# THE EFFECT OF PAIN NEUROSCIENCE EDUCATION AND BEHAVIOURAL GRADED ACTIVITY IN BREAST CANCER SURVIVORS: A RANDOMISED CONTROLLED MULTI-CENTER TRIAL

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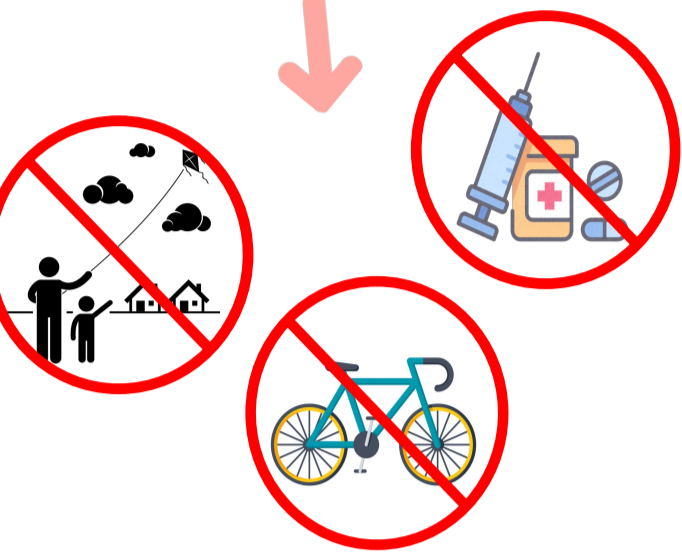## BACKGROUND
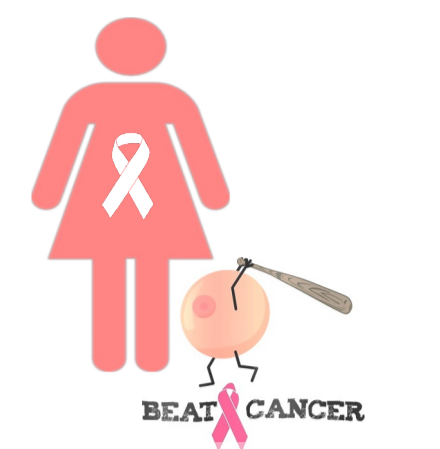
The survival rate of **Breast Cancer Survivors (BCS)** is rising up to 89.9%
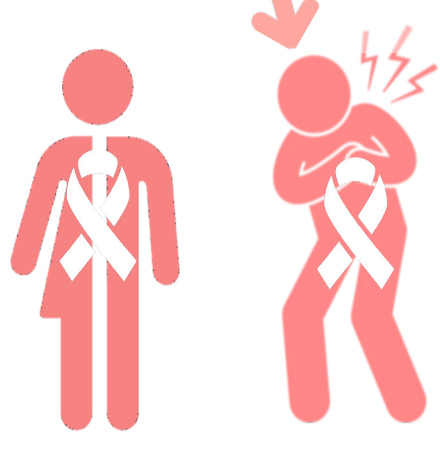
Debilitating side-effects can persist in BCS, of which Chronic pain (CP) is one of the most prevalent ones. Affecting 1 out of 2 BCS after treatment.

Pain reduces HRQoL↘ and activity levels↘ and pain medication has side-effects on the long term.

There is a need for non-pharmacological treatments, such as **Pain Neuroscience Education** (i.e., explaining the neurophysiology of pain), combined with **Behavioural Graded Activity** (i.e., increasing the patient's meaningful activities)

AIM

THE PRIMARY OBJECTIVE: Investigate whether **PNE with BGA** has an added value in **decreasing pain** compared to the usual care in BCS with chronic pain.

THE SECONDARY OBJECTIVES: Investigate whether **PNE with BGA** has the ability to **improve endogenous pain modulation and HRQoL** compared to the usual care in BCS with chronic pain.

