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Impact of Cardiovascular Rehabilitation on Functional Capacity Following Cardiac Surgery: A Cohort Study at Yaoundé General Hospital, Cameroon

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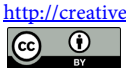
Abstract

Background: Cardiovascular rehabilitation (CR) is associated with improvements in functional capacity post-cardiac surgery, but its impact in low-resource settings like Cameroon remains understudied. This study evaluated the pre-post associations of CR with functional capacity in patients following cardiac surgery. **Methods:** A single-group cohort study with retrospective and prospective data collection was conducted at the Cardiovascular and Metabolic Rehabilitation Unit (CMRU) of Yaoundé General Hospital (YGH) from February 2024 to June 2025. It included adults who completed ≥ 10 CR sessions post-cardiac surgery. Retrospective data (February-November 2024) were extracted from medical records, while prospective data (December 2024-June 2025) were collected at the start and end of CR. Functional capacity and haemodynamic outcomes were assessed at CR completion; complications were monitored during a separate 4-week follow-up period after CR completion. Sociodemographic, clinical, and therapeutic profiles were described. Functional capacity parameters *i.e.* maximal oxygen consumption (VO_2max),



six-minute walk test (6MWT), Duke Activity Status Index (DASI), metabolic equivalents [METs] were compared pre- and post-CR using paired t-tests and McNemar's tests. Determinants of changes in functional capacity were identified using linear regression ($p < 0.05$). **Results:** Participation in CR was associated with significant pre-post improvements in objective VO_2max from 17.5 ± 8.2 to 30.0 ± 9.1 mL/kg/min (+12.5 mL/kg/min, +71.4%, $p < 0.001$), 6MWT distance from 448 ± 88 to 565 ± 92 m (+117 m, +26.1%, $p < 0.001$), METs from 5.0 ± 2.3 to 8.6 ± 2.6 (+3.6, +72%, $p < 0.001$), and DASI score from 18.6 to 52.9 (+34.3 points, +184.4%, $p < 0.001$). Resting heart rate (–9 bpm, $p < 0.001$), blood pressure, and dyspnoea improved, with all patients achieving NYHA stage I post-CR ($p < 0.001$). Non-modifiable cardiovascular risk factors, particularly a family history of hypertension, were associated with reduced VO_2max improvement ($\beta = -8.28$, $p < 0.001$). Higher baseline resting heart rate was linked to greater 6MWT gains ($\beta = 2.77$, $p = 0.023$). **Conclusion:** Participation in CR was associated with significant improvements in functional capacity in patients' post-cardiac surgery in a low-resource setting like Cameroon. Improving CR accessibility and tailoring programmes for patients with non-modifiable risk factors could optimise outcomes.

Keywords

Cardiovascular Rehabilitation, Cardiac Surgery, Functional Capacity, Cameroon

1. Introduction

Cardiovascular diseases (CVDs) account for 19.8 million deaths annually, representing 33% of global mortality [1]. Their burden is particularly pronounced in sub-Saharan Africa (SSA), where healthcare systems struggle to meet rising demand [2]. In 2021, of the 18 million premature deaths from non-communicable diseases (before age 70), approximately 38% were CVD-related [1]. Despite the increasing prevalence of CVDs in SSA, specialized facilities remain scarce, with an average of one cardiac surgery unit per 33 million inhabitants [3]. Although the Shisong Cardiac Centre (SCC), inaugurated on 20 November 2009, remains Cameroon's only fully operational specialised institution [4], cardiac surgery was introduced in 1985 at Yaoundé University Teaching Hospital (CHUY) [5]. Since then, several programmes have emerged through North-South collaborations, with one of the most recent launched at Yaoundé General Hospital (YGH) in September 2022 [5].

Post-cardiac surgery, cardiovascular rehabilitation (CR) is recommended to reduce morbidity and enhance quality of life. While feasible care models exist in African contexts, many SSA patients lack access [6]-[8]. In high-income countries, CR increases VO_2max by over 20% [9] improves six minute walking test (6MWT) distance [10] [11], enhances physical function, and reduces mortality, readmissions, anxiety, and depression [12]. In Cameroon, access to these benefits is lim-

ited by financial constraints, a lack of specialised centres, and insufficient trained personnel, despite adapted care models.

