

Validation of translated Obstetric Quality of Recovery (ObsQoR-10A) score after nonelective cesarean delivery (CD) in an Arabic-speaking population

ABSTRACT

Background: The ObsQoR-11 is a validated scale that assesses recovery after cesarean delivery (CD). This observational study aimed to evaluate the psychometric properties of its Arabic version.

Methods: The original ObsQoR-11 was translated into an Arabic version (ObsQoR-10A). All participants completed the ObsQoR-10A at 24 h and 48 h postoperatively after CD. Validity, reliability, responsiveness, and feasibility were assessed.

Results: The ObsQoR-10A correlated with Global Health Numerical Rating Scale (NRS) at 24 h ($R = 0.68$, 95% CI: 0.56–0.80, $P < 0.001$) and at 48 h ($R = 0.66$, 95% CI: 0.54–0.78, $P < 0.001$) and differentiated between good and poor recovery (median scores at 24 h 88 vs. 71, $P < 0.001$; at 48 h 95.5 vs. 70, $P < 0.001$). ObsQoR-10A correlated with hospital length of stay at 24 h ($R = -0.21$, 95% CI: -0.40 to -0.02, $P = 0.03$) and at 48 h ($R = -0.21$, 95% CI: -0.40 to -0.03, $P = 0.02$); gestational age at 24 h ($R = 0.22$, 95% CI: 0.03–0.40, $P = 0.02$); change in hemoglobin at 24 h ($R = -0.30$, 95% CI: 0.51 to -0.10, $P < 0.01$); and total opioids at 48 h ($R = -0.45$, 95% CI: -0.62 to -0.27, $P < 0.001$). There was a significant difference between 24 h and 48 h postoperative ObsQoR-10A scores (median difference: -18; $P < 0.001$ which shows responsiveness). Other key measures included a Cronbach's alpha of 0.87, split-half 0.75, and intra-class correlation >0.62 with no floor or ceiling effects. Median (IQR) completion time was 3 (3-5) and 3 (2.5-3.5) minutes at 24 h and 48 h.

Conclusions: ObsQoR-10A is a valid, reliable, responsive, and a clinically feasible tool in an Arabic-speaking obstetric population.

Key words: Cesarean delivery, ObsQoR, patient-reported outcome measure, postoperative, quality of recover

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Introduction

A return to a normal state after cesarean delivery (CD) takes a multifaceted course, subject to the type of anesthetic given to the patient, surgical outcomes, and postoperative complications.^[1] Although mortality and morbidity are significant factors that determine patient safety and recovery outcomes, they fail to convey patient perspectives^[2] that include their emotional well-being and, most importantly, the quality of recovery from their procedure.

Patient-reported outcome measures (PROMS) are considered as the benchmark for evaluating postoperative recovery and global health status.^[3] PROMS assess patient symptoms using multiple outcome domains from the patient's perspective,^[4,5] which can be utilized to measure the patient's personal viewpoint of the quality of recovery after a surgical procedure.^[6] These outcome measures play a fundamental role in the assessment and improvement of the quality of care^[7] as well as in the advancement of future clinical research.^[6]

A recent systematic review acknowledged that Obstetric Quality of Recovery-11 (ObsQoR-11) PROMS have been explicitly designed to assess the quality of inpatient postpartum recovery.^[5] S. Ciechanowicz *et al.*^[2] developed and evaluated 11-item PROMS after modifying the QoR-40 score^[8] which was later found to be reliable, valid, and responsive. In response to patient's feedback, they further recommended to modify the PROMS into the 10-item "ObsQoR-10" for future validation studies to determine its extent of generalizability internationally.^[9]

The ObsQoR-10 has been found to be a reliable and valid instrument both in the United Kingdom^[10] and United states^[3]; however, it needs to be externally validated in distinctive cultures or languages and other health care settings.^[3,9,5]

The aim of the study is to translate and culturally adapt the original English versions of the ObsQoR^[2,9] into an Arabic version, referred to here as "ObsQoR-10A" and then assess its validity, reliability, responsiveness, and clinical feasibility after nonelective CD in a cohort of Arabic-speaking obstetric patients. We hypothesized that the ObsQoR-10A would have psychometric properties used for assessing the postoperative recovery of the obstetric patients would be similar to the original ObsQoR applied to English-speaking populations.^[2,9]

Methods

We conducted a monocentric, observational prospective study at King Abdulaziz Hospital, Ministry of National Guards

Health Affairs (MNGHA), Al-Ahsa, Saudi Arabia. The study protocol (Ref: RA19/010/A) was approved on June 24, 2019 by the Institutional Review Board (IRB) of King Abdullah International Medical Research Centre (KAIMRC), Saudi Arabia.

