

AN EVALUATION OF 12-MONTHS IN PHASE IV CARDIAC REHABILITATION

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Introduction

Exercise-based cardiac rehabilitation (CR) is a fundamental part of recovery from heart-related issues and also an important secondary prevention strategy for risk factor management.

Study Aims

To evaluate key health & fitness parameters of cardiac patients participating in a Phase IV CR circuit class over a 12-month period (2018 – 2019).

Methods

Recruitment

25 cardiac patients referred to a community Phase IV CR circuit class (males = 16; females = 9; mean age 74.1 ± 5.9 years) were evaluated for key health and functional capacity parameters over a 12-month period (2018 & 2019).

Measurements

Anthropometric: body mass index (BMI) & waist circumference (WC); **health:** resting systolic (SBP), diastolic blood pressure (DBP) & resting heart rate (RHR); and **functional capacity measurement:** 6-minute shuttle walking distance (6MWD).

Phase IV CR Exercise Intervention (1 x week)

Warm Up (15 minutes)

Graded cardiovascular (CV) warm-up, consisting of various multi-directional mobility movements, co-ordination & dynamic stretching exercises.

CV Conditioning Component (40 minutes)

Circuit format of alternating CV & muscular strength endurance (MSE) exercises (using resistance bands or light hand weights), e.g. shuttle walking, standing press-ups, sit to stand, step-ups, chest press, etc. The circuit was continuous & lasted for 40 minutes, consisting of 1 minute exercise stations (40 exercise stations). Exercise intensity monitored through a combination of pulse monitoring and RPE (midpoint & end of circuit). Participants encouraged to exercise at an RPE of 11-15 dependent on ability.

CV Cool Down, Stretching & Balance (10 minutes + 10 minutes)

Easy 10 minute walking cool down with stationary activities for those less mobile, followed by functional mobility & static stretching exercises to promote muscle lengthening & avoid adaptive shortening, especially around the chest & shoulders. Static & dynamic balance exercise challenges also incorporated.

Results (mean \pm SD)

BMI, WC, SBP, DBP & RHR did not significantly change. BMI was reported in an overweight classification (26.41 ± 2.98 kg/m²). 40% of participants had a WC that exceeded recommended levels for substantially increased health risk (females ≥ 88 cm; males ≥ 102 cm). SBP and DBP both decreased and remained in a normotensive range. However, 6MWD significantly increased from 492.16 ± 79.97 m to 509.20 ± 90.85 m ($p=0.037$).

Table 1. Health & Functional Data for Phase IV Participants in

Measurement	2018 mean \pm SD	2019 mean \pm SD	Difference	Paired Sample T-test P value
BMI (kg/m ²)	26.20 \pm 2.99	26.41 \pm 2.98	+ 0.21	0.394
WC (cm)	92.79 \pm 9.94	93.96 \pm 10.79	+ 1.17	0.088
SBP (mmHg)	135.64 \pm 16.91	131.68 \pm 17.43	- 3.96	0.276
DBP (mmHg)	75.80 \pm 10.02	73.20 \pm 10.95	- 2.60	0.209
RHR (bpm)	63.32 \pm 9.20	63.92 \pm 8.05	+ 0.60	0.688
6MWD (m)	492.16 \pm 79.97	509.20 \pm 90.85	+ 17.04	0.037*
6MWT Terminal HR (bpm)	93.17 \pm 24.54	89.96 \pm 14.41	- 3.21	0.569

Key:

6MWT = 6-minute walk test

HR = heart rate

* $p < 0.05$

Discussion

Phase IV exercise training seems to offer the opportunity for participants in their mid-70s to improve functional capacity as measured by distance achieved in 6MWT & at a lower physiological cost (reduced 6MWT Terminal HR in 2019), even though they were 1-year older. It also helps to maintain a healthy BP, although other risk factors related to obesity metrics need further attention.

Conclusion

A once a week circuit-based exercise training session did improve functional capacity of Phase IV participants, indicating increased fitness. However, it did not positively impact on anthropometric parameters (BMI, WC). Additional interventions are needed at Phase IV to effectively manage all risk factors to preserve health.

Limitations

Due to resource limitations it was not possible to track individual physical activity or attendance data. 6MWT did not provide a peak value, although participants were instructed to walk as far as possible in 6-minutes.

Further Research Recommendations

Supervised CR exercise can help patients regain & sustain their health, independence & quality of life. It also provides an effective secondary prevention strategy, helping to reduce future costs & burden to carers & the healthcare system. Continued engagement with Phase IV exercise provides an opportunity for further improvement in health & functional status as part of CVD risk management. This work provides a compelling case for longitudinal studies tracking CVD patients to ensure behaviours & education messages promoted early in the CR journey are reinforced & patients receive regular evaluation on key metrics for CVD reduction.

Key References

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