YGH, a pioneer in Cameroon's public sector, addressed this challenge by establishing its Cardiovascular and Metabolic Rehabilitation Unit (CMRU) in February 2024, an innovative initiative to provide post-surgical care in a low-resource setting, offering hope for patients seeking to resume an active life. This study aims to address critical knowledge gaps regarding CR in SSA, particularly in Central Africa. Our objectives are threefold: (1) to describe the sociodemographic, clinical, and therapeutic profiles of patients' post-cardiac surgery; (2) to compare their functional capacity before and after CR; and (3) to identify factors associated with functional capacity post-CR. By exploring these questions, we seek to demonstrate CR's feasibility and impact in a resource-constrained setting, where most patients rely on family support to fund care. Our findings could inform universal health coverage policies, essential for reducing access inequalities and achieving the Sustainable Development Goals to reduce CVD-related mortality by 2030 [13]. By highlighting CR's potential benefits in Cameroon, this study aims to inspire similar initiatives across SSA, transforming patients' lives and strengthening healthcare systems.

2. Methodology

2.1. Study Design

This study combined a retrospective and prospective cohort approach (single-group design) to assess the pre-post associations between cardiovascular rehabilitation (CR) and functional capacity in patients, post-cardiac surgery at Yaoundé General Hospital (YGH).

2.2. Study Setting and Study Period

The research was conducted at the Cardiovascular and Metabolic Rehabilitation Unit (CMRU) of YGH, located in Yaoundé, Cameroon. The CMRU, is equipped with cycle ergometers, a treadmill, a muscle-strengthening apparatus, an electrocardiogram (ECG) system, and echocardiographic equipment. Staffed by two cardiologists, one general practitioner, and one nurse, the unit manages approximately 10 patients per month.

Data from patients who completed CR between February and November 2024 were collected retrospectively. Data from patients who completed CR between December 2024 and June 2025 were collected prospectively. Participants were monitored for up to 4 weeks post-CR to evaluate outcomes and complications. Functional capacity parameters and haemodynamic measures were assessed immediately before CR initiation and at completion of the CR programme. Participants were monitored for up to 4 weeks after CR completion to evaluate complications.

2.3. Participants

Eligible participants were adults (aged ≥18 years) who had undergone cardiac sur-

gery (e.g., valve replacement, coronary artery bypass grafting) and completed at least 10 CR sessions at the CMRU. Patients with contraindications to CR, such as unstable angina or severe arrhythmias, or those lost to follow-up due to death or withdrawal were excluded. A non-probabilistic consecutive sampling method was used to include all qualifying patients.

2.4. Data Collection

Data were gathered retrospectively from CMRU registries and patient charts, followed by prospective assessments at the initiation and completion of cardiac rehabilitation using a standardized protocol. Initially, a structured questionnaire captured sociodemographic details (age, sex, place of residence, occupation, education level, marital status, and insurance coverage) along with clinical background (cardiovascular risk factors, heart failure etiology, and prior treatments). Vital signs were then recorded: blood pressure and heart rate (seated, following 5 minutes of rest) with an OMRON HEM-432C sphygmomanometer, oxygen saturation by pulse oximetry, body weight on a 150-kg analog scale, and height via stadiometer. Functional capacity was evaluated next: the 6-minute walk test (6MWT) conducted on a 20-m course with VO_2max estimated as distance × 0.1 + 3.5 mL/kg/min, and the Duke Activity Status Index (DASI) questionnaire with VO_2max calculated as 0.43 × DASI + 9.6. The sequence concluded with a modified Bruce protocol exercise stress test, echocardiography (LVEF determined by Simpson's method), and 12-lead ECG, all performed by trained personnel using calibrated equipment. All primary outcomes (functional capacity, haemodynamics, NYHA classification) were collected at CR completion.

