

The influence of multidisciplinary rehabilitation on physical well-being and quality of life of breast cancer survivors: a RCT

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INTRODUCTION

Breast cancer treatment may cause negative side effects. The aim of this study was to examine the effects of a multidisciplinary oncologic rehabilitation program on health related quality of life (HRQoL), cancer related fatigue (CRF), physical fitness and anthropometrics in breast cancer survivors.

RESULTS

- o Flow chart
- o Table 1: both groups are homogeneous at baseline, expect for physical fitness, waist circumference, fatigue and global health status.
- o Table 2: there is a(n) (significant) improvement in physical fitness over time in both groups, with a bigger effect in the intervention group.
- o Table 3: except for fat percentage in the intervention group, there was no significant change in body composition in both groups over time.
- o Table 4a, 4b and 4c: improvements in CRF, QOL and QOL symptoms are measured in both groups over time.

	Intervention group (n=122)	Control group (n=45)
Civil status		
Living together	13 (11.1%)	7 (16.3%)
Unmarried	7 (6.0%)	3 (7.0%)
Married	70 (59.0%)	28 (65.1%)
Divorced	23 (19.7%)	4 (9.3%)
widow	4 (3.4%)	1 (2.3%)
Affected side		
left	55 (46.0%)	21 (48.0%)
right	59 (50.0%)	19 (44.2%)
bilateral	4 (3.4%)	3 (7.0%)
Tumor classification		
stadium 0	2 (2.1%)	4 (9.0%)
stadium I	25 (20.8%)	13 (31.7%)
stadium Iia	27 (28.7%)	12 (29.3%)
stadium Iib	19 (20.2%)	6 (14.0%)
stadium Iiia	21 (22.3%)	6 (14.0%)
Surgery		
breast conserving surgery	65 (55.1%)	26 (61.9%)
total mastectomy	53 (44.9 %)	19 (38.1%)
Treatment		
chemotherapy	88 (76.1%)	26 (68.4%)
radiotherapy	104 (92.0%)	41 (97.6%)
hormone therapy	82 (78.1%)	35 (89.7%)
immunotherapy	18 (15.0%)	5 (11.1%)
Menopausal status		
pre-menopausal	58 (53.2%)	17 (40.0%)
post-menopausal	51 (46.8%)	29 (66.4%)
Age (years)	50.40 (\pm 11.63)	52.53 (\pm 14.11)
Physical fitness:		
VO ₂ max (ml/min)**	1399.87 (\pm 299.39)	1514.24 (\pm 355.66)
VO ₂ max (ml/kg/min)**	20.10 (\pm 5.12)	22.48 (\pm 5.07)
6 MW [†]	527.9 (\pm 81.06)	554.48 (\pm 78.65)
Body composition		
body weight	72.61 (\pm 17.41)	68.66 (\pm 13.03)
BMI	26.90 (\pm 6.13)	25.27 (\pm 4.76)
fat %	37.86 (\pm 9.88)	34.06 (\pm 8.35)
whole body impedance	632.79 (\pm 108.45)	657.54 (\pm 83.92)
waist circumference*	85.65 (\pm 14.67)	81.78 (\pm 10.70)
hip circumference	111.48 (\pm 75.95)	100.97 (\pm 68.87)
WHR	0.81 (\pm 0.10)	0.81 (\pm 0.064)
CRF		
Facit-F**	27.65 (\pm 9.75)	35.07 (\pm 10.18)
EORTC QLQ-C30 subscale fatigue**	49.99 (\pm 23.38)	37.21 (\pm 25.99)
QOL		
EORTC QLQ-C30 global health**	54.41 (\pm 15.79)	64.15 (\pm 18.58)

Abbreviations: BMI, Body Mass Index; WHR, waist hip ratio; CRF, cancer-related fatigue.

