# Validation of Hindi version of the obstetric quality of recovery score-11 (ObsQoR-11 H) following elective caesarean section

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> Submitted: 29-Jan-2023 Revised: 06-Sep-2023 Accepted: 07-Sep-2023 Published: 21-Nov-2023

### Website: https://journals.lww. com/ijaweb DOI: 10.4103/ija.ija\_69\_23 Quick response code

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#### ABSTRACT

Background and Aims: Obstetric quality of recovery score-11 (ObsQoR-11) was developed in English to evaluate the quality of recovery in the caesarean section. We aimed to validate the Hindi version of ObsQoR-11 (ObsQoR-11H) for Hindi-speaking patients to evaluate the quality of recovery following the elective caesarean section. Methods: The ObsQoR-11 was translated into Hindi and assessed for validity, acceptability and feasibility. The questionnaire was administered postoperatively at 24 and 48 hours, and the Global Health Numeric Rating Scale (NRS) was used to evaluate recovery. Results: The mean (standard deviation [SD]) (95% confidence interval [CI]) ObsQoR-11 H was 75.94 (4.09)(95% CI 75.1, 76.7) and 80.25 (4.08)(95% CI 79.5, 81) at 24 and 48 hours, respectively. The mean (SD) (95%CI) Global Health NRS scores were 71.22 (5.97)(95% Cl 70, 72.4) and 77.37 (5.79)(95% Cl 76.2, 78.5) at 24 and 48 hours, respectively. Convergent validity showed a strong correlation between ObsQoR-11H and Global Health NRS (Spearman's correlation coefficient [r\_] >0.8 and 0.78) scores at 24 and 48 hours, respectively. Discriminant validity was significant in appreciating the difference between good and poor recovery (P < 0.001). Split-half coefficient of 0.69 and 0.65 and Cronbach's alpha ( $\alpha$ ) of 0.91 and 0.82 at 24 and 48 hours suggested good score reliability. The acceptability and feasibility of the score were also good. Conclusion: The ObsQoR-11H discriminated well between 'good' and 'poor' recovery and correlated strongly with Global Health NRS scores. It was found to be a valid, reliable, acceptable and feasible tool for psychometric recovery evaluation after elective caesarean section in Hindi-speaking women.

**Keywords:** Caesarean section, Global Health Numeric Rating Scale, obstetric quality of recovery score, patient-reported outcome measures, psychometrics, recovery

#### **INTRODUCTION**

Quality of recovery is an important measure to assess patients' early postoperative health status. Postpartum recovery after caesarean section depends on the patient, surgical and anaesthetic characteristics and the occurrence of postoperative complications. The obstetric quality of recovery (ObsQoR-11) score comprises five dimensions (11 items) of global recovery following the caesarean section.<sup>[1]</sup> Various confounding factors, such as cultural, educational, prior experiences and socioeconomic differences, might contribute to discrepancies in the perception

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How to cite this article: Gupta S, Choudhary S, Choudhary V, Jain K, Bhatia N, Gupta A. Validation of Hindi version of the obstetric quality of recovery score-11 (ObsQoR-11 H) following elective caesarean section. Indian J Anaesth 2023;67:S251-6.

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of the quality of recovery. Cross-cultural adaptation of existing questionnaires poses specific methodological problems related to the quality of translation and comparability among linguistically different groups. The ObsQoR-11 has been recommended as a valid, reliable and responsive tool to measure functional recovery up to 24 hours following a caesarean section. Hence, it is imperative to use more acceptable language with patients and healthcare providers in the Indian context, where diversity is the norm.<sup>[2,3]</sup> A Hindi version of ObsQoR-11 score (ObsQoR-11H) was only available in the literature search after the commencement of the study.<sup>[4]</sup> In this version, validation was performed at 24 hours only, while in the present study, validation was planned at 24 hours and 48 hours in simpler language. Therefore, we aimed to translate ObsQoR-11 into Hindi and validate it in the Hindi-speaking population regarding validity, reliability and acceptability.

#### **METHODS**

This prospective study was conducted in a tertiary care teaching hospital from January 2020 to June 2021, following the ethical principles laid down for medical research by the Declaration of Helsinki, 2013. This study was conducted after obtaining approval from the Institutional Ethics Committee (vide approval number GU/HREC/EC/2019/1792) and trial registration at the Clinical Trials Registry-India (vide registration number CTRI/2021/01/030739, www.ctri.nic.in). All patients gave written informed consent before enrolment.