All term women undergoing nonelective CD between February 2020 and July 2020 were enrolled in the study. The classification of urgency of cesarean was categorized according to the guidelines of the Royal College of Obstetricians and Gynecologists and the Royal College of Anesthetists, UK, respectively.^[11] Inclusion criteria included all women greater than or equal to 37 weeks' gestational age, who were undergoing nonelective CD under neuraxial anesthesia. We did not include women who refused or who were aged below 18 years.

Translation and cultural adaptation

The original English version of the ObsQoR-11^[2,9] was translated and culturally adapted into an Arabic version "ObsQoR-10A." Four (two coauthors: I.A.M.A. and A.Y.A.) independent investigators, fluent in Arabic and English language, translated the English questionnaires according to the forward translation/backward translation method.^[12,13] The translated final Arabic version was then tested in a cohort of randomly selected obstetric patients who were native Arabs.

Throughout the study phase, recruitment days were paralleled to the investigator availability, while recruitment time was limited to nonelective CDs performed during 08:00–20:00 hours.

After obtaining written informed consent, the demographic and clinical data, including the obstetric, anesthetic, and neonatal variables, were collected. The study participants were then requested to complete the ObsQoR-10A PROM (Appendix 1), rating each recovery item on an 11-point numerical Likert-type scale (0 = *strongly negative*; 10 = *strongly positive*). In addition, they were also asked to rate their general health condition using a global health numerical rating scale (NRS; Appendix 2), depicted as a 100-mm line and ruler, with "*sad*" or "*happy*" pictures at each end. This process was completed at two time points, at 24 h and 48 h postoperatively after their CD. For test–retest reliability,^[14] a random subset of 50 patients were further examined to complete another ObsQoR-10A questionnaire and global health NRS at 25 h postoperatively after their CD.

The psychometric validation of the ObsQoR-10A score included the following:

1. **Validity:**
 - a. **Convergent validity:** Correlation of ObsQoR-10A scores with global health NRS scores at 24 h and 48 h postoperatively after CD.
 - b. **Discriminant validity:** Comparison of ObsQoR-10A scores with global health NRS scores of ≥ 70 versus < 70 mm at 24 h and 48 h postoperatively after CD.
 - c. **Content validity:** Correlation of ObsQoR-10A scores at 24 h and 48 h postoperatively after CD with length of hospital stay (LOS in hours), maternal age (< 30 years vs. > 35 years), body mass index (BMI), parity, gestational age (in weeks), gestation (singleton vs. multiple), previous CD, urgency of surgery (category 1–3), duration of surgery, estimated blood loss (EBL) during surgery (< 500 mL versus > 1 L), pre- and post-operative hemoglobin concentration, and changes in hemoglobin concentration (pre- to post-operative on day 1). In addition, neonatal location (admission in neonatal intensive care unit [NICU] vs. in neonatal ward), neonatal clinical condition (Not ok vs. Ok), and cumulative opioid consumption for rescue analgesia were also analyzed. The total opioid dose comprised of oral morphine and tramadol, respectively. Each milligram of oral tramadol was considered equal to 0.1 mg oral milligram morphine equivalents (MMEQ).^[15]
2. **Reliability:**
 - a. **Internal consistency:** Measured using Cronbach's alpha and inter-item correlation tests for all the patients at 24 h and 48 h postoperatively after CD. Split-half reliability is evaluated by studying the correlation between random split segments of ObsQoR-10A items at 24 h postoperatively after CD.
 - b. **Test-retest reliability:** All (100) women were part of the study; however, only half (50) of them were selected by computer-generated randomization to repeat the questionnaire 60 min later (at 25 h postoperatively after CD) to assess correlation to 24-h responses and to assess test-retest reliability.
 - c. **Floor and ceiling effects:** Assessed by quantifying whether $< 15\%$ respondents achieved highest (100) or lowest (0) possible scores at 24 h and 48 h postoperatively after CD.
3. **Responsiveness:** Comparison of ObsQoR-10A scores at 24 h versus 48 h postoperatively after CD in the same women using paired statistics.
4. **Acceptability and feasibility:**
 - (a) Patient recruitment rate.
 - (b) Successful completion rate and time taken to complete the questionnaire at 24 h and 48 h postoperatively after CD.

Statistical analysis

According to the previous published studies,^[9,14] the sample size calculation is not considered to be accurate or consistent for correlation analysis; therefore, it was set similar to the closest matched "ObsQoR-11 nonelective caesarian delivery study" and hence included 100 participants in our study.