[†]trend to significant difference (p < 0.09)

**significant difference (p < 0.05)

Outcome measure	T0	T1
VO₂ peak (ml/min)*		
All**	1423.81 (\pm 233.88)	1532.95 (\pm 313.66)
Intervention	1394.42 (\pm 300.62)	1522.39 (\pm 284.69)
Control	1506.69 (\pm 373.86)	1562.72 (\pm 386.80)
VO₂ peak(ml/kg/min)		
All**	20.78 (\pm 5.27)	22.29 (\pm 5.23)
Intervention	20.17 (\pm 5.19)	21.95 (\pm 5.19)
Control	22.5 (\pm 5.18)	23.26 (\pm 5.28)
Peak power (Watt)**		
All	105.83 (\pm 25.81)	116.34 (\pm 26.79)
Intervention**	102.92 (\pm 22.21)	115.86 (\pm 23.38)
Control	114.02 (\pm 32.76)	117.69 (\pm 34.98)
HR_{max} (beats/min)		
All	155.58 (\pm 24.84)	157.50 (\pm 24.57)
Intervention	154.84 (\pm 22.05)	156.85 (\pm 25.89)
Control	157.67 (\pm 31.67)	159.33 (\pm 34.98)
Peak ventilation (L/min)		
All**	56.41 (\pm 16.08)	60.44 (\pm 15.85)
Intervention	54.25 (\pm 15.31)	58.72 (\pm 13.93)
Control	62.61 (\pm 16.83)	65.4 (\pm 19.77)
Time to exhaustion (s)**		
All	661.70 (\pm 152.56)	722.86 (\pm 159.65)
Intervention**	642.74 (\pm 130.86)	718.09 (\pm 141.00)
Control*	715.20 (\pm 153.77)	736.29 (\pm 204.92)
Borg scale ergometer**		
All	18.09 (\pm 2.58)	18.02 (\pm 2.70)
Intervention	17.73 (\pm 2.7)	17.5 (\pm 2.95)
Control	19.11 (\pm 1.84)	19.47 (\pm 0.65)
6MWT (m)**		
All	535.17 (\pm 80.66)	581.83 (\pm 77.36)
Intervention**	529.61 (\pm 80.28)	581.67 (\pm 71.45)
Control**	550.95 (\pm 80.72)	562.26 (\pm 93.21)
Borg scale 6MWT		
All	11.74 (\pm 2.34)	11.89 (\pm 2.40)
Intervention	12.01 (\pm 2.16)	12.03 (\pm 2.40)
control	10.97 (\pm 2.97)	11.49 (\pm 2.40)

Abbreviations: VO₂peak, peak oxygen consumption; HR_{max}, peak heart rate; 6MWT, six minute walking test

[†]trend to significant difference (p < 0.09)

**significant difference (p < 0.05)

Outcome measures	T0	T1
Body weight (kg)		
All	71.18 (\pm 16.01)	70.98 (\pm 15.45)
Intervention	72.23 (\pm 16.94)	71.98 (\pm 16.23)
Control	68.18 (\pm 12.73)	68.10 (\pm 12.70)
BMI (kg/m²)		
All	26.20 (\pm 5.55)	26.12 (\pm 5.30)
Intervention	26.62 (\pm 5.84)	26.53 (\pm 5.55)
Control	24.99 (\pm 4.47)	24.96 (\pm 4.40)
Fat %**		
All	34.43 (\pm 7.25)	34.66 (\pm 7.17)
Intervention**	34.55 (\pm 7.70)	34.99 (\pm 7.60)
Control	34.07 (\pm 5.85)	33.72 (\pm 5.74)
waist circumference(cm)		
All	84.13 (\pm 13.43)	83.50 (\pm 12.53)
Intervention	85.10 (\pm 14.33)	84.23 (\pm 12.22)
Control	81.32 (\pm 10.02)	81.42 (\pm 10.16)
hip circumference (cm)		
All	108.62 (\pm 68.39)	103.00 (\pm 10.65)
Intervention	111.85 (\pm 79.13)	103.98 (\pm 11.32)
Control	100.12 (\pm 68.31)	100.20 (\pm 17.31)
WHR		
All	0.81 (\pm 0.09)	0.81 (\pm 0.07)
Intervention	0.81 (\pm 0.10)	0.81 (\pm 0.07)
Control	0.81 (\pm 0.07)	0.81 (\pm 0.06)

Abbreviations: BMI, body mass index; WHR, waist hip ratio

*significant difference (p < 0.05)