2.5. Variables

The main variables of interest included 6MWT distance (m), DASI score, METs (metabolic equivalents), and VO_2max (mL/kg/min, calculated as [6MWT distance × 0.023 + 4.948] ± 1.1). Other variables of interest were sociodemographic data (age, sex, educational attainment, occupation, place of residence, and source of financial support); clinical data (cardiovascular risk factors such as smoking, obesity, and family history; surgical indications; post-operative medications; and complications); resting/maximal heart rate (HR, bpm), systolic/diastolic blood pressure (SBP/DBP, mmHg), dyspnoea (assessed via NYHA classification and Borg scale), fatigue, exercise power (Watts, WHO 25 protocol), maximal effort stage (modified Bruce protocol), and segmental muscle strength. The predictors or modifiers of interest included age, sex, cardiovascular risk factors, number of CR sessions, and baseline HR. The confounders were type of surgery, time from surgery to CR initiation, and cardiovascular risk factors.

2.6. Cardiovascular Rehabilitation Procedure

The CR programme consisted of 10 - 30 sessions over 5 - 10 weeks, with 2 - 3 sessions weekly, each lasting 50 - 70 minutes. The protocol included:

1) Warm-up Phase (5 - 15 min): Gentle stretching and slow-paced walking.

2) Exercise Phase (40 - 50 min): Aerobic activities (treadmill or cycle ergometer, targeting a maximum HR of 120 bpm) combined with light resistance training.

3) Cool-down Phase (5 - 10 min): Low-intensity walking and relaxation exercises.

Sessions were overseen by a cardiologist or nurse, with adjustments made based on patient tolerance (assessed via the Borg scale) and haemodynamic monitoring. Educational sessions on cardiovascular health were integrated. ECG monitoring ensured safety by identifying contraindications.

2.7. Statistical Analysis

Continuous variables (e.g., VO_2max, 6MWT distance) were reported as means ± standard deviations and analysed using paired t-tests to compare pre- and post-CR values. Categorical variables (e.g., dyspnoea, fatigue) were evaluated with McNemar's test.

Linear regression models identified determinants of changes in VO_2max and 6MWT distance, adjusting for confounders. To identify determinants of changes in functional capacity, univariable linear regression was first performed for each potential predictor (age, sex, non-modifiable risk factors, family history of hypertension, baseline resting HR, number of CR sessions, and time from surgery to CR initiation). Variables with $p < 0.10$ or clinically important were then entered into multivariable linear regression models adjusting for confounders (age, sex, type of surgery, and time from surgery to CR initiation). Missing data were not imputed, and patients with incomplete data were excluded from relevant analyses.

2.8. Ethical Considerations

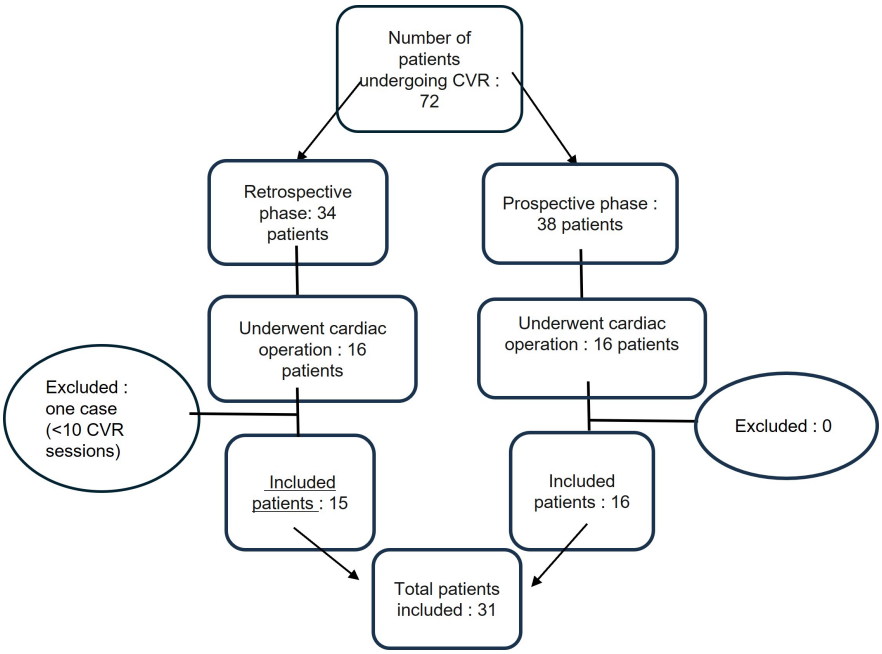
Ethical clearance was obtained from the University of Douala Ethics Committee (Ref: 4795/CEI-UDo/03/2025) and YGH (Ref: 0298-25/HGY/DG/DPM/APM-AS). Informed consent was secured for prospective participants, while a waiver was granted for retrospective data due to their anonymized nature. Data were coded, stored securely, and used exclusively for research purposes, adhering to ethical guidelines.