Data were presented as mean (Standard deviation [SD]), median (Inter-quartile range [IQR]), number (Percentage), and 95% confidence intervals (CI), as appropriate. Continuous data were tested for normality using the Shapiro–Wilk and Kolmogorov–Smirnov normality tests and quantile-quantile diagrams; parametric data were compared using paired *T*-test while nonparametric data were compared using the Wilcoxon–Mann–Whitney test. Correlations between the ObsQoR-10A and global health NRS scores were determined using Spearman's correlation coefficient (*R*). Internal consistency was measured using Cronbach's alpha and inter-item correlation tests. The test-retest reliability was assessed by intra-class correlation coefficient. Split-half reliability was calculated using Spearman Brown adjustment. A two-tailed *P* value of < 0.05 was used to reject the null hypothesis. All statistical analyses were performed using Stata/IC for Mac Version 16.1 (StataCorp, College Station, TX, USA).

Results

Overall, 100 term women were enrolled in the present study. There were no dropouts and, therefore, no exclusions from the analysis. Women's demographics and clinical characteristics are summarized in Table 1.

Validity

Convergent validity at 24 h after CD ($R = 0.68$, 95% CI: 0.56–0.80, $P < 0.001$) and 48 h after CD ($R = 0.66$, 95% CI: 0.54–0.78, $P < 0.001$) was found to be strong. Summary of correlations of specific ObsQoR-10A items to global health NRS scores are shown in Table 2.

Discriminant validity was also found to be statistically significant. At 24 h after CD, median ObsQoR-10A score for good recovery was 88 (74–96) compared to poor recovery's score of 71 (54–80, $P < 0.001$). At 48 h after CD, median ObsQoR-10A score for good recovery was 95.5 (87–99), and a score of 70 (63–78, $P < 0.001$) indicated poor recovery.

There was a weak negative correlation of ObsQoR-10A scores with LOS at 24 h after CD ($R = -0.21$, 95% CI: -0.40 to -0.02 , $P = 0.03$) and 48 h after CD ($R = -0.21$, 95% CI: -0.40 to -0.03 , $P = 0.020$), signifying that higher recovery scores were linked to a shorter LOS. The median (IQR) LOS for women was

Table 1: Women demographics and clinical characteristics. Data are presented as mean (SD), median (IQR), or number (%)

Patient Demographics	
Age in years	
Mean±SD	30.13±6.1
Range	18-42
Body Mass Index (kg/m ²)	
Median (IQR)	32.3 (29.6-37.5)
Range	22.8-51.0
Parity (%)	
0	12
1	25
2	20
3	17
≥4	26
Gestation (%)	
Single	94
Multiple	06
Previous CD (%)	
Yes	57
No	43
Obstetric variables	
Obstetric indications for CD (%)	
Pathological CTG	39
Previous CD	21
Failure to progress	14
Breech	11
Failed IOL	8
Preeclampsia	5
Uncontrolled DM	2
Category of emergency CD (%)	
1	52
2	31
3	17
Length of hospital stay—LOS (h)	
Median (IQR)	72 (60-90)
Range	48-144
Duration of surgery (min)	
Median (IQR)	51.5 (42-60)
Estimated blood loss (%)	
≤ 500 ml	59
≥ 1000 ml	41
Change in Hb	
Median (IQR)	0.8 (0.3-1.5)
Preexisting medical condition (%)	
Respiratory	7
Cardiovascular	5
Neurological	0
Endocrinology	16
Hematological	12
Musculoskeletal	0
Psychiatric	1
Others	8
Anesthetic variables	
Technique (%)	
Spinal	95
Epidural top-up	5

Table 1: Contd...

Anesthetic variables	
Total opioid consumption in 48 h after CD (MMEQ)*	0 (0-15)
Median (IQR)	
Neonatal variables	
NICU admissions (%)	26
Clinical condition Not Ok** (%)	22

n = 100; SD—standard deviation; IQR—interquartile range; CD—cesarean delivery; CTG—cardiotocograph; IOL—induction of labor; DM—diabetes mellitus; EBL—estimated blood loss; change in Hb—it is the difference between pre- and day 1 postoperative Hemoglobin concentration; NICU—neonatal intensive care unit. *MMEQ—milligram morphine equivalents. The total opioid dose included oral morphine and tramadol. Each milligram of oral tramadol was considered equal to 0.1 mg oral MMEQ. **Low birth weight <1800 gm, small for gestation <34 weeks or any other illness.