In three steps, an existing English questionnaire was translated into a language suitable for the intended subset of patients. The initial translation from English to Hindi was performed by two translators (SC and SG), and another two independent translators performed backward translation. After completing the translation process, the questionnaire was critically reviewed by an expert committee.<sup>[5]</sup> After the committee agreed on all the items, the questionnaire was finalised (ObsQoR-11H scores) [Annexure 1]. The validation of the ObsQoR-11H questionnaire performed regarding validity, reliability was and acceptability. To analyse our cohort, using ObsQoR-11H, a pilot study was conducted on 20 patients in a similar setting to assess the feasibility of participant recruitment and study design; no weaknesses or logistical problems were encountered in the research instruments. Various guidelines have suggested a respondent-to-item ratio ranging from 5:1 to 10:1, which was the basis for enroling 120 patients. Subsequently, after the exclusion, the study was performed on 108 patients. $^{[5,6]}$ 

The study included women aged 18 to 40 years,  $\geq$  37 weeks of gestation and undergoing elective caesarean section under subarachnoid block. Exclusion criteria included patients with American Society of Anesthesiologists (ASA) physical statuses III and IV; neonatal intensive care admission at 24 hours (time of filling out questionnaire); twin pregnancies; inability to read, write or understand Hindi; and refusal to participate in the study. Recruitment of patients in the study was ensured as per investigator availability, and only patients undergoing caesarean section between 8 a.m. and 5 p.m. were included to avoid waking patients at odd hours to assess the ObsQoR-11H scores. Demographic and clinical characteristics such as age, body mass index, previous caesarean section, parity, gestation and duration of surgery were noted. ObsQoR-11H and the Global Health Numerical Rating Scale (NRS) (100mm) were explained to them for postoperative recovery assessment during routine pre-anaesthetic evaluation. On arrival in the operation theatre, baseline systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), mean arterial pressure (MAP), oxygen saturation (SpO<sub>2</sub>) and temperature were recorded with the patient in the supine position and ringer lactate at 15-20 mL/kg intravenous (IV) infusion was started. As per institutional protocol, caesarean deliveries were conducted under spinal anaesthesia with all aseptic precautions using a 25 G Quincke spinal needle with the patient in a sitting position or lateral position and 0.5% heavy bupivacaine 1.5 mL (7.5 mg) and fentanyl 0.5 mL (25µg) were injected. Postoperative analgesia was given IV diclofenac sodium 75mg 8 hours and paracetamol 0.45 g 6 hourly. Postoperative nausea and vomiting were managed by IV ondansetron 4mg whenever required. All the women were evaluated using the ObsQoR-11H scoring tool, an 11-point numerical Likert scale (0 = strongly negative;10 = strongly positive) assessed at 24 and 48 hours.

ObsQoR-11H scores were correlated with 100 mm Global Health NRS scores at 24 hours and 48 hours using the Spearman rank correlation coefficient to evaluate convergent validity. Global Health NRS measured general health status, represented by a 100 mm line marked at each end with the worst imaginable health status and sad face (0) to the best imaginable health status and happy face (100). Pearson's or Spearman's correlation coefficients were used to calculate correlations for normally and non-normally distributed data, respectively ( $r_{a} = 0.4$ -0.69: moderate correlation;  $r_s = 0.7-1.0$ : strong correlation).<sup>[7]</sup> Content validity was assessed using a correlation of ObsQoR-11H score and clinical characteristics such as parity, gestational age, body mass index, maternal age, surgical duration, prepost-haemoglobin and readiness to discharge. Good and poor recovery scores  $\geq$  70 vs. < 70mm NRS scores were compared in women for discriminant validity. Reliability as a measure of consistency was assessed using Cronbach's alpha ( $\alpha$ ), split-half reliability and intra-class correlation coefficient (ICC).Floor and ceiling effects were evaluated based on an extreme 15% of scores. Acceptability and feasibility were assessed based on the response rate and time used to complete the questionnaire. Statistical Package for the Social Sciences for Windows version 22(SPSS Inc., Chicago, Illinois, USA) was used for statistical analysis. The mean (standard deviation [SD]) was used to represent the quantitative data, while frequency and percent were used to represent the qualitative data. A *P* value <0.05 was considered significant.

#### RESULTS

A total of 120 women were enroled, and subsequently, 12 patients were excluded from the analysis; thus, 108 women were recruited over the study period. Eight

Table 1: Demographic charac	cteristics of the patients
Parameters	Measurements (n=100)
Parity	1 (1-0)
Gestational age (weeks)	37.79 (0.77)
Body mass index (kg/m <sup>2</sup> )	25.94 (2.53)
Maternal age (years)	28.81 (4.63)
Duration of surgery (minutes)	34.85 (6.17)
Data expressed as mean (standard deviati	on) or median (interguartile range)

parturients refused to respond at 48 hours; therefore, data from 100 women were finally analysed.