3. Results

3.1. Participant Characteristics

Of 72 patients enrolled in CR at the CMRU from February 2024 to June 2025, 32 were post-cardiac surgery. One was excluded for completing < 10 sessions, leaving 31 patients (15 retrospective, 16 prospective), as shown in **Figure 1**. The mean age was 48 ± 15 years (range 22 - 76), with 64.5% female (M/F ratio: 0.55). Most had secondary (48.4%) or tertiary (45.1%) education, worked in the informal sector (38.7%), and resided in Yaoundé (80.6%). Family financial support was received by 71%, and none had health insurance, as reported in **Table 1**. Complete pre- and post-CR data were available for all 31 patients for VO_2max, 6MWT distance,

METs, DASI score, haemodynamic measures, NYHA classification, and most clinical outcomes. Post-CR LVEF was available for only 15 patients due to logistical constraints on repeat echocardiography. Exercise stress test parameters were available for 29 patients (two patients experienced ventricular tachycardia during initial testing).



Note: CVR = Cardiovascular Rehabilitation.

Figure 1. Recruitment flowchart.

Table 1. Sociodemographic, clinical, and surgical characteristics.

Characteristics	Frequency (N = 31)	%
Age (years)		
<50	17	54.9
≥50	14	45.1
Gender		
Female	20	64.5
Male	11	35.5
Education Level		
Primary	2	6.5
Secondary	15	48.4
Tertiary	14	45.1
Financial Support		
Family	22	71.0
Personal	9	29.0
Health Insurance	0	0.0

Continued

Cardiovascular Risk Factors (Non-Modifiable, n = 23, 74.2%)		
Family history of hypertension	16	51.6
Family history of stroke/sudden death	3	9.7
Cardiovascular Risk Factors (Modifiable, n = 10, 32.3%)		
Alcohol consumption	7	22.6
Obesity	6	19.4
Smoking	3	9.7
Hypertension	3	9.7
Sedentary lifestyle	3	9.7
Diabetes	1	3.2
Type of Cardiac Surgery		
Mitral valve replacement	11	35.5
Aortic valve replacement	8	25.8
Coronary artery bypass grafting	5	16.1
Mitral annuloplasty	4	12.9
Myxoma ablation	3	9.7
Tricuspid valve replacement	1	3.2
Tricuspid annuloplasty	1	3.2
Pericardiectomy	1	3.2
Ventricular septal defect repair	1	3.2
Aneurysm repair	1	3.2
Dyspnoea stage		
Stage I	5	16.1
Stage II	16	51.6
Stage III	10	32.3
Stage IV	0	-
Post-Operative Treatments		
Diuretics	30	96.8
Beta-blockers	28	90.3
Anticoagulants	23	74.2

VSD = Ventricular Septal Defect

3.2. Clinical and Therapeutic Profile

Dyspnoea was present in 26 patients (83.9%), with 51.6% at NYHA stage II and 32.3% at stage III. Non-modifiable cardiovascular risk factors were present in 74.2%, primarily a family history of hypertension (51.6%) and age ≥50 years

(45.2%). Modifiable risk factors included alcohol consumption (22.6%) and obesity (19.4%). Valvular diseases (64.5%) and coronary artery disease (16.1%) were the main surgical indications. Mitral (35.5%) and aortic (25.8%) valve replacements predominated, with 95% using prostheses (78.9% mechanical). Post-operative treatments included diuretics (96.8%), beta-blockers (90.3%), and anticoagulants (74.2%), as reported in Table 1.