72 (60–90) hours with a range of 48–144 h. A weak positive correlation of ObsQoR-10A scores with gestational age at 24 h after CD ($R = 0.22$, 95% CI: 0.03–0.40, $P = 0.02$) was disclosed. A weak negative correlation of ObsQoR-10A scores with a change in Hb concentration at 24 h after CD ($R = -0.30$, 95% CI: -0.51 to 0.10, $P < 0.01$) was found. The ObsQoR-10A scores of women showed moderate inverse correlation with total opioid usage at 48 h after CD ($R = -0.45$, 95% CI: -0.62 to -0.27, $P < 0.001$). The median (IQR) total opioid consumption for rescue analgesia at 48 h after CD was 0 (0–15) MMEQ. No significant correlation was seen with any other clinical aspects in this study that included parity, gestation (single vs. twins), maternal age, BMI, category of CD, previous CD, pre- and post-Hb concentration, EBL, and duration of surgery [Table 3].

In addition, there was a significant difference in the median (IQR) scores for neonatal location (NICU vs. neonatal ward) at 24 h after CD (70.5 [64–75] vs. 78.5 [57–89], $P = 0.02$) and at 48 h after CD (78 [72–80] vs. 96 [89–99], $P < 0.001$). Similarly, a significant difference in the median (IQR) scores based on neonatal condition (Not Ok vs. Ok) at 24 h after CD (70 [64–75] vs. 76.5 [64–89], $P = 0.02$) and at 48 h after CD (78 [72–93] vs. 95 [88–99], $P < 0.001$) was found.

Reliability

Internal consistency was high (>0.80) at both time points, including 0.87 at 24 h and 0.81 at 48 h, respectively, after CD. Similarly, *inter-item correlations* at 24 h and 48 h, respectively, after CD were predominantly between 0.15 and 0.50, which is a good indicator of consistency as summarized in [Table 4]. *Split-half reliability* with Spearman Brown adjustment at 24 h after CD was 0.75, entailing an equal contribution from all items.

The *test–retest ICC* of ObsQoR-10A scores (24 h vs. 25 h, respectively, after CD) was >0.62 (range 0.62–0.94) for all items signifying sufficient repeatability [Table 5].

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Table 2: Summary of correlations of ObsQoR-10A items to global health (NRS) score at 24 h and 48 h after CD

ObsQoR-10A Items	Correlation to global health NRS score*			
	Spearman's <i>R</i> (95% CI) 24 h	<i>P</i>	Spearman's <i>R</i> (95% CI) 48 h	<i>P</i>
1—Pain	0.37 (0.18-0.56)	<0.001	0.59 (0.45-0.74)	<0.001
2—Nausea or vomiting	0.31 (0.12-0.50)	0.001	0.24 (0.06-0.42)	0.009
3—Dizziness	0.39 (0.21-0.57)	<0.001	0.38 (0.18-0.58)	<0.001
4—Shivering	0.19 (-0.01-0.39)	0.066	0.12 (-0.09-0.33)	0.248
5—I have been comfortable	0.56 (0.41-0.70)	<0.001	0.45 (0.28-0.61)	<0.001
6—I am able to mobilize independently	0.45 (0.29-0.62)	<0.001	0.44 (0.28-0.59)	<0.001
7—I can hold a baby without assistance	0.47 (0.31-0.64)	<0.001	0.47 (0.31-0.64)	<0.001
8—I can feed/nurse my baby without assistance	0.38 (0.20-0.56)	<0.001	0.45 (0.28-0.62)	<0.001
9—I can look after my personal hygiene/toilet	0.48 (0.33-0.64)	<0.001	0.49 (0.34-0.63)	<0.001
10—I feel in control	0.52 (0.37-0.67)	<0.001	0.49 (0.33-0.65)	<0.001

ObsQoR-10A: Obstetric Quality of Recovery-10 (Arabic version); CD—cesarean delivery. *Global Health Numerical Rating Scale (NRS).

