

Supplementary Data

Setting

The PROCARDS study (NCT05684354) was conducted in a 1500-bed tertiary university hospital (University Hospital of Rennes, France), comprising a cardiothoracic surgery department with a 17-bed ICU.

Non-Inclusion criteria

Adults subject to legal protection (safeguard of justice, curatorship, guardianship), persons deprived of liberty, patients unable to complete the questionnaire independently (cognitive deficit or poor French comprehension) and non-elective surgery were not included.

Perioperative management

The perioperative management involved general anaesthesia with total intravenous anaesthesia using Propofol and Remifentanyl for all patients. Ketamine, Dexamethasone, and Lidocaine were administered during induction, and Lidocaine infusion was continued during the ICU stay for 24 hours. During the first 24 hours, morphine was administered through intravenous titration or orally, if possible, based on pain assessed by a Visual Analog Scale (VAS) score exceeding 3. Patients could undergo cardiopulmonary bypass (CPB) either under normothermia or mild hypothermia. In the postoperative period, all patients were transferred to the ICU before being transferred to the surgical ward.

QoR-15

The French version of the QoR-15¹ is a scale of 15 questions that quote physical and mental dimension of the recovery from 0 to 10. The scale is divided into two parts: part A consists of 10 questions for positive items and part B consists of 5 questions for negative items, with the numerical rating scale inverted². After summing all 15 responses, the QoR-15 is presented as a score, ranging from 0 to 150, with 150 corresponding to an ideal health status².

Data collection

Additional variables were collected including age, sex, body mass index (BMI), American Society of Anaesthesiologists (ASA) physical status score, preoperative status of diabetes, hypertension, smoking status. Following perioperative data were recorded: type of surgery, duration of CPB, need for cardiac pacing or dobutamine support at the end of surgery, number of pleural and mediastinal chest tubes and duration of surgical drainage, total dose of morphine used in ICU. Postoperative complications were recorded including cardiovascular complications³ (perioperative myocardial infarction requiring coronarography, ventricular tachycardia, ventricular fibrillation, cardiac arrest, atrial fibrillation requiring

antiarrhythmic medication or anticoagulation, pulmonary oedema requiring, depletion stroke with radiological diagnosis), pulmonary complications⁴ (pleural effusion drainage, pneumothorax drainage, radiological atelectasis, pneumonia as defined by the French society of anaesthesia and critical care⁵), sepsis as defined by Third International Consensus Definitions for Sepsis and Septic Shock [Sepsis-3]⁶, acute renal failure⁷, heparin-induced thrombocytopenia (HIT) documented by Serotonin release assay test and surgical revision. Length of stay (LOS) in ICU and hospital, and mortality at day 28 were also assessed.