Baseline characteristics, including age, body mass index, gestational age, parity and duration of surgery, are given in Table 1. The correlation of patient demographics and obstetric characteristics with ObsQoR-11H scores was non-significant [Table 2].

The mean (SD) (95% confidence interval [CI]) ObsQoR-11H of women at 24 and 48 hours were 75.94 (4.09) (95% CI 75.1, 76.7) and 80.25 (4.08) (95% CI 79.5, 81), respectively. The Global Health NRS scores at 24 and 48 hours were 71.22 (5.97) (95% CI 70, 72.4) and 77.37 (5.79) (95% CI 76.2, 78.5), respectively.

The construct validity of ObsQoR-11H scores was assessed by two subtypes: convergent and discriminant validity. For convergent validity, the ObsQoR-11H scores were correlated with Global Health NRS scores at 24 and 48 hours. There was a strong correlation at 24 and 48 h (r<sub>s</sub> 0.80, 0.78; P < 0.001) [Table 3]. The study achieved the r<sub>s</sub>>0.6 value recommended for health scales, which indicates good convergent validity of ObsQoR-11H.

For discriminant validity, a comparison was made between the ObsQoR-11H scores in women with a 'good' or 'poor' postoperative recovery, defined by Global Health NRS scores <70 mm vs. >70 mm. Good discriminant validity was achieved in differentiating between a good recovery score (>70) and a poor recovery score (<70) at 24 hours and 48 hours (P < 0.001) [Table 4].

Using internal consistency, the reliability of ObsQoR-11H scores was evaluated by

Table 2: Correlation of	patient demographics and obstetric (conten	ic characteristic t validity)	s with ObsQoR-11H score at 24 h a	ind 48 h			
Clinical characteristics	At 24 h		At 48 h				
	Spearman's correlation (r <sub>s</sub> ) to ObsQoR-11H (95% CI)	Р	Spearman's correlation (r <sub>s</sub> ) to ObsQoR-11H (95% Cl)	Р			
Parity	0.15 (-0.05 to 0.34)	0.14	0.08 (-0.12 to 0.27)	0.44			
Gestational age	0.09 (-0.1 to 0.29)	0.33	0.12 (-0.08 to 0.31)	0.22			
Body mass index	-0.01 (-0.21 to 0.18)	0.90	-0.07 (-0.13 to 0.26)	0.47			
Maternal age	-0.004 (-0.20 to 0.19)	0.96	0.07 (-0.13 to 0.26)	0.51			
Duration of Surgery	-0.03 (-0.23 to 0.17)	0.75	-0.06 (-0.13 to 0.25)	0.53			
Preoperative Hb	0.04 (-0.14 to 0.23)	0.71	0.05 (-0.15 to 0.25)	0.59			
Postoperative Hb	-0.02 (-0.22 to 0.18)	0.84	-0.03 (-0.15 to 0.24)	0.80			
Change in Hb*	0.075 (-0.12 to 0.27)	0.46	0.17 (-0.03 to 0.35)	0.09			
Readiness to discharge	0.52 (-0.44 to 0.08)	<0.001	-0.49 (-0.63 to 0.32)	<0.001			

\*Change in haemoglobin (Hb) is the difference in haemoglobin from preoperative to postoperative values. ObsQoR-11H=Hindi version of the obstetric quality of recovery score-11, CI=Confidence interval

Table 3: Correlation of ObsQoR-11H a	nd Global Health NRS Scores at 24 h and 4	8 h (convergent validity)
Scores	At 24 h	At 48 h
ObsQoR-11H {Mean (SD)(95% CI)}	75.94 (4.09)(75.1 to 76.7)	80.25 (4.08)(79.5 to 81)
Global Health NRS {Mean (SD)(95% CI)}	71.22 (5.97)(70 to 72.4)	77.37 (5.79)(76.2 to78.5)
Spearman's correlation coefficient (rs)	0.80	0.78
Р	<0.001	<0.001

ObsQoR-11H=Hindi version of the obstetric quality of recovery score-11; NRS=Numeric rating scale; SD=Standard deviation; CI=Confidence interval

Table 4: Discriminant validity of ObsQoR-11H scores at24 h and 48 h								
ObsQoR-11 scores	At 24 h	At 48 h						
<70	14	5						
≥70	86	95						
Ρ	<0.001	< 0.001						

