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Reasons and predictors of non-participation in a personalized digital prehabilitation care trial for patients undergoing elective cardiothoracic surgery

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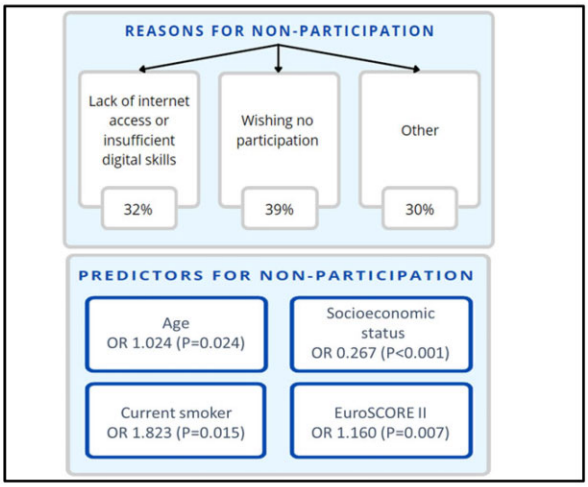
Summary

In a retrospective study of 815 patients who were scheduled for elective cardiothoracic surgery, the reasons and predictors of non-participation in a personalized digital prehabilitation care trial were evaluated. Non-participants were older and had more perioperative risk factors.



Legend: [OR: odds ratio]

Abstract

OBJECTIVES: Prehabilitation through a digital platform could preoperatively improve the physical and mental fitness of patients undergoing cardiothoracic surgery, thereby improving treatment outcomes. This study aimed to describe the reasons and predictors of non-participation in a personalized digital prehabilitation care trial (Digital Cardiac Counseling randomized controlled trial) for patients undergoing elective cardiothoracic surgery.

METHODS: Adult patients scheduled for elective cardiothoracic surgery at the Maastricht University Medical Center+ were approached to participate in a digital prehabilitation care trial, in which patients were informed about their care pathway, monitored for symptom progression and screened for preoperative modifiable risk factors. Baseline characteristics of all eligible patients and reasons of non-participation were registered prospectively. Predictors of non-participation were determined using logistic regression.

RESULTS: Between May 2020 and August 2022, 815 patients were eligible for participation; 421 (52%) did not participate in the personalized digital prehabilitation care trial. Reasons for non-participation were 'lack of internet access or insufficient digital skills' (32%), 'wishing no participation' (39%) and 'other reasons' (30%; e.g. vision or hearing impairments, analphabetism, language barriers). Independent predictors of non-participation were age [odds ratio (OR) 1.024 (1.003–1.046), $P = 0.024$], socioeconomic status [OR 0.267 (0.133–0.536), $P < 0.001$], current smoker [OR 1.823 (1.124–2.954), $P = 0.015$] and EuroSCORE II [OR 1.160 (1.042–1.292), $P = 0.007$].

CONCLUSIONS: Half of the eligible patients did not participate in a personalized digital prehabilitation care trial. Non-participants were vulnerable patients, with a more unfavourable risk profile and more modifiable risk factors, who could potentially benefit the most from prehabilitation.

Keywords: Preoperative care • Teleprehabilitation • Telemonitoring • Care pathway • Cardiothoracic surgery

ABBREVIATIONS

DCC	Digital Cardiac Counseling
DM	Diabetes mellitus
OR	Odds ratio
SES	Socioeconomic status

INTRODUCTION

Comorbidities and risk factors due to an unhealthy lifestyle have steadily increased over the last decades in patients undergoing cardiothoracic surgery [e.g. body mass index ≥35 kg/m^2 (7.7%), diabetes mellitus (DM, 38.7%), chronic obstructive pulmonary disease (8.5%)] leading to an elevated risk for perioperative complications [1]. Many of these comorbidities and risk factors are modifiable during the preoperative period by prehabilitation with medical (e.g. DM, anemia) or lifestyle interventions (e.g. physical exercise training, smoking cessation). A preoperative assessment can help to timely identify these modifiable risk factors and employ subsequent prophylactic interventions. Prehabilitation has shown the possibility to improve the physical and mental fitness of patients undergoing cardiothoracic surgery, thereby improving the tolerance for the procedure and reducing adverse outcomes [2–6]. During the coronavirus disease 19 pandemic, the potential of online, home-based teleprehabilitation programs has been shown in several studies [7, 8]. However, until now there is limited evidence of the feasibility, safety and effectiveness of teleprehabilitation programs within the field of cardiothoracic surgery.