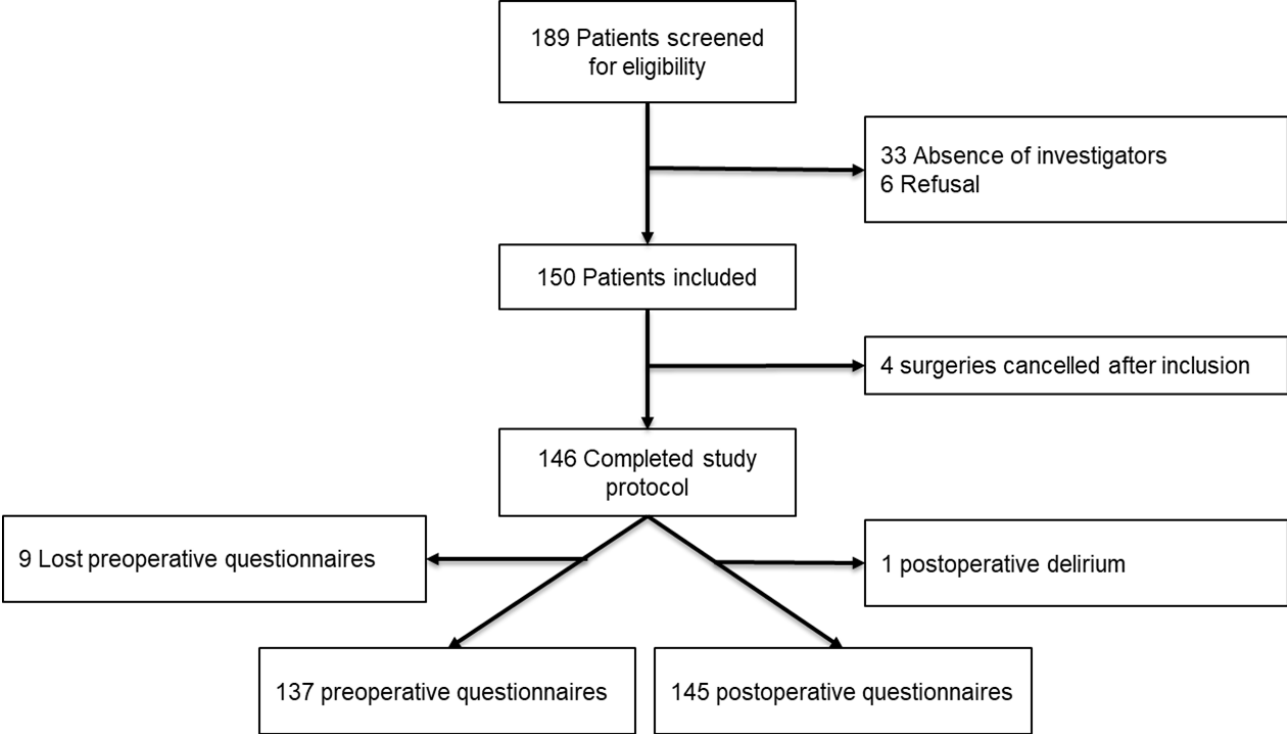
Statistical Analysis

Sample size was determined based on previously published studies^{1,2,8,9}. Accordingly, we aimed to include 150 patients. Data were reported as mean, standard deviation or number (percentage) as appropriate. Distribution was analysed with the Shapiro-Wilk test. Correlations were calculated using the Pearson correlation coefficient for Gaussian data or the Spearman correlation coefficient for non-Gaussian data. The null hypothesis was rejected if the two-tailed p-value was less than 0.05.