Values are expressed as numbers; ObsQoR-11H=Hindi version of the obstetric quality of recovery score-11

Table 5: Reliability of ObsQoF	R-11H at 24 h a	and 48 h
	At 24 h	At 48 h
Split-half test (Spearman–Brown)	0.69	0.65
Cronbach's alpha	0.91	0.82

ObsQoR-11H: Hindi version of the obstetric quality of recovery score-11

Cronbach'sα (0.8–0.9 indicates good reliability), which showed good reliability [Table 5]. Split-half reliability with the Spearman-Brown prophesy reliability estimate (measures the extent to which all parts of the test contribute equally) was >0.60at 24 and 48 hours, indicating good reliability [Table 5]. Inter-item comparison of ObsQoR-11H items at 24 and 48 hours showed a good ICC >0.45, suggesting reproducibility of the score [Table 6]. The ObsQoR-11H tool had a 100% response rate at 24hours and a >90% response rate at 48 hours, indicating good acceptability of the scoring tool. Only 7.5% of patients refused to participate and refill the questionnaire at 48 hours. The time taken to complete the questionnaire was 184.2 (40.36)(95% CI 176 to 192) seconds at 24 hours and 163.75 (42.22) (95% CI 155 to 172) seconds at 48 hours, respectively.

The proportion of patients achieving the highest (110) and lowest (0) possible QoR-11 score was 0/100, which was well within the acceptable limits of <15%. Thus, there was no floor or ceiling effect, proving the reliability of ObsQoR-11H scores.

#### DISCUSSION

Our study demonstrated that the ObsQoR-11H is a valid, reliable, acceptable and feasible tool to assess recovery at 24 and 48hours following elective caesarean section in Hindi-speaking women. The hypothesis was supported by a strong correlation of ObsQoR-11H with Global Health NRS scores, with correlation coefficients of 0.08 and 0.78 at 24 and 48hours, respectively. ObsQoR-11H recovery tool discriminated well between 'good' and 'poor' recovery.

The mean ObsQoR-11H scores of women at 24 and 48 hours strongly correlated with the Global Health NRS scores (P < 0.001). Higher ObsQoR-11H scores were associated with readiness for discharge in the present study at both 24 and 48hours, further supporting the use of this tool in clinical practice. The ObsQoR-11H scores were found to have good convergent validity, as indicated by  $r_s > 0.6$ . This value, indicating good convergent validity, has been recommended for health scales and has been corroborated by many studies.<sup>[1,8-12]</sup>

ObsQoR-11H score was able to differentiate between good and poor recovery in patients, similar to other studies. Furthermore, the wide variation in the values for 'good' and 'poor' recovery is influenced by socioeconomic, cultural and linguistic factors in a self-reported outcome tool<sup>[12,13]</sup>; hence, the perception of recovery may be affected by the aspect of recovery that the patient considers more significant to her well-being.<sup>[14]</sup> The Western scores thus cannot be implemented in toto in non-English speaking countries. The study noted improvement in score by 48 hours post caesarean delivery section, as pain intensity decreased and other parameters also improved subsequently. Mukarram et al. also reported significantly higher recovery scores at 48 hours compared to 24 hours.<sup>[15]</sup> The internal consistency, as measured using Cronbach'sa and split-half reliability with Spearman-Brown prophesy reliability estimate, was high and remained above the recommended levels (0.7-0.9) at both 24 and 48 hours,<sup>[16]</sup> which indicates good reliability of ObsQoR-11H.

On evaluating the strength of our study, we found that follow-up and reproducibility of ObsQoR-11H at 48hours were good for assessing recovery and patient improvement. Our study had certain limitations,