The Digital Cardiac Counseling (DCC) randomized controlled trial was initiated during the coronavirus disease 19 pandemic [9] to test the feasibility, safety and effectiveness of teleprehabilitation programs for elective cardiothoracic surgery. In the DCC trial, elective patients were digitally informed about their care pathway, monitored for the progression of their symptoms and screened for modifiable risk factors. Half of the patients were randomized to a personalized multimodal teleprehabilitation program. The aim of the current study was to describe the reasons and predictors of non-participation in the personalized digital prehabilitation care trial.

PATIENTS AND METHODS

Study design

This study was designed as a retrospective analysis of prospectively collected data from a single centre, tertiary referral hospital, Maastricht University Medical Center+, in the Netherlands.

Ethical statement

The approval for the conduction of this study was provided in February 2022 by the Medical Ethical Committee azM/UM (METC 2022-3097).

Patients

The design, rational and inclusion and exclusion criteria of the DCC trial are explained in detail elsewhere [9]. Adult patients scheduled for elective cardiothoracic surgery at Maastricht University Medical Center+ were eligible for inclusion. Eligible patients were approached to participate in the digital prehabilitation care trial. Non-participants received standard care. Reasons for non-participation were registered prospectively as part of inclusion process of the DCC trial. Figure 1 show an overview of the study and standard care.

Personalized digital prehabilitation care trial

For the DCC trial, a customized digital environment was created. Participants received a login for their personal account. The platform was used to present audio-visual information related to their care pathway, to monitor patients throughout the preoperative period and to support personalized teleprehabilitation. After randomization, half of the participants in the digital care trial were offered a tailored teleprehabilitation program.

Outcome measurements

Data were registered prospectively between May 2020 and August 2022. All baseline characteristics were collected from the

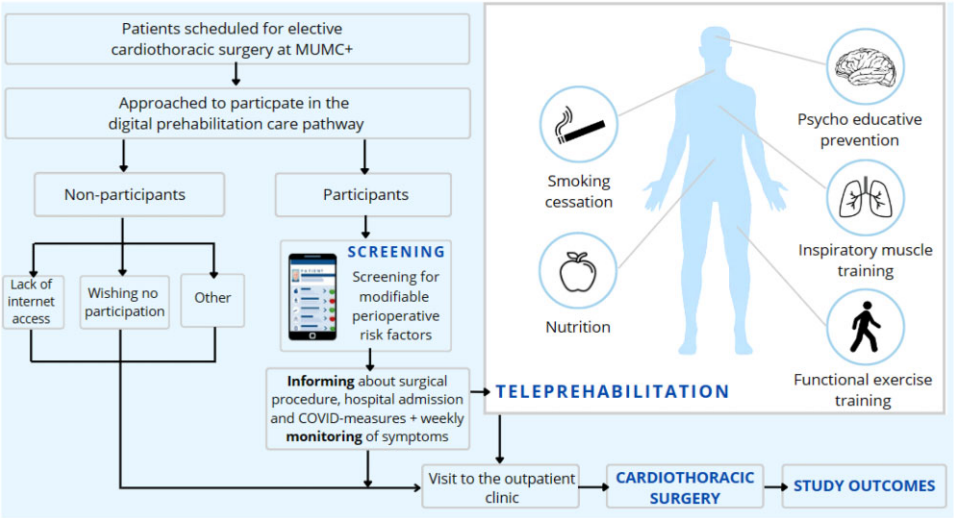


Figure 1: Overview of the Digital Cardiac Counseling randomized controlled trial and routine care.

hospital's electronic health records. Questionnaires on anxiety and depression (hospital anxiety and depression scale) [10], quality of life (EuroQol-5 dimension-5 l) [11] and nutritional status (short nutritional assessment questionnaire) [12] were part of the intake procedure at the outpatient clinic. Pulmonary risk scores were calculated according to Hulzebos *et al.* [13]. Socioeconomic status (SES) scores per neighbourhood were obtained via Statistics Netherlands. SES scores were measured based on household data regarding welfare, educational level and labour participation. Score range from -1 (lowest SES) to +1 (highest SES), where 0 is the average SES in the Netherlands [14].