3.3. CR Programme

Patients completed a mean of 14 ± 5 CR sessions (range 10 - 30) over 5 - 10 weeks, with 77.5% attending three sessions weekly. Time from surgery to CR initiation: mean 59 ± 160 weeks; median 12 weeks (IQR 6-28).

3.4. Functional Capacity Outcomes

Table 2. Haemodynamic, clinical, and functional changes.

Variable	Pre-CR	Post-CR	Δ (%)	p-value
Resting HR (bpm)	78 ± 13	69 ± 9	−11.5%	<0.001
Resting SBP (mmHg)	124 ± 14	118 ± 15	−4.8%	0.010
Resting DBP (mmHg)	75 ± 6	71 ± 8	−5.3%	0.034
VO_2max (mL/kg/min)	17.5 ± 8.2	30.0 ± 9.1	+71.4%	<0.001
6MWT (m)	448 ± 88	565 ± 92	+26.1%	<0.001
DASI Score	18.6 ± 12.5	52.9 ± 14.8	+184.4%	<0.001
METs	5.0 ± 2.3	8.6 ± 2.6	+72%	<0.001
Power (Watts)	28 ± 12	45.8 ± 14	+63.6%	<0.001
Effort Stage	3.03 ± 0.91	4.52 ± 0.72	+49.2%	<0.001
Effort Duration (min)	11.7 ± 2.8	16.3 ± 2.3	+39.3%	<0.001
Muscle Load (kg)	15.6 ± 6.2	19.3 ± 6.9	+23.7%	<0.001
Repetitions	85 ± 53	152 ± 89	+78.8%	<0.001
Fatigue	28 (83.9%)	0 (0%)	−83.9%	<0.001
Dyspnoea NYHA II-III	26 (83.9%)	0 (0%)	−83.9%	<0.001
LVEF (%)*	52.4 ± 11.2	58.7 ± 7.9	+6.3%	0.008
ECG Abnormalities	14 (45.2%)	3 (9.7%)	−35.5%	0.002

Note: SBP = Systolic Blood Pressure; DBP Diastolic Blood Pressure; HR = Heart Rate; bpm = beats per minute; 6MWT = 6-Minute Walk Test; METs = Metabolic Equivalents. Bold p-values indicate statistical significance. *n = 31 for all variables unless otherwise specified. *Post-CR LVEF was available for only 15 patients due to logistical constraints on repeat echocardiography in the retrospective/prospective cohort. Paired LVEF comparison is restricted to these 15 patients.

VO_2max increased from 17.5 ± 8.2 to 30.0 ± 9.1 mL/kg/min (+71.4%, $p < 0.001$). 6MWT distance rose from 448 ± 88 to 565 ± 92 m (+26.1%, $p < 0.001$). METs improved from 5.0 ± 2.3 to 8.6 ± 2.6 (+72%, $p < 0.001$). DASI score increased from

18.6 to 52.9 (+34.3 points, +184.4%, $p < 0.001$). Exercise test power increased from 28 ± 12 to 45.8 ± 14 Watts (+63.6%, $p < 0.001$). Maximal effort stage (modified Bruce protocol) rose from 3.03 ± 0.91 to 4.52 ± 0.72 (+49.2%, $p < 0.001$), and effort duration from 11.7 ± 2.8 to 16.3 ± 2.3 min (+39.3%, $p < 0.001$), as reported in Table 2.

3.5. Haemodynamic and Clinical Outcomes

Resting HR decreased from 78 ± 13 to 69 ± 9 bpm (−11.5%, $p < 0.001$). Resting SBP fell from 124 ± 14 to 118 ± 15 mmHg (−4.8%, $p = 0.010$), and DBP from 75 ± 6 to 71 ± 8 mmHg (−5.3%, $p = 0.034$). Muscle strength improved, with upper limb load increasing from 15.6 ± 6.2 to 19.3 ± 6.9 kg (+23.7%, $p < 0.001$) and repetitions from 85 ± 53 to 152 ± 89 (+78.8%, $p < 0.001$). Fatigue resolved in all 28 affected patients (83.9% initially, $p < 0.001$). Dyspnoea improved from 83.9% (51.6% NYHA stage II, 32.3% stage III) to 100% NYHA stage I ($p < 0.001$). ECG abnormalities (e.g., ventricular extrasystoles) decreased from 45.2% to 9.7% ($p = 0.002$). LVEF (assessed by Simpson's method) was available pre-CR for all 31 patients (mean 52.4 ± 11.2%, with 67.8% ≥ 50%) and post-CR for 15 patients (mean 58.7 ± 7.9%, with 100% ≥ 50%). In the subset of 15 patients with paired pre- and post-CR measurements, LVEF increased by +6.3% ($p = 0.008$, paired t-test), reflecting improved ventricular function following CR, as reported in Table 2.