Table 3: Summary of correlations of clinical characteristics to ObsQoR-10A score

Clinical characteristics	Correlation to ObsQoR-10A			
	Spearman's <i>R</i> (95% CI) 24 h	<i>P</i>	Spearman's <i>R</i> (95% CI) 48 h	<i>P</i>
LOS	-0.21 (-0.41 to -0.02)	0.03	-0.21 (-0.40 to -0.03)	0.03
Parity	-0.03 (-0.23 to 0.17)	0.79	0.09 (-0.11 to 0.29)	0.39
Gestational age	0.22 (0.03 to 0.40)	0.02	0.12 (-0.09 to 0.32)	0.27
Gestation (singleton vs. twins)	-0.001 (-0.18 to 0.18)	0.99	0.18 (-0.05 to 0.40)	0.12
Maternal age	-0.003 (-0.20 to 0.19)	0.98	0.07 (-0.11 to 0.27)	0.43
BMI	-0.04 (-0.22 to 0.14)	0.68	0.10 (-0.10 to 0.30)	0.33
Category of CD	0.05 (-0.14 to 0.25)	0.59	0.11 (-0.08 to 0.30)	0.26
Previous CD	0.10 (-0.09 to 0.30)	0.30	0.08 (-0.11 to 0.28)	0.41
Duration of surgery	0.03 (-0.17 to 0.23)	0.76	-0.02 (-0.22 to 0.19)	0.86
EBL	-0.10 (-0.30 to 0.10)	0.34	-0.09 (-0.29 to 0.12)	0.41
Pre-Hb	-0.18 (-0.38 to 0.01)	0.06	-0.19 (-0.39 to 0.003)	0.05
Post-Hb	-0.07 (-0.29 to 0.16)	0.56	-0.03 (-0.27 to 0.20)	0.78
Change in Hb	-0.30 (-0.51 to -0.10)	0.003	-0.28 (-0.48 to -0.08)	0.006
Total opioid usage	-0.71 (-0.84 to -0.59)	<0.001	-0.45 (-0.62 to -0.27)	<0.001

ObsQoR-10A: Obstetric Quality of Recovery-10 (Arabic version); LOS—length of stay (hours); BMI—body mass index; CD—cesarean delivery; EBL—estimated blood loss; Pre-Hb—preoperative hemoglobin concentration; Post-Hb—postoperative hemoglobin concentration; Change in Hb—difference between pre- and post-operative hemoglobin concentrations.

At 24 h after CD, no floor or ceiling effects of the scoring tool were demonstrated, as the proportion of women attaining the highest feasible and lowest ObsQoR-10A scores were 2% ($n = 2/100$) each, respectively. However, at 48 h after CD the percentage of women with highest possible and lowest ObsQoR-10A scores was 16% ($n = 16/100$) and 1% ($n = 1/100$), respectively. The negative skewness of the ObsQoR-10A scores was -1.08 at 24 h and -0.90 at 48 h after CD, demonstrating that the bulk of the ObsQoR-10A scores were in the upper half of the scale [Figure 1a]. Box plots of total ObsQoR-10A scores at each study time point are presented in [Figure 1b].

Responsiveness

Median (IQR) ObsQoR-10A scores at 48 h postoperatively after CD were significantly higher 93 (78–98) when compared to ObsQoR-10A scores at 24 h postoperatively after CD 75 (64–87, $P < 0.001$).

Acceptability and feasibility

The *recruitment rate* was 100% at 24 h and 48 h after CD. Half (50) of these participants repeated the questionnaire at 25 h after CD.

The median (IQR) time taken to complete the ObsQoR-10A questionnaire was 3 (3–5) min, with a range from 2 to 8 min at 24 h after CD and 3 (2.5–3.5) min, with a range from 2 to 6 min at 48 h after CD.

Discussion

Main findings

Our study demonstrates that ObsQoR-10A is a valid, reliable, and feasible PROM for use in this cohort of Arabic-speaking population following nonelective CD. Higher ObsQoR-10A scores were associated with a shorter hospital LOS. A moderate inverse correlation between

Table 4: Inter-item correlation matrix for ObsQoR-10A following nonelective caesarean delivery at 24 h and 48 h postoperatively

Inter-item correlation matrix for ObsQoR-10A following nonelective CD—24 h												
ObsQoR-10A Question number	Global health NRS*	Total ObsQoR-10A Score	1	2	3	4	5	6	7	8	9	10
1	0.3755	0.3868	1									
2	0.4276	0.7694	0.2862	1								
3	0.4412	0.7884	0.2136	0.8262	1							
4	0.2864	0.6275	0.1679	0.7899	0.6798	1						
5	0.608	0.5978	0.3963	0.3686	0.346	0.1792	1					
6	0.5085	0.8277	0.3034	0.595	0.6272	0.464	0.5972	1				
7	0.4623	0.6415	0.1199	0.2628	0.313	0.1517	0.202	0.3275	1			
8	0.4109	0.5906	0.1123	0.223	0.2715	0.1154	0.1536	0.2322	0.9611	1		
9	0.5079	0.8211	0.1893	0.52	0.6043	0.422	0.5183	0.8546	0.3614	0.3091	1	
10	0.5564	0.8121	0.232	0.5392	0.5937	0.4354	0.6134	0.8029	0.305	0.2618	0.8963	1