Outcome measures	T0	T1	T2
Facit – F			
All**	29.45 (\pm 10.40)	35.20 (\pm 9.75) [†]	36.00 (\pm 9.26) [†]
Intervention	27.67 (\pm 9.74)	34.33 (\pm 9.33)	34.9 (\pm 9.10)
Control	35.12 (\pm 10.53)	37.86 (\pm 10.67)	39.50 (\pm 9.05)
EORTC QLQ-C30[†]			
All**	47.97 (\pm 24.78)	35.76 (\pm 19.8) [†]	35.11 (\pm 20.5) [†]
Intervention	50.95 (\pm 23.38)	37.56 (\pm 16.71)	37.45 (\pm 19.83)
Control	38.2 (\pm 27.1)	29.86 (\pm 22.48)	27.43 (\pm 21.5)

[†]significant difference (p < 0.05)

*significantly different from T0 measurements

METHODS

Inclusion

- Between January 2014 and May 2015;
- Universitair Ziekenhuis Brussel + Virga Jesse Ziekenhuis Hasselt;
- Female breast cancer patients, 3 weeks to 1 year following active treatment, > 18 years old, no physical disabilities.

Intervention

- 12-week intervention;
- 4 hours of physical activity a week in the gym;
- Aerobic exercise at 70-80% of maximal heart rate (HRmax);
- Combined with strengthening training and resistance exercises;
- 1 psycho-educational session (lifestyle guidance) a week of 2 hours at the hospital (f.e. nutrition, physical activity, stress management, psycho-social topics, insomnia and sexuality);
- Control group with usual care.

Measurements

- Quasi experimental design;
- Measurements were carried out at baseline (T0), at the end of the intervention (T1) and at 12-weeks follow-up (T2);
- HRQoL (EORTC QLQ-C30 questionnaire), anxiety and depression (HADS questionnaire) and CRF (FACIT-Fatigue questionnaire), were measured at T0, T1 and T2;
- Physical fitness and anthropometrics were assessed at T0 and T1 using respectively spiro ergometrics, 6 minutes walking test (6MWT), bio-impedance and circumferential measurements.

Outcome measures	T0	T1	T2
Global status**			
All	56.21 (\pm 17.50)	64.76 (\pm 17.21)	66.13 (\pm 15.16)
Intervention**	54.21 (\pm 16.14)	65.00 (\pm 13.93) [†]	64.54 (\pm 14.88) [†]
Control**	62.78 (\pm 20.30)	64.06 (\pm 25.44)	71.35 (\pm 14.81) [†]
Physical function			
All**	72.12 (\pm 17.82)	79.80 (\pm 16.53) [†]	81.02 (\pm 15.42) [†]
Intervention	70.79 (\pm 17.13)	78.98 (\pm 16.53)	80.63 (\pm 15.46)
Control	76.46 (\pm 19.80)	82.90 (\pm 16.48)	82.29 (\pm 15.48)
Role function			
All**	60.10 (\pm 25.91)	72.87 (\pm 24.34) [†]	73.84 (\pm 24.15) [†]
Intervention	58.41 (\pm 24.91)	71.43 (\pm 23.76)	71.43 (\pm 23.99)
Control	65.63 (\pm 28.69)	77.51 (\pm 25.96)	81.77 (\pm 23.33)
Emotional function			
All**	63.32 (\pm 25.93)	73.36 (\pm 24.33) [†]	74.51 (\pm 21.24) [†]
Intervention	60.48 (\pm 24.90)	72.54 (\pm 22.82)	72.86 (\pm 20.90)
Control	72.66 (\pm 27.45)	76.04 (\pm 29.00)	79.95 (\pm 21.79)
Cognitive function			
All**	64.01 (\pm 27.67)	69.34 (\pm 26.29) [†]	70.43 (\pm 25.08) [†]
Intervention	62.26 (\pm 28.45)	68.98 (\pm 26.85)	68.41 (\pm 25.82)
Control	69.79 (\pm 25.48)	77.08 (\pm 24.23)	77.08 (\pm 22.70)
Social function			
All**	68.37 (\pm 28.17)	77.62 (\pm 25.52) [†]	77.88 (\pm 25.42) [†]
Intervention	66.03 (\pm 28.77)	76.19 (\pm 25.82)	76.03 (\pm 25.83)
Control	76.04 (\pm 25.02)	82.29 (\pm 25.02)	83.85 (\pm 23.37)
Fatigue			
All**	47.97 (\pm 24.78)	35.76 (\pm 19.8) [†]	35.11 (\pm 20.5) [†]
Intervention	50.95 (\pm 23.38)	37.56 (\pm 16.71)	37.45 (\pm 19.83)
Control	38.2 (\pm 27.1)	29.86 (\pm 22.48)	27.43 (\pm 21.5)