METHODS

INCLUSION

✓ Breast Cancer Survivor
✓ Pain Visual Analogue Scale ≥ 3/10
✓ Cancer Free
✓ Treatment completed ≥ 3m
✓ Dutch reading and speaking

INTERVENTION

n=122

RANDOMISED — n = 62 → INTERVENTION GROUP — 1 session of PAIN NEUROSCIENCE EDUCATION + 6 sessions of BEHAVIOURAL GRADED ACTIVITY

n = 60 → USUAL CARE GROUP — Leaflet

OUTCOME MEASURES

Brief Pain Inventory - BPI
European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 - EORTC-QLQ-C30
Douleur Neuropathique 4 – DN4
Central Sensitisation Index – CSI
International Physical Activity Questionnaire – IPAQ-SF
Productivity Cost Questionnaire – PCQ
Medical Cost Questionnaire – MCQ
Pittsburgh Sleep Quality Index – PSQI
Insomnia Severity Index – ISI
Fatigue Severity Scale – FSS
Pain Catastrophizing Scale – PCS
Injustice Experience Questionnaire – IEQ
Pain Vigilance and Awareness – PVAQ
Depression, Anxiety and Stress Scale - DASS-21
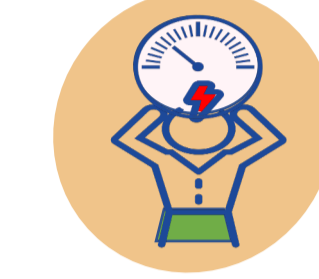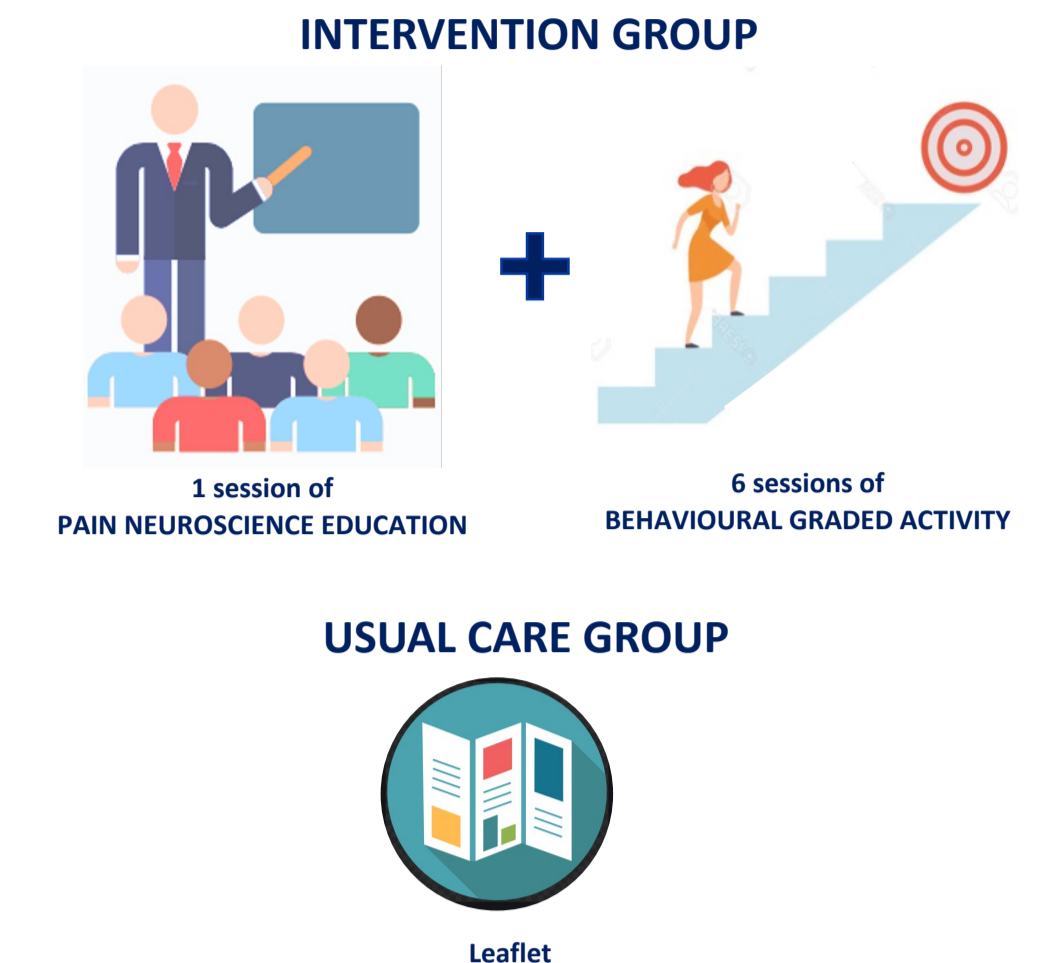
Endogenous Pain Modulation
Performed on three locations:
M. Pectoralis, Most painful area and *M. tibialis anterior*
Pain and Detection Thresholds:
Pressure (algometer and cuff), Warmth and Cold
Temporal Summation:
Pressure (algometer)
Conditioned Pain Modulation: Pressure (cuff)
Stimuli - Pressure (algometer), Warmth and Cold