Inter-item correlation matrix for ObsQoR-10A following nonelective CD—48 h												
ObsQoR-10A Question number	Global health NRS*	Total ObsQoR-10A Score	1	2	3	4	5	6	7	8	9	10
1	0.5956	0.5996	1									
2	0.2898	0.281	0.1464	1								
3	0.5202	0.6242	0.4095	0.4448	1							
4	0.2268	0.3609	0.1558	0.3667	0.4666	1						
5	0.4322	0.5038	0.4172	0.1194	0.3742	0.2714	1					
6	0.3881	0.545	0.397	0.132	0.2977	0.2883	0.4328	1				
7	0.4395	0.8255	0.2583	0.0284	0.2789	0.06	0.2407	0.2428	1			
8	0.4308	0.8091	0.2892	0.0386	0.2795	0.0028	0.1909	0.2084	0.9783	1		
9	0.537	0.5219	0.3794	0.2102	0.4237	0.3234	0.1298	0.4468	0.1712	0.154	1	
10	0.6168	0.8121	0.4389	0.2147	0.5391	0.2992	0.3018	0.4713	0.2679	0.2221	0.8191	1

ObsQoR-10A: Obstetric Quality of Recovery-10 (Arabic version); CD: cesarean delivery; Question number: 1—pain; 2—nausea or vomiting; 3—dizziness; 4—shivering; 5—have been comfortable; 6—able to mobilize independently; 7—can hold baby without assistance; 8—can feed/nurse baby without assistance; 9—can look after personal hygiene/toilet; 10—feeling in control. *Global Health Numerical Rating Scale (NRS).

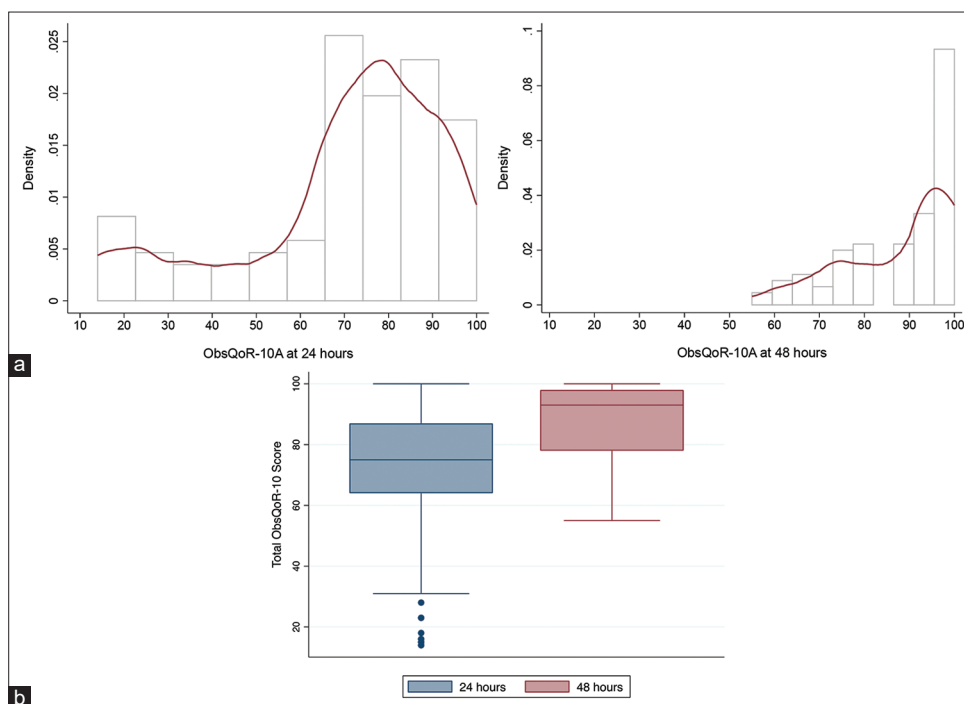


Figure 1: (a and b) Histogram and kernel density plot (solid curve) of ObsQoR-10A scores at 24 h and 48 h after cesarean delivery (CD). (b) Box and Whisker plot of ObsQoR-10A scores at 24 h and 48 h after CD. Box plot shows median (IQR) of ObsQoR-10A scores at 24 h 75 (64–87 [14–100]) and at 48 h 93 (78–98 [55–100]), respectively, after CD. Round symbols show the outliers

Table 5: Test-retest reliability for ObsQoR-10A items after CD

ObsQoR-10A items	Intra-class correlation coefficients 24 h vs. 25 h*
1—Pain	0.7395
2—Nausea or vomiting	0.6297
3—Dizziness	0.8378
4—Shivering	0.6584
5—I have been comfortable	0.8244
6—I am able to mobilize independently	0.8453
7—I can hold a baby without assistance	0.8740
8—I can feed/nurse my baby without assistance	0.9420
9—I can look after my personal hygiene/toilet	0.8233
10—I feel in control	0.8940
Total ObsQoR—10A	0.8643

* ObsQoR-10A scores 24 h vs. 25 h, respectively, after CD. Spearman's rank-order correlation >0.62 in all items indicates good reliability of the instrument. ObsQoR-10A: Obstetric Quality of Recovery-10 (Arabic version); CD—cesarean delivery

ObsQoR-10A scores and change in Hb concentration and a weak positive correlation with gestational age were found. The ObsQoR-10A scores of mothers with babies in NICU were significantly lower than those in the neonatal ward. Last, ObsQoR-10A scores correlated inversely with the total opioid usage.