[†]significant difference (p < 0.05)

[†]significantly different from T0 measurements

Scores range from 0 to 100. High scores on the global and functional scales indicate good QOL.

Table 4c. Changes in QOL symptoms (mean \pm SD and p-values)			
Outcome measures	T0	T1	T2
Nausea/vomiting			
All	6.33 (\pm 11.98)	4.50 (\pm 10.79)	4.99 (\pm 13.31)
Intervention	6.83 (\pm 12.60)	5.24 (\pm 11.63)	5.72 (\pm 14.77)
Control	4.69 (\pm 9.69)	2.08 (\pm 7.02)	2.61 (\pm 6.15)
Pain			
All	31.02 (\pm 27.43)	27.13 (\pm 24.50)	24.94 (\pm 24.01)
Intervention	32.54 (\pm 27.58)	28.89 (\pm 24.92)	26.19 (\pm 23.09)
Control	26.04 (\pm 26.75)	21.35 (\pm 22.49)	20.83 (\pm 26.77)
Dyspnoea			
All**	25.06 (\pm 25.82)	14.38 (\pm 20.51) [†]	13.87 (\pm 20.86) [†]
Intervention	26.66 (\pm 26.72)	14.95 (\pm 20.12)	14.60 (\pm 20.63)
Control	19.79 (\pm 22.17)	12.5 (\pm 21.99)	11.46 (\pm 21.77)
Insomnia			
All	45.98 (\pm 35.27)	37.49 (\pm 33.41)	40.63 (\pm 30.98)
Intervention	48.89 (\pm 34.18)	39.39 (\pm 34.18)	40.95 (\pm 30.76)
Control	36.46 (\pm 35.28)	31.25 (\pm 30.45)	39.58 (\pm 32.17)
Appetite loss			
All**	13.14 (\pm 25.36)	6.33 (\pm 15.41) [†]	6.57 (\pm 16.59) [†]
Intervention	13.65 (\pm 25.19)	6.98 (\pm 16.47)	7.30 (\pm 17.89)
Control	11.46 (\pm 26.25)	4.17 (\pm 11.20)	4.17 (\pm 11.20)
Constipation			
All	14.84 (\pm 23.54)	14.60 (\pm 25.20)	13.14 (\pm 23.35)
Intervention	15.55 (\pm 23.60)	14.60 (\pm 25.29)	12.70 (\pm 23.29)
Control	12.50 (\pm 23.57)	14.58 (\pm 25.31)	14.56 (\pm 23.85)
Diarrhea			
All	5.60 (\pm 14.33)	5.11 (\pm 13.34)	5.84 (\pm 18.03)
Intervention	6.66 (\pm 14.91)	6.03 (\pm 14.45)	7.62 (\pm 20.28)
Control	2.08 (\pm 11.79)	2.08 (\pm 8.20)	0.00 (\pm 0.00)
Financial difficulty			
All	15.57 (\pm 28.21)	13.62 (\pm 21.22)	14.11 (\pm 25.48)
Intervention	17.46 (\pm 28.16)	14.26 (\pm 21.61)	13.65 (\pm 24.33)
Control	9.37 (\pm 17.42)	11.46 (\pm 20.05)	15.63 (\pm 29.31)
[†] Significantly different from T0 measurements			
*Trend to significant difference (p < 0.09)			
**Significant difference (p < 0.05)			
Scores range from 0 to 100. Low scores on the symptom scales represent less intense symptom experiences.			