Patient characteristics included age, sex, SES score, body mass index, chronic obstructive pulmonary disease, DM, smoking status, left ventricle ejection fraction, EuroSCORE II [15], pulmonary risk score, estimated glomerular filtration rate, primary pathology (i.e. coronary, valve, other), (non-)invasive surgery, hospital anxiety and depression scale score, New York Heart Association classification score [16], Canadian Cardiovascular Society classification score [17], short nutritional assessment questionnaire score, EuroQol-5 dimension-5 l index of utility score and metabolic equivalent of task score.

Statistical analysis

First, baseline characteristics were presented for the overall study population, non-participants and participants. Continuous variables were presented as mean (standard deviation) or median (interquartile range), based on data distribution. Categorical variables were presented as an absolute number (percentage) of the study population. Second, baseline characteristics of the 3 patient groups with different reasons of non-participation were presented. Statistical difference was analysed by means of Pearson chi-squared, Fisher's exact test, one-way analysis of variance or Kruskal–Wallis test, as appropriate. Third, to determine which baseline characteristics influenced non-participation in the personalized digital prehabilitation care trial, univariable and multivariable binary logistic regression was performed. Multicollinearity was tested by means of the variance inflation factor. Variables with a variance inflation factor of higher than 5 were excluded from the model. To account for missing data, multivariate imputation by chained equations was executed by using predictive mean matching [18]. A sensitivity analysis was carried out to examine the extent to which results were affected by imputing the missing data (no significant differences were found). R Statistical software version 4.2.0 (The R Foundation for Statistical Computing, Vienna, Austria) with the package multivariate imputation by chained equations was used to account for missing data. IBM SPSS Statistics for Windows version 25.0 (IBM Corp., Armonk, NY, USA) was used to perform other statistical analyses. Statistical tests were two-tailed and *P*-values $\leq$0.05 were considered statistically significant for all analyses.

RESULTS

Between May 2020 and August 2022, 869 patients were screened for eligibility in the digital care trial. A total of 54 patients were excluded because they did not meet the eligibility criteria (i.e. not waitlisted for elective surgery, participated in other randomized trial, unknown). As such, 815 patients were eligible for participation, of which 394 (48.3%) participated in the digital care trial and 421 did not (Fig. 2).

Baseline characteristics of all eligible patients, both non-participants and participants, are shown in Table 1. Overall, patients had a mean age of 67.4 years and were predominantly male (72.3%). In general, non-participants were older, had a lower SES, higher EuroSCORE II and more comorbidities, in comparison to the participants. Reasons for non-participation were collected during the inclusion process of the DCC trial and available for 409/421 non-participants. Lack of internet access or insufficient digital skills was the reason for non-participation in 129 patients (32%), wishing no participation in 158 patients (39%), and 122 patients (30%) had other reasons such as vision or hearing impairments, analphabetism or language barriers. Characteristics of these 3 groups are shown in Appendix A.

Independent predictors of non-participation in the digital care trial were age [odds ratio (OR) 1.024 (1.003–1.046), $P = 0.024$], SES [OR 0.267 (0.133–0.536), $P < 0.001$], current smoker [OR 1.823 (1.124–2.954), $P = 0.015$] and EuroSCORE II [OR 1.160 (1.042–1.292), $P = 0.007$]. The crude and adjusted model are shown in Table 2.

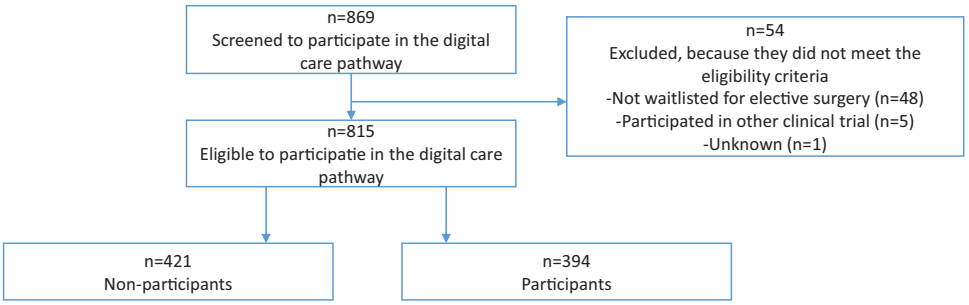


Figure 2: Flowchart of the current study.