Interpretation

The convergent validity of >0.6, recognized as a standard for health-rating scales,^[16] was in line with the results of S. Ciechanowicz *et al.*^[9] The results of discriminant validity in this group of women were also similar to the nonelective CD original English version.^[9] However, the scores of our study were lower when compared to the elective CD^[2] as emergency surgeries are prone to more risks when compared with elective surgeries.

The proportion of > 15% was considered significant to identify the floor or ceiling effect of the ObsQoR-10A scoring tool.^[17] Like the previous study,^[9] this effect was not observed at 24 h after CD. However, a ceiling effect was found at 48 h after CD, which is an expected phenomenon as women continue to feel better after recovering from their surgeries.^[18]

LOS is accepted as a key quality marker,^[19] and we found that higher ObsQoR-10A scores were linked to a shorter LOS. The strength of correlation was found to be much weaker than elective CD,^[2] but the results are consistent with the previous study.^[9] The weak correlation could be due to greater variation among the cases presented as nonelective CD. A combination of both clinical and nonclinical factors should be explored in future studies.

There was a moderate inverse correlation between a change in Hb concentration with ObsQoR-10A scores at 24 h after CD. Overall, mean preoperative Hb level was 10.9 g/dL (95% CI: 10.5–11.2) and mean postoperative Hb level was 9.9 g/dL (95% CI: 9.6–10.3), and the difference was statistically significant at $P < 0.001$; this suggests that women with a drop in Hb level were likely to become anemic. Several studies support the development of postpartum depression in new mothers who are anemic, and this could possibly impact the quality of recovery scores.^[20]

Unlike the previous study that did not show any association with gestational age,^[9] the weak positive correlation with gestational age may indicate that these mothers may require some psychological support.^[21] Our study did not find any correlation with parity as observed by Ciechanowicz S and colleagues^[9]; however, the outcomes are in line with the results reported by Pereira TRC.^[22]

The ObsQoR-10A scores of mothers with babies admitted in NICU were significantly lower than those mothers whose babies were admitted in the neonatal ward at 24 h and 48 h. These results support the fact that the NICU environment is intrinsically psychologically upsetting for parents.^[23,24] Similarly, the ObsQoR-10A scores of mothers with healthy babies were significantly higher than those with unwell babies at both time points. Identification of vulnerable mothers could allow early interventional strategies to reduce stress.

ObsQoR-10A scores inversely correlated with total opioid usage, indicating that insufficient pain management encouraged more opioid consumption and depression that could possibly result in low scores.^[25,26] Future studies must analyze other non-opioid adjuvants to fully investigate this relationship.

Like the previous study,^[9] no significant association was found with any other variables in this study. Cultural differences, fewer complications, or the sample size could be the likely explanations. Future studies with large samples must negate the existing findings.

The results indicate that most women's ObsQoR-10A scores improved by 48 h after CD. It has been suggested that the intensity of abdominal pain after CD diminishes within 48 h in most patients,^[27] resuming to preoperative scores by 48 h.^[18] In addition, it is also considered as a standard discharge time.^[28] No improvement by this time could allow health professionals to take necessary actions.

Strengths and limitations

Unlike the previous study that did not capture responsiveness,^[9] in this study we were able to detect

clinically important differences between ObsQoR-10A scores at 48 h vs. 24 h postoperatively after CD, and this, therefore, we consider to be one main strength of this study. ObsQoR-10A scores at 48 h postoperatively after CD were found to be higher when compared to 24 h postoperatively after CD, which is line with other studies.^[2,8,14]

Inter-item correlation matrix was largely in the ideal range of 0.15 to 0.50,^[29] and internal consistency attained the suggested value (0.7–0.9)^[9,16] and was similar to those stated for QoR-15^[14] and QoR-40.^[8] Test–retest reliability was good with $r_i > 0.6$ for all items signifying sufficient repeatability and reliability. Though, women agreeing to repeat the questionnaire made the study prone to selection bias and test–retest bias.