3.6. Determinants of Functional Capacity Changes

In the multivariable linear regression models (adjusted for age, sex, type of surgery, and time from surgery to CR initiation), non-modifiable cardiovascular risk factors ($\beta = -8.28$, $p < 0.001$), particularly a family history of hypertension ($\beta = -4.14$, $p = 0.049$), reduced VO_2max improvement. Male sex showed a non-significant trend ($\beta = -4.07$, $p = 0.063$). Higher baseline resting HR was associated with greater 6MWT improvement ($\beta = 2.77$, $p = 0.023$). More CR sessions showed a non-significant positive trend ($\beta = 5.83$, $p = 0.085$), while non-modifiable risk factors had a negative trend ($\beta = -85.42$, $p = 0.060$), as reported in Table 3.

Table 3. Determinants of changes in VO_2max and 6MWT distance.

Parameters	VO_2max		6MWT Distance	
	β ± SE	p-value	β ± SE	p-value
Age (years)	−0.06 ± 0.05	0.292	−0.19 ± 1.13	0.868
Male Sex	−4.07 ± 2.15	0.063	−56.25 ± 35.72	0.122
Non-Modifiable Risk Factors	−8.28 ± 2.01	<0.001	−85.42 ± 44.12	0.060
Family History of Hypertension	−4.14 ± 2.07	0.049	−21.59 ± 34.98	0.544
Baseline Resting HR (bpm)	0.13 ± 0.08	0.110	2.77 ± 1.19	0.023
Number of CR Sessions	0.20 ± 0.23	0.398	5.83 ± 3.34	0.085

3.7. Complications and Follow-Up

Two patients experienced ventricular tachycardia during initial exercise tests, delaying testing. No deaths occurred during CR. Within 4 weeks post-CR, two non-cardiac deaths (infections) and one readmission for fatigue/dyspnoea were recorded.

4. Discussion

This cohort study, conducted at YGH's CMRU from February 2024 to June 2025, evaluated the pre-post associations of cardiovascular rehabilitation (CR) with functional capacity in 31 adults post-cardiac surgery. Marked physiological gains were observed following participation in CR. VO_2max rose by 71.4% (+12.5 mL/kg/min, $p < 0.001$), driven by enhanced stroke volume, widened arteriovenous oxygen difference, and skeletal muscle mitochondrial adaptations from aerobic training [14]. 6MWT distance increased by 26.1% (+117 m, $p < 0.001$), reflecting improved peripheral oxygen extraction, delayed anaerobic threshold, and better ventilatory efficiency [14]. METs surged by 72% ($p < 0.001$) via cumulative cardiorespiratory conditioning [14], while DASI score improved by 184.4% ($p < 0.001$), capturing subjective functional gains from severe baseline limitation (NYHA II-III in 83.9%). Resting heart rate fell by 11.5% ($p < 0.001$) through heightened parasympathetic tone [15]; systolic (−4.8%, $p = 0.010$) and diastolic blood pressure (−5.3%, $p = 0.034$) declined via reduced vascular stiffness and sodium overload [15]; dyspnoea resolved fully (100% NYHA I, $p < 0.001$) due to decreased pulmonary congestion and diaphragmatic strengthening [14].

These findings align with international literature. The pre-post changes exceed high-income benchmarks [9] and align with North African observations (+41.6%, 6.38 mL/kg/min) [16]. The 6MWT improvement (+26.1%) is comparable to gains in Wicks *et al.* (+21.8%) [10] and Pollmann *et al.* (+13%), [17] in developed countries but lower than Gaye *et al.* (+54.2%) in Senegal [18]. The DASI score improvement (+184.4%) was more pronounced than in McKeever *et al.* (+82.9%) in Switzerland [19] or Bhattal *et al.* (+9.9%) in the USA [20], possibly due to more severe baseline cases (NYHA II-III, 83.9%) in our cohort, which may allow greater improvement potential.