Table 1: Baseline characteristics

Characteristic	Overall, *n* = 815	Non-participants, *n* = 421	Participants, *n* = 394
Age (years)	67.4 (10.1)	68.8 (10.6)	66.0 (9.2)
Male	589 (72.3%)	289 (68.6%)	300 (76.1%)
SES score	-0.066 (0.22)	-0.098 (0.22)	-0.031 (0.22)
BMI (kg/m^2)	27.5 (4.6)	27.5 (4.7)	27.6 (4.4)
COPD	78/804 (9.7%)	39/411 (9.5%)	39/393 (9.9%)
DM	146 (17.9%)	80 (19.0%)	66 (16.8%)
Smoking status			
Currently smoking	140/797 (17.6%)	87/405 (21.5%)	53/392 (13.5%)
Ex-smoker	324/797 (40.7%)	148/405 (36.5%)	176/392 (44.9%)
Never	333/797 (41.8%)	170/405 (42.0%)	163/392 (41.6%)
LVEF (%)	55 [53–55]	55 [50–55]	55 [55–57]
EuroSCORE II	1.35 [0.86–2.22]	1.52 [0.94–2.64]	1.18 [0.78–1.84]
Pulmonary risk score (≥2)	345/797 (43.3%)	194/404 (48%)	151/393 (38.4%)
eGFR (ml/min/1.73 m^2)	85 (30)	82 (30)	88 (29)
Primary pathology			
Coronary	305 (37.4%)	140 (33.3%)	165 (41.9%)
Valve	355 (43.6%)	205 (48.7%)	150 (38.1%)
Other	155 (19.0%)	76 (18.1%)	79 (20.1%)
Invasive surgery	422 (51.8%)	205 (48.7%)	217 (55.1%)
Elevated HADS score	171/561 (30.5%)	89/262 (34%)	82/299 (27.4%)
NYHA class			
1	298/764 (39.0%)	144/392 (36.7%)	154/372 (41.4%)
2	368/764 (48.2%)	189/392 (48.2%)	179/372 (48.1%)
3 or 4	98/764 (12.8%)	59/392 (15.1%)	39/372 (10.5%)
CCS class			
1	307/761 (40.3%)	147/391 (36.7%)	160/370 (43.2%)
2	354/761 (46.5%)	189/391 (47.6%)	168/370 (45.4%)
3 or 4	100/761 (13.1%)	58/391 (14.8%)	42/370 (11.4%)
Elevated SNAQ score (≥2)	79/555 (14.2%)	38/261 (14.6%)	41/294 (13/9%)
EQ-5D-5 l index of utility score	0.81 [0.66–0.89]	0.79 [0.62–0.88]	0.82 [0.67–0.89]
MET score			
<3	10/408 (2.5%)	7/210 (3.3%)	3/198 (1.5%)
3–6	136/408 (33.3%)	80/210 (38.1%)	56/198 (28.3%)
≥6	262/408 (64.2%)	123/210 (58.6%)	139/198 (70.2%)

Data are presented as *n* (%) or median (IQR).

BMI: body mass index; CCS: Canadian Cardiovascular Society; COPD: chronic obstructive pulmonary disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; EQ-5D-5 l: EuroQol-5 dimension-5 l; HADS: hospital anxiety and depression scale; IQR: interquartile range; LVEF: left ventricular ejection fraction; MET: metabolic equivalent of task; NYHA: New York Heart Association; SES: socioeconomic status; SNAQ: short nutritional assessment questionnaire.

DISCUSSION

The DCC trial was designed to inform patients about their care pathway, to monitor the progression of symptoms, screen for modifiable risk factors and provide personalized teleprehabilitation when indicated. In this observational cohort study of all patients screened for the DCC trial, half of the eligible patients did not participate in the personalized digital prehabilitation care trial. Non-participants were vulnerable patients, with a more unfavourable risk profile and more modifiable risk factors, who could potentially benefit the most from prehabilitation.