Table 6: ObsQol	R-11H intra-class correlation o	f recovery status at 24 and 4	8 h
ObsQoR-11H items	At 24 h Mean (SD) (95% Cl)	At 48 h Mean (SD) (95% Cl)	Spearman's correlation (intra-class correlation)
Moderate pain	7.08 (0.76)(6.93 to 7.23)	7.36 (0.76) (7.21 to7.51)	0.67
Severe pain	6.66 (0.73) (6.52 to 6.8)	7.07 (0.76) (6.92 to7.22)	0.74
Nausea/vomiting	9.17 (0.73) (9.03 to 9.31)	9.42 (0.59) (9.3 to 9.54)	0.74
Feeling dizzy	8.54 (0.63) (8.42 to 8.66)	9.13 (0.59) (9.01 to9.25)	0.45
Shivering	9.31 (0.64) (9.19 to 9.44)	9.39 (0.58) (9.28 to 9.5)	0.88
Have been comfortable	5.85 (0.73) (5.71 to 5.99)	7.27 (0.63) (7.15 to7.39)	0.99
Able to mobilise independently	4.18 (0.73) (4.04 to 4.32)	5.36 (0.78) (5.21 to5.51)	0.68
Can hold baby without assistance	5.02 (0.61) (4.9 to 5.14)	6.06 (0.86) (5.89 to 6.23)	0.60
Can feed/nurse baby without assistance	5.36 (0.63) (5.24 to 5.48)	5.37 (0.63) (5.25 to5.49)	0.98
Can look after personal hygiene/toilet	5.99 (0.63) (5.87 to 6.11)	6.01 (0.65) (5.88 to6.14)	0.95
Feeling in control	6.36 (0.75) (6.21 to 6.51)	7.25 (0.65) (7.12 to7.38)	0.85

ObsQoR-11H=Hindi version of the obstetric quality of recovery score-11, SD=Standard deviation, CI=Confidence interval

such as the exclusion of ASA physical status III and IV patients, small sample size and being a single-centric study, and it lacked generalisability. The reproducibility of the ObsQoR-11H scoring tool needs to be evaluated in other parts of the country, too, in a larger population, as India is a multilinguistic country, speaking different dialects with diverse cultural and socioeconomic backgrounds. The relationship between ObsQoR-11H and other markers of recovery and postoperative morbidity also needs to be evaluated and validated.

#### **CONCLUSION**

To conclude, the ObsQoR-11H tool discriminated well between 'good' and 'poor' recovery and correlated strongly with Global Health NRS scores. Hence, it is a valid, reliable, acceptable and feasible tool for psychometric evaluation of recovery in patients after elective caesarean section.

#### Study data availability

De-identified data may be requested with reasonable justification from the authors (email to the corresponding author) and shall be shared after approval as per the authors' institution policy.

#### Financial support and sponsorship

Nil.

#### **Conflicts of interest**

There are no conflicts of interest.

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2	मुझे असहनीय दर्द हुआ।	0	0	0	0	0	0	0	0	0	0	0
3	मुझे उल्टी हुई।	0	0	0	0	0	0	0	0	0	0	0
4	मुझे घबराहट हुई।	0	0	0	0	0	0	0	0	0	0	0
5	मुझे कंपकंपी हुई।	0	0	0	0	0	0	0	0	0	0	0
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6 7 8	मैं आराम महसूस कर रही हूं। मैं स्वतंत्र रूप से घूमने में सक्षम हूं। मैं बिना सहायता के अपने बचे को पकड़ सकती हूं।	<ul> <li>अस</li> <li></li></ul>	हमत 1 0	2 0 0	→ 3 0	→ 4 0 0	→ 5 0 0	- 6 0 0	- 7 0 0	- 8 0 0	9 0	छ       हमत       10       0       0       0
6 7 8 9	मैं आराम महसूस कर रही हूं। मैं स्वतंत्र रूप से घूमने में सक्षम हूं। मैं बिना सहायता के अपने बच्चे को पकड़ सकती हूं। मैं बिना किसी सहायता के अपने बच्चे को दूध पिला सकती हूं।	छ अस	हमत 1 0 0	2 0 0	→ 3 0 0	→ 4 0 0 0 0 0	<ul> <li>→</li> <li>5</li> <li>○</li> <li>○</li> <li>○</li> <li>○</li> <li>○</li> <li>○</li> <li>○</li> </ul>	→ 6 0 0 0 0	- 7 0 0	- 8 ○ ○	स 9 0 0	अ           हमत           10           0           0           0           0           0
6 7 8 9	मैं आराम महसूस कर रही हूं। मैं स्वतंत्र रूप से घूमने में सक्षम हूं। मैं बिना सहायता के अपने बच्चे को पकड़ सकती हूं। मैं बिना किसी सहायता के अपने बच्चे को दूध पिला सकती हूं। मैं अपने व्यक्तिगत स्वच्छता / शीचालप की देखभात कर सकती हूं।	अस           •	हमत 1 0 0	2 0 0 0		→ 4 0 0 0 0 0 0 0	→ 5 0 0 0 0 0 0	→ 6 0 0 0 0 0 0	- 7 7 0 0 0	- 8 0 0 0	₽ 0 0 0 0	अ       हमत       10       0       0       0       0       0       0       0       0       0       0

**Annexure 1:** Hindi version of the obstetric quality of recovery score-11 (ObsQoR-11H) questionnaire