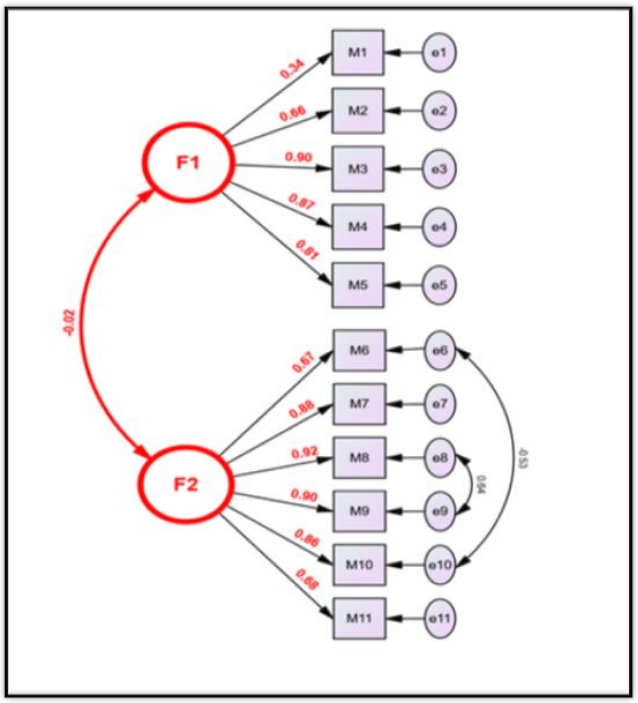
Figure 3: Confirmatory factor analysis diagram



DISCUSSION

Our findings indicate that the ObsQoR-11/TR is valid and reliable. We conclude that the scale can be used to determine mothers' recovery levels after either vaginal delivery or cesarean section. A construct validity test, which we performed after ensuring language validity, is considered a test's ability to fully and impartially explain mental and social well-being, which cannot be measured directly by laboratory or biopsy findings (10).

We performed an exploratory factor analysis and a confirmatory factor analysis to evaluate the construct validity of the ObsQoR-11/TR. We also performed the Kaiser-Mayer-Oklin (KMO) test and Bartlett's test of sphericity to measure the fitness of our sample, which consisted of women who gave birth (vaginal or cesarean section). A KMO coefficient below 0.50 indicates no fit, 0.50-0.59 indicates weak fitness, 0.60-0.69 indicates moderate fitness, 0.70-0.79 indicates good fitness, 0.80–0.89 indicates very good fitness, and 0.90–1.00 indicates excellent fitness (11).

In Bartlett's test of sphericity, which tests the null hypothesis that the correlation matrix is an identity matrix, a p-value less than 0.05 indicates that the scale is appropriate for factor analysis (12). In the current study, the sample and the data set selected for the ObsQoR-11/TR were found to have a very good fitness for factor analysis. When determining the number of factors during a construct validity test, the Eigenvalue should be greater than 1 and at least 40% of the total variance should be explained (13).

The two-factor structure obtained here explained the variance at an adequate level (69.39%). Moreover, our construct validity measurements (ObsQoR-11/TR) preserved the original scale's two-factor structure and item content (ObsQoR-11). Also, the factor loads of all items were at a good level (0.774-0.898), except for item 1 (0.490). The literature often recommends that the factor loads of scale items should be at least 0.45 (5, 14). Some researchers highlight that a limit of 0.3 can be considered for factor loads (5, 15).

The findings we obtained seem to meet these criteria. Hotelling's t-squared test examines the similarities between mean item scores. According to our Hotelling's t-squared test, the results were significant. If the mean item scores differ significantly, the relevant items measure different subscales (9). In the current study, the mean item scores differed between different factors and were similar within the same factor. Also, there were either weak correlations or no correlation between items belonging to different factors, while there were strong correlations between items belonging to the same factor. This indicates that the scale's structure explains at least two different subscales. Cronbach's alpha coefficient is used to determine the reliability and consistency of scales. For excellent reliability, Cronbach's alpha coefficient should range from 0.80 to 1.00 and for high reliability, it should range from 0.60 to 0.79 (9). Cronbach's alpha value for the ObsQoR-11/TR was found to be high (0.781) for the whole scale and excellent for factor 1 (0.850) and factor 2 (0.920). A confirmatory factor analysis allows one to measure the correlations between the items and the factors formed by exploratory factor analysis, determine which items are related to which factor, reveal whether the factors are independent from each other, and assess whether the items and factors are sufficient to explain the observed variables in the model (16)..

A confirmatory factor analysis should examine model fitness values to determine a scale's fitness. For a model to be considered fit, the chi-squared/degree of freedom ($\chi 2$/sd) value should be lower than 3, RMSEA lower than 0.10, AGFI greater than 0.80, and the CFI, GFI, IFI, and TLI values greater than 0.90 (17). Given the model fitness values obtained here, we concluded that the scale displayed a good level of fitness and was acceptable.

We also investigated the effects of socio-demographic characteristics and variables associated with pregnancy and delivery on recovery levels at the 24th hour after birth. Accordingly, the cesarean section group reported being healthier in terms of factor 1 items (moderate-severe pain, nausea, vomiting, dizziness, shaking), while the normal delivery group felt healthier in terms of factor 2 items (feeling comfortable and meeting all their needs independently at the time of the questionnaire).

Strengths and Limitations

The scale was implemented through face-to-face interviews, and it can be applied to women after either vaginal delivery or cesarean section, which constitute the strengths of the current study. One of the limitations was that the participants were not retested after 24 hours for reliability (because we believed that recovery levels could change in the future, impairing consistency). Because this study focused on testing the scale for validity and reliability, we recommend further research to measure recovery at different times.

CONCLUSION

In conclusion, our validity and reliability analyses have revealed that the ObsQoR-11/TR, a scale that consists of 2 factors and 9 items, can be applied to mothers after either

vaginal delivery or cesarean section and is valid and reliable for Turkish society. Moreover, the items of each factor should be evaluated among themselves. The whole scale is an 11-point Likert-type scale. The first factor (i1, i2, i3, i4, i5) is scored in reverse and should sum to a score ranging from 0 to 50, while the second factor (i6, i7, i8, i9, i10, i11) should sum to a score ranging from 0 to 60. Hence, higher scores indicate better postpartum recovery levels. Besides, note that the ObsQoR-11/TR does not have a cutoff point. Table 5 shows the ObsQoR-11/TR.

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Author Contributions: Önal Ö, Gürlek B, Küçükosman N: study conceptualization, protocol planning, clinical data collection and supervision**. Önal Ö, Gürlek B:** manuscript writing/editing. **Önal Ö:** clinical data analysis. The authors alone are responsible for the content and writing of the paper.

Ethical approval: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions. Informed consent or substitute for it was obtained from all patients for being included in the study.

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