

Table S1 Sensitivity analysis: multivariable logistic regression including postoperative CSHQ score

Characteristics	β	SE	Wald χ^2	P value	OR	95% CI
Age (years)	-0.118	0.251	0.223	0.637	0.89	0.54–1.46
BMI (kg/m ²)	0.072	0.101	0.511	0.475	1.08	0.88–1.31
Preoperative heart rate (bpm)	0.004	0.018	0.050	0.822	1.00	0.97–1.04
Preoperative MAP (mmHg)	-0.018	0.035	0.275	0.600	0.98	0.92–1.05
EtAC (%)	-0.285	1.500	0.036	0.849	0.75	0.04–14.1
VDD group	2.098	0.748	7.863	0.005*	8.15	1.88–35.3
CSHQ score	0.117	0.029	16.672	<0.001*	1.13	1.07–1.19

*, P<0.05. BMI, body mass index; CI, confidence interval; CSHQ, Children's Sleep Habits Questionnaire; EtAC, end-tidal sevoflurane concentration; MAP, mean arterial pressure; OR, odds ratio; SE, standard error; VDD, vitamin D deficiency.

Table S2 Interaction analysis of sleep quality and vitamin D status on CAPD-defined POD

Characteristics	β	SE	Wald χ^2	P value	OR	95% CI
Sleep quality $\times$ VDD	-0.038	0.087	0.194	0.659	0.963	0.81–1.14

CAPD, Cornell Assessment of Pediatric Delirium; CI, confidence interval; OR, odds ratio; POD, postoperative delirium; SE, standard error; VDD, vitamin D deficiency.

Table S3 Comparison of outcomes between VDD group and non-VDD group

Characteristics	VDD group (n=80)	Non-VDD group (n=240)	P value
Age (years)	4.25 $\pm$ 1.06	4.45 $\pm$ 1.12	0.173
Sex (male/female)	52/28	174/66	0.202
BMI (kg/m ²)	15.37 $\pm$ 1.93	15.39 $\pm$ 1.67	0.778
Preoperative heart rate (bpm)	96.25 $\pm$ 8.80	96.50 $\pm$ 10.60	0.877
Preoperative MAP (mmHg)	70.75 $\pm$ 5.77	69.20 $\pm$ 5.09	0.054
Surgery duration (min)	65.30 $\pm$ 27.26	62.04 $\pm$ 18.56	0.415
Length of hospital stay (days)	6.40 $\pm$ 2.30	6.50 $\pm$ 2.37	0.805
POD incidence	78 (97.5%)	179 (74.6)	<0.001*
CSHQ score	50.25 $\pm$ 11.07	41.78 $\pm$ 7.82	<0.001*

Data are presented as mean $\pm$ SD, number, or number (%). *, P<0.05. BMI, body mass index; CSHQ, Children's Sleep Habits Questionnaire; MAP, mean arterial pressure; POD, postoperative delirium; SD, standard deviation; VDD, vitamin D deficiency.