Our results indicate that the ObsQoR-10A scale is a clinically applicable tool in an Arabic-speaking population. The 100% response rate at 24 h and 48 h after CD and the relatively short time taken to complete the questionnaire exhibit the conciseness of the tool; this may also make it less vulnerable to nonresponse bias. The median (IQR) time taken to complete the ObsQoR-10A questionnaire was 1 min longer than that reported by previous studies in an English-speaking population.^[2,9] Future studies should investigate patient-related factors such as literacy or cultural limitations.

The study has several limitations. The results were acquired from a single university hospital in the Eastern Region of Saudi Arabia; therefore, generalizability of this study's findings in areas outside this setting is unknown. Due to logistical and staffing reasons, recruitment of patients was limited and only possible between 08:00–20:00 hours every day during the study period. As the patients did not complete the ObsQoR-10A questionnaires alone (since it was an investigator-directed interview), it was prone to administration bias. The translated pre-final Arabic version of the ObsQoR-10A questionnaires tested in a cohort of 35 obstetric patients has not been considered in the study, and thus does not find a mention in the Discussion section in this article, as the purpose of this step was to elucidate the lay response of the obstetric population. Although this very initial stage provided some understanding, it lacked in psychometric robustness and, therefore, the need of mentioning this cohort of patients was not considered mandatory. Last, the duration of labor before CD was not measured in this study, and we admit that it might have a substantial impact on ObsQoR scores from CD.

Conclusion

In conclusion, we have translated and culturally adapted the English ObsQoR instruments^[2,9] into Arabic. Our psychometric assessment of ObsQoR-10A scale has exhibited validity, reliability, and clinical feasibility in a population of Arabic-speaking mothers after their nonelective CD. We believe that ObsQoR-10A scale is a suitable tool to measure the health status of Arabic-speaking mothers as part of the augmented recovery- and research-related programs.

Author contributions

Dr. Shumaila Mukarram: This author helped in the study concept, study design, data analysis, data interpretation, writing up the first and final draft of the paper, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Shoukat Ali: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Muhammad Zulqurnain: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Ibtihal A M Alkadi: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Abdulelah I Alhatlan: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Mohammed Z H Abbasi: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Muhammad Q Mushtaq: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Ahmed Y AbuHammad: This author helped in participant recruitment, data collection, interpreting the data, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Khalida Shahid: This author helped in the study design, data interpretation, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Asghar Waqas: This author helped in the study design, data interpretation, and critical revision of draft papers. All authors read and approved the final manuscript.

Dr. Atif Shafqat: This author helped in the study concept, study design, participant recruitment, data collection, data analysis, data interpretation, writing up the final draft of the paper, and critical revision of draft papers. All authors read and approved the final manuscript.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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Appendixes

STUDY ID: _____

كيف كنت تشعر في الساعات الـ 24 الماضية ؟
(0 إلى 10 ، حيث: 0 = سيئ جدا و 10 = ممتاز)

أوافق بشدة → → → → لا أوافق أبدا

1. عندي ألم شديد	0	1	2	3	4	5	6	7	8	9	10		
2. عندي غثيان أو إقياء	0	1	2	3	4	5	6	7	8	9	10		
3. أشعر بالدوار	0	1	2	3	4	5	6	7	8	9	10		
4. كنت أرجف	0	1	2	3	4	5	6	7	8	9	10		

لا أوافق أبدا → → → → أوافق بشدة

5. لقد كنت مرتاحا	0	1	2	3	4	5	6	7	8	9	10		
6. أنا قادر على الحركة بشكل مستقل	0	1	2	3	4	5	6	7	8	9	10		
7. أستطيع أن أحمل الطفل دون مساعده	0	1	2	3	4	5	6	7	8	9	10		
8. يمكنني إرضاع طفلي بدون مساعده	0	1	2	3	4	5	6	7	8	9	10		
9. يمكنني أن أهتم بنظفتي الشخصية وأذهب إلى المرحاض	0	1	2	3	4	5	6	7	8	9	10		
10. أشعر في السيطرة	0	1	2	3	4	5	6	7	8	9	10		

Appendix 1: ObsQoR-10A PROM, rating each recovery item on a 11-point numerical Likert-type scale (0 = strongly negative; 10 = strongly positive)

يرجى وضع علامة بسهم أو تقاطع على المقياس أدناه كيف كنت تشعر خلال الـ 24 ساعة الماضية

0 10 20 30 40 50 60 70 80 90 100

أسوأ حالة صحية يمكن تخيلها أفضل حالة صحية يمكن تخيلها

Appendix 2: Global Health Numerical Rating Scale (NRS), depicted as a 100-mm line and ruler, with "sad" or "happy" pictures at each end