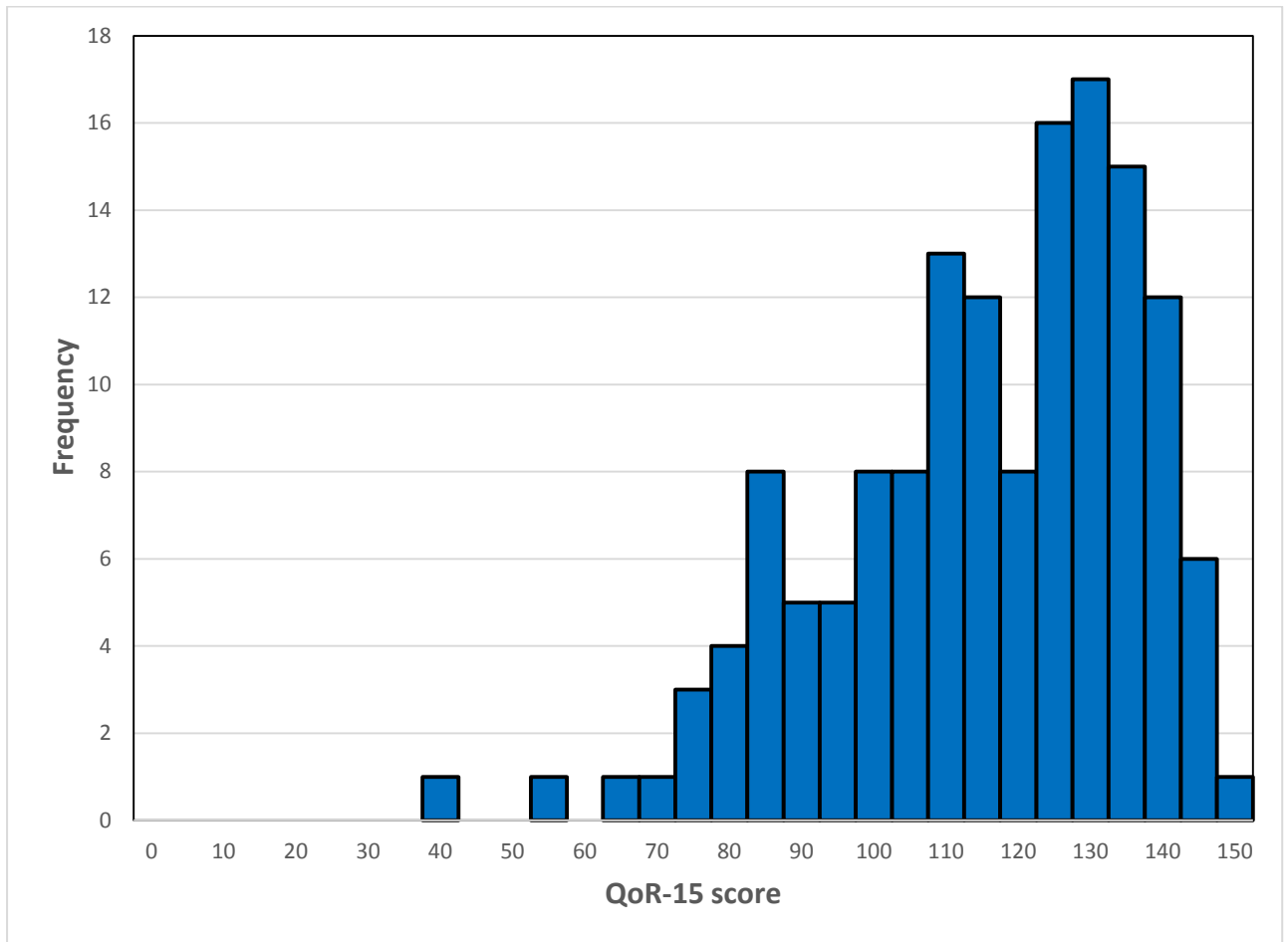
Based on recommended quality criteria for studies on the development and evaluation of health status questionnaires¹⁰, and similar to previous publications of the English² and the French version¹ of the QoR-15, convergent validity was tested by the hypothesis that there would be a positive correlation between the postoperative QoR-15 score and the global recovery assessment by the patient, or between the Δ QoR-15 (postoperative–preoperative QoR-15 scores) and the global recovery assessment. Convergent validity was also tested by the inter-item correlation. Construct validity was tested by the hypothesis that there would be a negative association between the QoR-15 score and various known determinants of postoperative recovery. We hypothesised that postoperative QoR-15 will be higher in the group of patient with global recovery assessment over than 70^{1,2}. Reliability was tested by internal consistency (Cronbach's alpha). Responsiveness was assessed by Cohen size effect and standardized response mean. Feasibility was evaluated by the successful completion rate. All analyses were performed by a statistician using SAS software, version 9.4.

References

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Supplementary Figure 1: Study flow chart.



Supplementary Figure 2: Distribution of the postoperative Quality of recovery 15 score (QoR-15).

Supplementary table 1: Mean preoperative, postoperative, change and responsiveness of the Quality of recovery 15 score (QoR-15).

