



Assessment of Physical Activity Using Waist-Worn Accelerometers in Hospitalized Heart Failure Patients and Its Relationship with Kansas City Cardiomyopathy Questionnaire

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Table of Contents

Figure S1. A summary of the Kansas City Cardiomyopathy Questionnaire scores

Table S1. Patient backgrounds in patients undergoing right heart catheterization

Table S2. Subgroup analysis on correlation of accelerometer-measured physical activity with the Kansas City Cardiomyopathy Questionnaire for patients receiving right heart catheterization

Table S3. Subgroup analysis on correlation of physical activity assessed by cardiopulmonary exercise testing with the Kansas City Cardiomyopathy Questionnaire and accelerometer-measured parameters for patients receiving right heart catheterization

Figure S1. A summary of the Kansas City Cardiomyopathy Questionnaire scores.

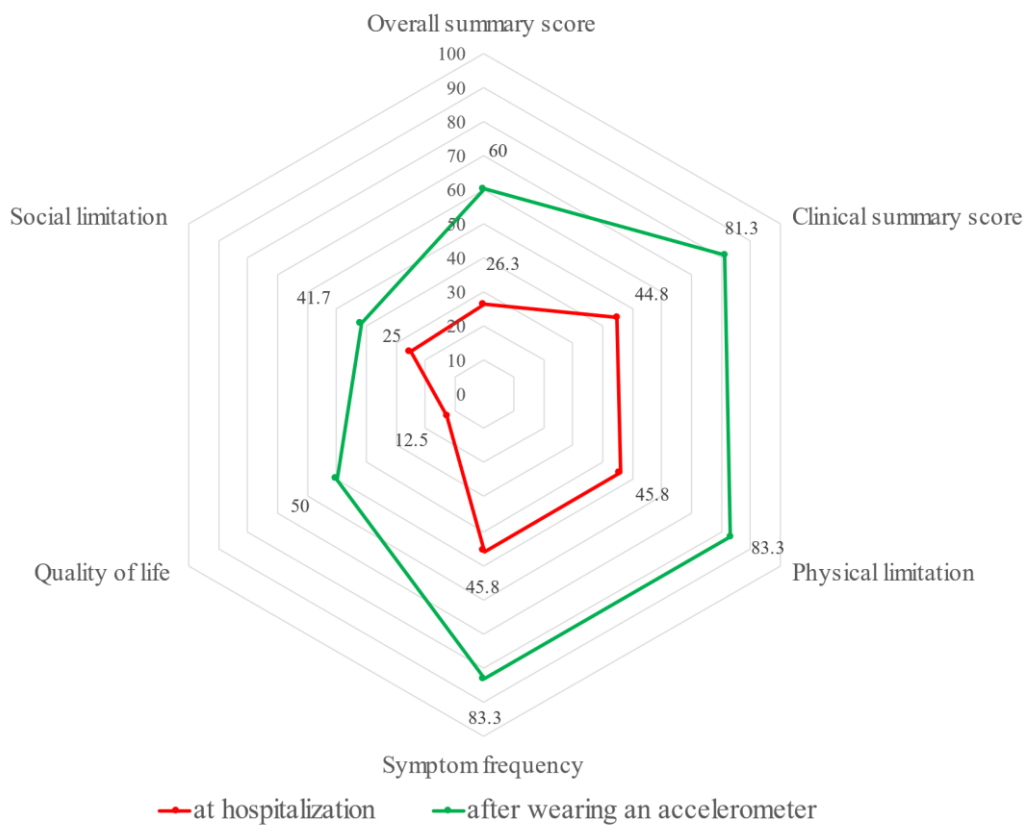


Table S1. Patient backgrounds in patients undergoing right heart catheterization.

Value	Patients with RHC n = 14
Age, years	69 (55–79)
Men, n (%)	9 (64)
Body mass index, kg/m ²	21.0 (20.4–25.5)
Systolic blood pressure, mm Hg	98 (91–107)
Heart rate, bpm	70 (59–74)
LVEF, %	27 (25–34)
LVDd, mm	58 (56–69)
LVDs, mm	51 (44–60)
NYHA class, n (%)	
II	10 (71)
III	4 (29)
Clinical frailty scale, n (%)	
2 (fit)	6 (43)
3 (managing well)	5 (36)
4 (very mild frailty)	3 (21)
5 (mild frailty)	0 (0)
Triggers of acute decompensation	
Nonadherence to diet, n (%)	0 (0)
Nonadherence to medication, n (%)	1 (7)
Overwork, n (%)	2 (14)
Arrhythmia, n (%)	1 (7)
Ischemia, n (%)	1 (7)
Infection, n (%)	2 (14)
Others or none, n (%)	7 (50)
Past medical history	
Patients with ≥1 HF hospitalization in previous 1 year, n (%)	5 (36)
Coronary artery disease, n (%)	3 (21)
Atrial fibrillation, n (%)	3 (21)
Hypertension, n (%)	6 (43)
Diabetes mellitus, n (%)	1 (7)
Stroke, n (%)	5 (36)
COPD, n (%)	2 (14)
Laboratory test	
Hemoglobin, g/dL	12.0 (11.1–13.8)
Creatinine, mg/L	1.0 (0.9–1.4)
Blood urea nitrogen, mg/L	23.5 (16.3–32.8)
Sodium, mEq/L	139.1 (137.7–140.3)
Potassium, mEq/L	4.4 (4.1–4.5)
Total bilirubin, mg/L	0.9 (0.7–1.2)
Albumin, mg/L	4.0 (3.5–4.0)
BNP at hospitalization, pg/mL	916 (256–1896)
BNP at discharge, pg/mL	342 (178–432)
BNP improvement during hospitalization, % *	58.4 (47.2–85.2)
HF treatment	
Loop diuretics, n (%)	11 (79)
ACEi or ARB, n (%)	13 (93)