Of the eligible patients, 52% did not participate in the DCC trial. This is comparable to participation rates in regular cardiac rehabilitation [19], and similar to a Dutch telerehabilitation trial for patients with coronary artery disease [20]. One could have expected a higher participation rate in the preoperative care trial,

Table 2: Univariable and multivariable logistic regression models for non-participation in the digital care trial

Characteristics	Crude model			Adjusted model		
	B	OR (95% CI)	*P*-Value	*B*	OR (95% CI)	*P*-Value
Age (years)	0.028	1.028 (1.014–1.043)	<0.001*	0.024	1.024 (1.003–1.046)	0.024*
Male	-0.377	0.686 (0.503–0.935)	0.017*	-0.124	0.883 (0.615–1.268)	0.501
SES score	-1.436	0.238 (0.125–0.453)	<0.001*	-1.322	0.267 (0.133–0.536)	<0.001*
BMI (kg/m^2)	-0.006	0.994 (0.964–1.024)	0.675	-0.009	0.991 (0.951–1.033)	0.667
COPD	-0.073	0.929 (0.583–1.482)	0.758	-0.341	0.711 (0.411–1.229)	0.222
DM	0.154	1.166 (0.814–1.670)	0.403	0.243	1.275 (0.810–2.006)	0.294
Smoking status						
Currently smoking	0.436	1.547 (1.036–2.310)	0.033*	0.600	1.823 (1.124–2.954)	0.015*
Ex-smoker	-0.221	0.802 (0.592–1.085)	0.152	-0.185	0.831 (0.598–1.154)	0.269
Never	Reference			Reference		
LVEF (%)	-0.023	0.977 (0.959–0.996)	0.015*	-0.016	0.985 (0.964–1.005)	0.140
EuroSCORE II	0.212	1.236 (1.128–1.354)	<0.001*	0.149	1.160 (1.042–1.292)	0.007*
Pulmonary risk score (≥2)	0.347	1.415 (1.071–1.871)	0.015*	-0.069	0.933 (0.595–1.464)	0.764
eGFR (ml/min/1.73 m^2)	-0.007	0.993 (0.989–0.998)	0.004*	0.000	1.00 (0.993–1.007)	0.951
Primary pathology						
Coronary	-0.126	0.882 (0.599–1.299)	0.525	-0.026	0.975 (0.626–1.518)	0.909
Valve	0.351	1.421 (0.973–2.075)	0.069	0.221	1.247 (0.798–1.948)	0.332
Other	Reference			Reference		
Invasive surgery	-0.257	0.773 (0.587–1.019)	0.068	-0.182	0.834 (0.605–1.148)	0.266
Elevated HADS score	0.199	1.221 (0.903–1.650)	0.194	0.040	1.040 (0.714–1.517)	0.837
NYHA class						
1	Reference			Reference		
2	0.150	1.162 (0.865–1.561)	0.320	-0.307	0.736 (0.423–1.279)	0.277
3 or 4	0.517	1.677 (1.060–2.651)	0.027*	-0.220	0.803 (0.317–2.035)	0.644
CCS class						
1	Reference			Reference		
2	0.200	1.222 (0.910–1.641)	0.183	0.348	1.417 (0.834–2.408)	0.198
3 or 4	0.458	1.581 (1.010–2.476)	0.045*	0.216	1.241 (0.515–2.992)	0.630
Elevated SNAQ score (≥2)	0.276	1.318 (0.891–1.950)	0.166	0.178	1.195 (0.782–1.826)	0.411
EQ-5D-5 l index of utility score	-0.862	0.422 (0.232–0.771)	0.005*	-0.429	0.651 (0.290–1.460)	0.298
MET score						
<3	Reference			Reference		
3–6	0.075	1.078 (0.421–2.763)	0.875	-0.331	0.718 (0.257–2.008)	0.528
≥6	-0.439	0.644 (0.255–1.628)	0.353	-0.440	0.644 (0.237–1.751)	0.389

*A *P*-value of <0.05.

Data are presented as *n* (%) or median (IQR).