QoR-15 Item	Preoperative QoR-15	Postoperative QoR-15	Mean change [95% CI]	% Change from Baseline	Cohen Effect Size	Standardised Response Mean
1. Able to breathe easily	8.5 ± 1.9	8.3 ± 1.8	-0.2 [-0.6 to -0.2]	3	0.13	0.09
2. Been able to enjoy food	9.4 ± 1.3	7.4 ± 2.7	-1.9 [-2.4 to -1.5]	21	0.82	0.71
3. Feeling rested	7.9 ± 2.1	6.4 ± 2.4	-1.4 [-1.9 to -0.9]	18	0.61	0.48
4. Have had a good sleep	7.6 ± 2.3	5.6 ± 2.7	-2.0 [-2.5 to -1.5]	26	0.74	0.61
5. Able to look after personal toilet and hygiene unaided	9.8 ± 0.8	8.8 ± 2.0	-0.9 [-1.3 to -0.6]	9	0.57	0.43
6. Able to communicate with family or friends	9.8 ± 0.5	9.4 ± 1.5	-0.4 [-0.6 to -0.1]	4	0.35	0.26
7. Getting support from hospital nurses and doctors	9.4 ± 1.5	9.4 ± 1.5	-0.0 [-0.4 to 0.4]	0	0.01	0.01
8. Able to return to work or usual home activities	8.4 ± 2.5	5.1 ± 3.1	-3.3 [-3.9 to -2.7]	39	0.10	0.91
9. Feeling comfortable and in control	8.2 ± 2.4	7.1 ± 2.5	-1.1 [-1.6 to 0.6]	13	0.44	0.38
10. Having a feeling of general well-being	8.0 ± 2.3	7.0 ± 2.5	-1.0 [-1.4 to -0.5]	12	0.40	0.34
11. Moderate pain	8.6 ± 2.2	7.8 ± 2.6	-0.8 [-1.3 to 0.2]	9	0.31	0.24
12. Severe pain	9.6 ± 1.5	9.2 ± 2.1	-0.4 [-0.8 to 0.0]	4	0.20	0.15
13. Nausea or vomiting	9.6 ± 1.6	9.2 ± 2.3	-0.3 [-0.8 to -0.1]	3	0.16	0.12
14. Feeling worried or anxious	6.8 ± 3.1	8.2 ± 2.6	1.5 [0.9 to 2.0]	22	-0.51	-0.45
15. Feeling sad or depressed	8.2 ± 2.7	8.5 ± 2.5	0.4 [0.1 to 0.9]	4	-0.14	-0.12
Total	130 ± 16	118 ± 21	-12 [-16 to -8]	9	0.61	0.52

Results are expressed as mean ± standard deviation or [95% confidence interval]

Supplementary table 2: Inter-item correlation matrix of the postoperative Quality of recovery 15 score (QoR-15).

QoR-15 Item Number	Total QoR-15 Score	Items														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.53	-	0.33*	0.43*	0.43*	0.22*	0.27*	0.31*	0.34*	0.34*	0.35*	0.25*	0.23*	0.27*	0.23*	0.21*
2	0.56		-	0.51*	0.36*	0.22*	0.28*	0.36*	0.25*	0.37*	0.43*	0.17*	0.26*	0.28*	0.19*	0.17*
3	0.73			-	0.58*	0.30*	0.30*	0.37*	0.45*	0.57*	0.62*	0.34*	0.28*	0.23*	0.38*	0.33*
4	0.62				-	0.24*	0.32*	0.33*	0.33*	0.41*	0.44*	0.31*	0.20*	0.23*	0.30*	0.32*
5	0.41					-	0.50*	0.46*	0.24*	0.39*	0.33*	0.21*	0.19*	0.26*	0.17*	0.19*
6	0.51						-	0.67*	0.18*	0.44*	0.40*	0.37*	0.33*	0.36*	0.33*	0.41*
7	0.54							-	0.13	0.46	0.42*	0.24*	0.41*	0.41*	0.34*	0.42*
8	0.65								-	0.60*	0.61*	0.36*	0.17*	0.14	0.20*	0.25*
9	0.81									-	0.88*	0.45*	0.27*	0.29*	0.45*	0.49*
10	0.83										-	0.46*	0.31*	0.30*	0.43*	0.47*
11	0.61											-	0.51*	0.32*	0.33*	0.28*
12	0.48												-	0.43*	0.26*	0.35*
13	0.48													-	0.36*	0.46*
14	0.57														-	0.68*
15	0.59															-

Results are expressed as Spearman coefficients, * p <0,05