ARNi, n (%)	0 (0)
Beta blocker, n (%)	13 (93)
MRA, n (%)	9 (64)
SGLT2i, n (%)	3 (21)
ICD, n (%)	2 (14)
CRT, n (%)	1 (7)
CPX parameter [#]	
Peak VO₂, ml/kg/min	11.3 (9.7–15.7)
AT VO₂, ml/kg/min	9.3 (8.6–11.5)
VE vs. VCO₂ slope	37.1 (30.6–47.9)
Accelerometer-measured parameter	
Daily step counts, n/day	2539 (1263–4252)
Exercise time	2.2 (1.1–3.5)
%sedentary time, %	71.9 (63.7–82.0)

* BNP improvement was defined as (BNP at admission – BNP at discharge) / BNP at admission.

Abbreviations: LVEF, left ventricular ejection fraction; LVDd, left ventricular end-diastolic diameter; LVDs, left ventricular end-systolic diameter; NYHA, New York Heart Association; HF, heart failure; COPD, chronic obstructive pulmonary disease; BNP, B-type natriuretic peptide; ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor antagonist; ARNI, angiotensin receptor neprilysin inhibitor; MRA, mineralocorticoid receptor antagonist; SGLT2i, sodium glucose cotransporter-2 inhibitor; ICD, implantable cardioverter defibrillator; CRT, cardiac resynchronization therapy; CPX, cardiopulmonary exercise testing; VO₂, oxygen consumption; AT, anaerobic threshold; VE, expiratory minute volume; VCO₂, carbon dioxide production;.

Table S2. Subgroup analysis on correlation of accelerometer-measured physical activity with the Kansas City Cardiomyopathy Questionnaire for patients receiving right heart catheterization.

Value	Accelerometer-measured parameters		
	Daily step count	Exercise time	%sedentary time
KCCQ-OSS	$r = 0.43, P = 0.125$	$r = 0.56, P = 0.037$	$r = -0.63, P = 0.017$
KCCQ-CSS	$r = 0.58, P = 0.029$	$r = 0.61, P = 0.022$	$r = -0.77, P = 0.001$
Each domain of KCCQ-12			
Physical limitation	$r = 0.56, P = 0.037$	$r = 0.52, P = 0.056$	$r = -0.66, P = 0.011$
Symptom frequency	$r = 0.52, P = 0.057$	$r = 0.60, P = 0.024$	$r = -0.77, P = 0.001$
Quality of life	$r = -0.03, P = 0.931$	$r = 0.28, P = 0.337$	$r = -0.44, P = 0.118$
Social limitation	$r = 0.21, P = 0.482$	$r = 0.32, P = 0.258$	$r = -0.13, P = 0.658$

r represents Pearson's correlation coefficient. %sedentary time is defined as sedentary time / device-equipped time.

Abbreviations: KCCQ, Kansas City Cardiomyopathy Questionnaire; OSS, overall summary score; CSS, clinical summary score.

Table S3. Subgroup analysis on correlation of physical activity assessed by cardiopulmonary exercise testing with the Kansas City Cardiomyopathy Questionnaire and accelerometer-measured parameters for patients receiving right heart catheterization.

Value	Cardiopulmonary exercise testing parameters		
	Peak VO ₂	AT VO ₂	VE vs. VCO ₂ slope
KCCQ-OSS	r = 0.51, P = 0.094	r = 0.38, P = 0.227	r = -0.21, P = 0.519
KCCQ-CSS	r = 0.54, P = 0.072	r = 0.48, P = 0.117	r = -0.29, P = 0.369
Each domain of KCCQ-12			
Physical limitation	r = 0.59, P = 0.046	r = 0.56, P = 0.057	r = -0.31, P = 0.328
Symptom frequency	r = 0.44, P = 0.158	r = 0.34, P = 0.275	r = -0.23, P = 0.466
Quality of life	r = 0.56, P = 0.061	r = 0.35, P = 0.260	r = -0.03, P = 0.920
Social limitation	r = 0.12, P = 0.704	r = 0.01, P = 0.996	r = -0.06, P = 0.843
Accelerometer-measured parameters			
Daily step count	r = 0.15, P = 0.651	r = 0.25, P = 0.425	r = -0.27, P = 0.394
Exercise time	r = 0.13, P = 0.682	r = -0.16, P = 0.616	r = -0.23, P = 0.476
%sedentary time	r = -0.74, P = 0.006	r = -0.63, P = 0.028	r = 0.39, P = 0.211

r represents Pearson's correlation coefficient. %sedentary time is defined as sedentary time / device-equipped time.

Abbreviations: KCCQ, Kansas City Cardiomyopathy Questionnaire; OSS, overall summary score; CSS, clinical summary score; VO₂, oxygen consumption; AT, anaerobic threshold; VE, expiratory minute volume; VCO₂, carbon dioxide production.