B: beta; BMI: body mass index; CCS: Canadian Cardiovascular Society; CI: confidence interval; COPD: chronic obstructive pulmonary disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; EQ-5D-5 l: EuroQol-5 dimension-5 l; HADS: hospital anxiety and depression scale; IQR: interquartile range; LVEF: left ventricular ejection fraction; MET: metabolic equivalent of task; NYHA: New York Heart Association; OR: odds ratio; SES: socioeconomic status; SNAQ: short nutritional assessment questionnaire.

as patients might be more motivated to make changes to their lifestyle prior to surgery [21–23]. Reasons for non-participating were 'lack of internet access or insufficient digital skills' (32%), 'wishing no participation' (39%) and 'other reasons' (30%), such as vision or hearing impairments, analphabetism or language barriers. Lack of internet access or insufficient digital skills was also found as the main reason for non-participation in a telerehabilitation trial [20]. It was found that patients with the lack of internet access or insufficient digital skills were older and had a more unfavourable risk profile (e.g. EuroSCORE II, estimated glomerular filtration rate and symptoms) compared to the other 2 groups.

Independent predictors of non-participation were older age, a lower socioeconomic status, current smoker and a higher EuroSCORE II. These results are confirmed by other studies in cardiac (tele)rehabilitation [20, 24, 25]. Non-participants of cardiac (p)rehabilitation are a vulnerable patient group with a more unfavourable risk profile and more modifiable risk factors who might benefit the most from these interventions. Especially a lower socioeconomic status was an important predictor of non-participation, which is supported by previous research [26, 27]. Lower socioeconomic status is related with a lack of (digital) health literacy [28], which might have caused the lower participation of these patients in the digital program.

The different reasons of non-participation and different characteristics of the non-participants stress the importance of different solutions to increase participation to prehabilitation programs in the future. Although supervised hospital-based programs might be the most effective, they are not accepted by many patients (e.g. long travel distance, time, concerns about safety) [8] and might not be cost effective for patients at low risk for perioperative complications. Therefore, hospitals should offer a broad range (e.g. supervised hospital-based, home-based with telemonitoring and unsupervised community) of prehabilitation programs that are tailored to the characteristics (e.g. preferences, digital literacy, distance to the hospital) and risk profile of the patient. Interventions to support patients with a lower digital health

literacy [29] might facilitate participation in future teleprehabilitation programs.

FUTURE RESEARCH

First, it must be established whether non-participation is associated with an increased risk for adverse events in the perioperative period. Then, various interventions must be employed to increase participation of these vulnerable patients that are currently underrepresented in prehabilitation programs to see whether their perioperative outcomes can be improved by preoperative optimization.

CONCLUSION

Half of the eligible patients scheduled for elective cardiothoracic surgery did not participate in the personalized digital prehabilitation care trial. Reasons for non-participation were 'lack of internet access or insufficient digital skills', 'wishing no participation' and 'other reasons'. Independent predictors of non-participation were older age, lower socioeconomic status, current smoker and higher EuroSCORE II. Hence, non-participants were vulnerable patients, with a more unfavourable risk profile and more modifiable risk factors, who could potentially benefit the most from prehabilitation. To facilitate the participation of these patients, hospitals should offer a broad range of prehabilitation programs that are tailored to the characteristics, risk profiles and preferences of the patients.

Conflict of interest: none declared.

DATA AVAILABILITY

All relevant data are within the manuscript and its Supporting Information files.

Author contributions

Bart Scheenstra: Conceptualization; Data curation; Methodology; Writing—original draft; Writing—review & editing. **Bart C. Bongers:** Writing—review & editing. **Britney Broeders:** Data curation; Visualization. **Maike Imkamp:** Formal analysis. **Lieke Van Susante:** Data curation. **Bas Kietselaer:** Writing—review & editing. **Jos Maessen:** Supervision. **Arnoud van 'T Hof:** Supervision. **Peyman Sardari Nia:** Conceptualization; Supervision; Writing—review & editing.

