



## Introduction

In the 100 days following a revascularization procedure for coronary artery disease (CAD), approximately 27.4% of patients will experience an adverse cardiac event. Post-revascularization health status is thought to be determined by several behaviors, including physical activity. However, most patients have difficulty achieving the levels of physical activity recommended by the World Health Organization, despite interventions aimed to support regular physical activity. Indeed, physical inactivity doubles the risk of experiencing other adverse cardiac event.

Several biopsychosocial factors, such as depression, cardiac anxiety, anxiety sensitivity, fear of exercise, diabetes, and obesity have been associated with physical inactivity in patients with CAD. Thus, it would be relevant to assess a broader range of biopsychosocial factors associated with physical inactivity following revascularization for CAD in order to identify which of these are determinants of the association with physical inactivity.

The objective of this study is to identify the biopsychosocial determinants of physical inactivity six months after a revascularization procedure for CAD.

## Methods

### Participants

This study involved patients (n=395) aged 18 years or older who underwent a revascularization procedure in the context of CAD at the Quebec Heart and Lung Institute (IUCPQ) in Quebec City, Canada. Patients with severe communication problems, terminal illness, major cognitive impairment, and/or other conditions that could affect their ability to participate in the study were excluded.

### Measures

- Sociodemographic questionnaires : sex, age, education level, annual income, working and living status
- Medical interview : body mass index, smoking status, cardiac events, diabetes, arthritis or osteoarthritis, gastroesophageal reflux disease, dyslipidemia, referral to cardiovascular rehabilitation program, referral to mental health services
- Pittsburgh Sleep Quality Index (PSQI; higher score = worse sleep quality)
- Hospital Anxiety and Depression Scale (HADS; higher score = higher symptom severity)
- Cardiac Anxiety Questionnaire (CAQ; higher score = higher cardiac anxiety)
- MOS Social Support Survey (MOSSS; higher score = higher social support)
- International Physical Activity Questionnaire (IPAQ; 0 = inactive, 1 = active)

### Procedure

Eligible patients were identified during their hospitalization at the IUCPQ. A research assistant approached them to inform them of the research project and to obtain their consent. Three months after the revascularization procedure, participants completed a phone interview and questionnaires on the REDCap platform. Physical inactivity was reassessed six months after the procedure. A logistic regression analysis was performed using the variables assessed at the three-month follow-up as independent variables and physical inactivity at the six-month follow-up as the dependent variable.

## Discussion

Three factors assessed at the three-month follow-up are significantly and independently associated with physical inactivity, six months post-procedure:

- Physical inactivity
- Sleep quality
- Referral to a cardiovascular rehabilitation program

Physical inactivity at three months was associated with physical inactivity six months post-revascularization, which illustrates the challenge of adopting an active lifestyle in generally inactive individuals. Poor sleep quality is associated with decreased interest and participation in physical activity, which would explain the physical inactivity in individuals at the follow-up. Furthermore, the effectiveness of cardiovascular rehabilitation programs in increasing physical activity is well established. Thus, referral to such programs decreases the risk of physical inactivity six months post-revascularization.

### Limitations

- Lack of measurement of participants' adherence to the cardiovascular rehabilitation program
- No assessment of the causal relationship between physical inactivity and sleep quality
- Underrepresentation of women with CAD in the sample

Table 1. Biopsychosocial factors associated with physical inactivity six months post-revascularization for CAD (n= 395)

Variables	Frequencies	Odds Ratio (univariate model)	Confidence intervals (95%)	p	Odds Ratio (multivariate model)	Confidence intervals (95%)	p
Women	n= 64 (18.1 %)	1.01	0.59-1.75	0.98			
Age	$\bar{X}$ = 66.5 (SD = 9.3)	1.01	0.99-1.03	0.49			
Post-secondary degree	n= 201 (56.8 %)	0.89	0.58-1.35	0.58			
Annual income > \$60 000	n= 182 (51.4 %)	0.79	0.52-1.20	0.27			
Workers	n= 103 (29.1 %)	0.77	0.48-1.22	0.23			
Living with someone	n= 271 (76.6 %)	1.02	0.62-1.66	0.95			
Body mass index	$\bar{X}$ = 28 (SD = 5.2)	1.02	0.98-1.06	0.44			
Smokers	n=28 (7.9 %)	1.12	0.52-2.50	0.77			
At least 1 cardiac event in the last 3 months	n= 21 (5.9 %)	0.75	0.30-1.81	0.51			
New diagnostic of diabetes	n= 14 (4.0 %)	3.18	0.97-14.25	0.08			
New diagnostic of arthritis or osteoarthritis	n= 25 (7.1 %)	1.53	0.67-3.70	0.33			
New diagnostic of acid reflux	n= 17 (4.8 %)	1.20	0.45-3.38	0.72			
New diagnostic of dyslipidemia	n= 216 (61.0 %)	1.63	1.06-2.52	0.03			
Referral to a cardiac rehabilitation programme	n= 108 (30.5 %)	0.59	0.37-0.93	0.02	0.55	0.33-0.90	0.02
Referral to mental health services	n= 8 (2.3 %)	1.40	0.34-6.91	0.65			
PSQI	$\bar{X}$ = 5.5 (SD = 3.4)	1.09	1.03-1.17	<0.01	1.09	1.02-1.17	0.02
HADS - Anxiety subscale	$\bar{X}$ = 4.5 (SD = 3.2)	1.02	1.01-1.06	0.59			
HADS - Depression subscale	$\bar{X}$ = 3.1 (SD = 3.1)	1.10	1.02-1.18	0.01			
CAQ	$\bar{X}$ = 17.5 (SD = 9.3)	1.03	1.01-1.06	<0.01			
MOSSS	$\bar{X}$ = 16.4 (SD = 3.6)	0.99	0.94-1.06	0.93			
Physically inactive at 3 months follow-up	n = 173 (48.9 %)	5.07	3.24-8.07	<0.01	5.08	3.21-8.15	<0.01

## Conclusions

Preliminary results indicate that referral to a cardiovascular rehabilitation program appears to promote physical activity in the population studied. Additional interventions may be needed to promote physical activity, and thereby decrease the risk of adverse cardiac events, in patients with poor sleep quality or who are physically inactive three months after the revascularization procedure.