These pre-post changes also exceed high-income benchmarks (VO_2max +20% [9]; 6MWT +13-21.8% [10] [16]) and North African gains (+41.6% [15]), likely from greater improvement potential in severe cases. Separately, family history of hypertension blunted VO_2max gains ($\beta = -8.28$, $p < 0.001$) by constraining autonomic plasticity [21], while higher baseline resting HR predicted larger 6MWT advances ($\beta = 2.77$, $p = 0.023$), signalling greater remodelling reserve.

The observed improvements are consistent with the combined effect of aerobic and muscle-strengthening exercises, optimising cardiorespiratory efficiency [14]. Reductions in resting heart rate and blood pressure reflect improved autonomic regulation and reduced hydrosodic overload [15]. Non-modifiable risk factors, such as a family history of hypertension, may limit autonomic responses to train-

ing, as shown in a cohort of young athletes in Portugal [21]. Given that valvular diseases were the most common surgical indication at YGH [5], the high proportion of females (64.5%) and mean age of 48 years, which is relatively young (48 years) may reflect the epidemiology of rheumatic valvular disease in Cameroon [22].

This is one of the first studies in Central Africa to address this gap in the literature. The retro-prospective design ensures a robust sample, and standardised tests (6MWT, modified Bruce protocol) enhance methodological strength. However, the small sample size (n = 31) limits generalisability, and the lack of a control group complicates causal attribution. High CR costs and lack of insurance affected adherence, despite family support for 71% of patients. These results highlight CR's observed benefits in a low-resource setting, but financial barriers persist. Integrating CR into universal health coverage and developing additional units in Cameroon are essential. Tailored programmes for patients with non-modifiable risk factors and enhanced therapeutic education could optimise post-hospitalisation outcomes.

5. Conclusions

This cohort study shows that participation in CR was associated with substantial improvements in functional capacity and haemodynamic parameters in patients' post-cardiac surgery in Cameroon, despite a resource-constrained setting. These observational findings, consistent with international literature, underscore the importance of improving CR accessibility, through universal health coverage policies and adapted infrastructure. By addressing access gaps and personalising programmes, Cameroon could reduce cardiovascular morbidity and inspire similar initiatives across SSA, contributing to the Sustainable Development Goals by 2030.

What Is Known about This Topic:

1) Cardiovascular diseases account for 33% of global mortality, with a significant burden in SSA, where specialised facilities are scarce (one cardiac surgery unit per 33 million inhabitants).

2) CR post-cardiac surgery is associated with improvements in functional capacity, reduces mortality, and enhances quality of life in high-income countries, but access in SSA is limited by financial constraints and lack of infrastructure.

3) In Cameroon, cardiac surgery patients, often with rheumatic valvular diseases, face barriers to CR due to high costs and lack of insurance.

What This Study Adds:

1) CR at YGH was associated with significant improvements in VO_2max (+71.4%), 6MWT distance (+26.1%), METs (+72%), DASI score (+184.4%), and haemodynamic parameters, demonstrating feasibility in a low-resource setting.

2) Non-modifiable risk factors, such as a family history of hypertension, limit VO_2max improvement, while higher baseline resting heart rate enhances 6MWT progress, highlighting the need for tailored programmes.

3) These findings advocate for integrating CR into universal health coverage in Cameroon, with a need for expanded infrastructure and improved financial access to reduce inequalities.

Data Availability

Data supporting the study's findings are available from the corresponding author (SD) upon reasonable request.

Ethical Approval

The study was approved by the Ethics Committee of the University of Douala (Ref: 4795/CEI-UDo/03/2025) and YGH (Ref: 0298-25/HGY/DG/DPM/APM-AS). The requirement for informed consent was waived for the retrospective phase due to the use of anonymised secondary data. All procedures complied with applicable guidelines and regulations.

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Conflicts of Interest

The authors declare no conflicts of interest.

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