Reviewer information

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APPENDIX A

Table A1: Characteristics for the 3 different groups of non-participants

Characteristic	Non-participants (*n* = 409)	Lack of internet access or insufficient digital skills (*n* = 129)	Wishing no participation (*n* = 158)	Other (*n* = 122)	*P*-Value
Age (years)	68.87 (10.7)	73.3 (7.5)	68.5 (10.6)	64.3 (11.7)	<0.001*
Male	279 (68.2%)	83 (64.3%)	104 (65.8%)	92 (75.4%)	0.124
SES score	-0.096 (0.221)	-0.090 (0.226)	-0.106 (0.215)	-0.089 (0.223)	0.768
BMI (kg/m^2)	27.45 (4.69)	27.88 (4.56)	27.19 (4.49)	27.33 (5.06)	0.441
COPD	38/400 (9.5%)	12/126 (9.5%)	17/156 (10.9%)	9/118 (7.6%)	0.655
DM	78 (19.1%)	27 (20.9%)	24 (15.2%)	27 (22.1%)	0.272
Smoking status					0.884
Currently smoking	86/394 (21.8%)	31/125 (24.8%)	31/155 (20.0%)	24/114 (21.1%)	
Ex-smoker	146/394 (37.1%)	43/125 (34.4%)	59/155 (38.1%)	44/114 (38.6%)	
Never	162/394 (41.1%)	51/125 (40.8%)	65/155 (41.9%)	46/114 (40.4%)	
LVEF (%)	55 [53–55]	55 [50–55]	55 [50–55]	55 [50–55]	0.141
EuroSCORE II	1.35 [0.86–2.22]	1.67 [1.17–2.66]	1.56 [0.93–2.67]	1.38 [0.81–2.45]	0.042*
Pulmonary risk score (≥2)	187/393 (47.6%)	74/125 (59.2%)	66/155 (42.6%)	47/113 (41.6%)	0.007*
eGFR (ml/min/1.73 m^2)	81.93 (30.55)	74.36 (26.13)	82.87 (30.49)	88.79 (33.34)	<0.001*
Primary pathology					0.227
Coronary	134 (32.8%)	37 (28.7%)	50 (31.6%)	47 (38.5%)	
Valve	201 (49.1%)	72 (55.8%)	79 (50.0%)	50 (41.0%)	
Other	74 (18.1%)	20 (15.5%)	29 (18.4%)	25 (20.5%)	
Invasive surgery	197 (48.2%)	62 (48.1%)	68 (43.0%)	67 (54.9%)	0.144
Elevated HADS score	89/258 (34.5%)	27/83 (32.5%)	35/108 (32.4%)	27/67 (40.3%)	0.521
NYHA class					0.029*
1	141/382 (36.9%)	36/120 (30.0%)	49/148 (33.1%)	56/114 (49.1%)	
2	183/382 (47.9%)	63/120 (52.5%)	75/148 (50.7%)	45/114 (39.5%)	
3 or 4	58/382 (15.2%)	21/120 (17.5%)	24/148 (16.2%)	13/114 (11.4%)	
CCS class					0.099
1	144/381 (37.8%)	38/120 (31.7%)	53/147 (36.1%)	53/114 (46.5%)	
2	180/381 (47.2%)	58/120 (48.3%)	73/147 (49.7%)	49/114 (43.0%)	
3 or 4	57/381 (15.0%)	24/120 (20.0%)	21/147 (14.3%)	12/114 (10.5%)	
Elevated SNAQ score (≥2)	38/257 (14.8%)	8/83 (9.6%)	19/107 (17.8%)	11/67 (16.4%)	0.265
EQ-5D-5 l index of utility score	0.81 [0.66–0.89]	0.78 [0.61–0.85]	0.79 [0.62–0.88]	0.82 [0.65–0.88]	0.183
MET score					0.406
<3	7/206 (3.4%)	2/60 (3.3%)	2/85 (2.4%)	3/61 (4.9%)	
3-6	77/206 (37.4%)	28/60 (46.7%)	29/85 (34.1%)	20/61 (32.8%)	
≥6	122/206 (59.2%)	30/60 50.0%)	54/85 (63.5%)	38/61 (62.3%)	

Data are presented as *n* (%) or median (IQR).

*A *P*-value of <0.05.

BMI: body mass index; CCS: Canadian Cardiovascular Society; COPD: chronic obstructive pulmonary disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; EQ-5D-5 l: EuroQol-5 dimension-5 l; HADS: hospital anxiety and depression scale; LVEF: left ventricular ejection fraction; MET: metabolic equivalent of task; NYHA: New York Heart Association; SES: socioeconomic status; SNAQ: short nutritional assessment questionnaire.