STATISTICAL ANALYSIS

Linear mixed models for repeated measures in SPSS

RESULTS

BASELINE → **12 WEEKS INTERVENTION** → POST-INTERVENTION → 3 MONTHS → 12 MONTHS

	POST-INTERVENTION	3 MONTHS	12 MONTHS
PRIMARY OUTCOME MEASURES – PAIN (BPI (0-10))			
Pain severity	↑	↑	↑
Pain interference	↑	↑	↑
Worst pain	↑	=	=
SECONDARY OUTCOME MEASURES – HEALTH-RELATED QUALITY OF LIFE (EORTC-QLQ-C30 (0-100))			
HRQoL	↑↑	↑	↑
SECONDARY OUTCOME MEASURES – ENDOGENOUS PAIN MODULATION			
Cuff	=	=	-
Pressure pain thresholds	=	=	-
Warmth pain thresholds	=	=	-
Cold pain thresholds	=	=	-
Conditioned pain modulation	=	=	-
Pressure (Δkgf)	=	=	-
Warmth (Δ°C)	=	=	-
Cold (Δ°C)	=	=	-
Temporal Summation (ΔVAS)	=	=	-
EXPLANATORY OUTCOME MEASURES			
Central sensitization (CSI (0-100))	↑	=	=
Neuropathic symptoms (DN4 (0-10))	=	=	=
Perceived injustice (IEQ (0-48))	↑	=	↑
Pain catastrophizing (PCS (0-52))	↑	=	↑
Pain vigilance and awareness (PVAQ (0-80))	↑	↑	=
Stress (DASS21 Stress (0-21))	=	=	=
Anxiety (DASS21 Anxiety (0-21))	=	=	=
Depression (DASS21 Depression (0-21))	=	=	=
Physical activity (IPAQ (METs))	↑	=	=
Fatigue (FSS (1-7))	=	=	=
Sleep (PSQI (0-21))	=	=	=
Insomnia (ISI (0-28))	=	=	=

TABLE LEGEND

↑ improvement in favour of the PNE with BGA

Cohen's d effect sizes are interpreted as
↑↑↑ Large (0.80-1.29)
↑↑ Medium (0.50-0.79)
↑ Small (0.20-0.49)
= Negligible (<0.20)

Significant values (p<0.05) are in GREEN

PROTOCOL REGISTRATION

CONCLUSION

PNE with BGA did result in a significant short-term reduction in **pain** severity and interference compared to usual care in BCS with chronic pain. Additionally, significant improvements in **maladaptive cognitions** were observed.

However, observed changes in pain **did not significantly improve patients' HRQoL and endogenous pain modulation.**

VUB | RERE REHABILITATION RESEARCH GROUP

VUB | PAIN IN MOTION RESEARCH GROUP

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