Supplementary Materials

Supplementary Table 1. MEDLINE search expression in OVID®.

#	Search
1	exp Breast Neoplasms/
2	(breast and (cancer* or carcinoma* or tumo?r* or neoplas*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
3	1 or 2
4	exp catatonia/ or exp depression/ or exp self-injurious behavior/ or exp anxiety/
5	mental disorders/ or exp anxiety disorders/ or exp "bipolar and related disorders"/ or exp "disruptive, impulse control, and conduct disorders"/ or exp dissociative disorders/ or "feeding and eating disorders"/ or anorexia nervosa/ or binge-eating disorder/ or bulimia nervosa/ or pica/ or exp mood disorders/ or exp motor disorders/ or neurocognitive disorders/ or amnesia/ or cognition disorders/ or auditory perceptual disorders/ or mild cognitive impairment/ or consciousness disorders/ or delirium/ or dementia/ or exp neurotic disorders/ or exp personality disorders/ or exp "schizophrenia spectrum and other psychotic disorders"/ or sexual dysfunctions, psychological/ or exp sleep wake disorders/ or exp somatoform disorders/ or exp substance-related disorders/ or exp "trauma and stressor related disorders"/
6	(depressi* or dysthymia or catatonia or self-injur* or self-injury or self-injurious or self-mutilation or "self mutilation" or suicid* or self-harm or "self harm" or "self injury" or anxious* or anxiety or (panic adj1 (disorder# or attack#)) or catastrophi* or (mental adj1 (disorder or disorders)) or phobia or phobic or neurotic or (compulsive adj1 disorder) or bipolar or neurotic or (personality adj1 disorder) or psychotic or psychosis or paranoid or delusional or (sexual adj1 (disorder or dysfunction or problem#)) or insomnias or (sleep adj1 (disorder or dysfunction or problem#)) or somatoform or (substance adj3 (disorder or problem#)) or stress ajd3 disorder or (adjustment adj3 disorder)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
7	4 or 5 or 6
8	(prevalence# or frequenc* or incidence# or risk or rate* or ratio or odds or epidemiolog* or percent* or outcomes or hazard).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]
9	3 and 7 and 8
10	Humans/
11	Animals/
12	10 and 11
13	11 not 12
14	9 not 13

Supplementary Table 2. Criteria used to judge the risk of bias in the systematic review studies.

Judgment	Selection bias	Outcome variable: information bias	Design-specific source of bias (temporality)	Confounding by age and socio-economic status	Statistical methods	Missing data	Conflict of interest
Low risk of bias	Describes the source and methods of selection of the participants AND Eligibility criteria given AND (Participants selected at random OR population-based study) AND Proportion of participation >50% AND/OR ≤30% of attrition (for cohort studies with a pre-defined follow up time for the entire cohort)	Outcome assessed through one of the following: Psychiatric interviews OR Evidence of having been prescribed anxiolytics (for anxiety) and antidepressants (for depression) OR Record of a diagnostic code for mental health (for studies including electronic health records) OR Country's official mortality registry data (for completed suicide) OR Objective data on the trajectories of cognitive function over time (for neurocognitive dysfunction)	The breast cancer diagnosis preceded the onset of the mental health outcome OR Diagnosis of the relevant outcome prior to the BC diagnosis taken into account by restriction, matching or in multivariate analysis	The study attempts to minimise confounding using one or more of the following: Matching for age and for an indicator of socio-economic status (e.g. education, attending the same primary care practice, or small geographic area) AND/OR Multivariate analysis, reporting mean scores or association measures, adjusted for age and a socio-economic status indicator	Appropriate use of statistics for primary analysis of effect (specific to each study design and data)	≤15% of missing data (for studies with questionnaires), with or without multiple imputation methods for missing data OR >15% of missing data, with missing data imputed using multiple imputation methods	The study authors explicitly report the existence, or not, of conflicts of interests OR The study's funding source is acknowledged
High risk of bias	Participants not selected at random OR Proportion of participation ≤50% OR Women selected on the basis of a the relevant mental health outcome for this review OR >30% of attrition (for cohort studies with a pre-defined follow up time for the entire cohort)	Self-reported intake of anxiolytics (for anxiety) OR antidepressants (for depression)	Unclear whether the onset of the mental health outcome occurred before or after the breast cancer diagnosis OR Diagnoses of mental disorders before the onset of the BC not considered	The study only reports crude measures of frequency or association (e.g. univariate association, or mean scores of the instrument) OR (There are differences between the two the group of breast cancer survivors and the women in the comparison group for age OR for an indicator of socio-economic status)	Not appropriate use of statistics for primary analysis of effect	>15% of missing data (for studies using questionnaires), with missing data imputed with a measure of central tendency	The presence or absence of conflicts of interest is not reported and thus unknown AND No study's funding source is acknowledged
Unclear risk of bias	Unknown method of participants' recruitment OR Unknown exclusion criteria OR Unknown participation rate	Outcome assessed using self-reported scales	Not applicable	The study reports mean scores or measured of associations that were adjusted for an unclear or unknown list of potential confounders	Statistical methods not reported	Proportion of missing data not reported (for studies involving questionnaires) Not applicable if the study uses data from diagnoses ascertained via electronic records, or if formal statistical comparisons between breast cancer survivors and women who did not have cancer could not be done.	Not applicable

Supplementary Table 3. Anxiety: main characteristics and results of the studies that compared the risk, prevalence or severity of anxiety (disorders or symptoms) between breast cancer survivors (>1 year) and women who did not have cancer.

First author, year of publication Country	Breast cancer survivors Type of population and main characteristics	Stage at diagnosis (%)	Breast cancer treatments (%)	Time since diagnosis/ treatment in years: mean/ median (SD), range	Comparison group Type of population and main characteristics	Outcome assessment	Quantitative measure of the outcome Breast cancer survivors	Comparison group	Relative risk estimate (RR, OR, SIR, PR)	P-value or 95% confidence interval	Notes
Electronic health records											
Hjerl et al., 2002 [1] Denmark (continues)	Population-based All 60,431 women aged >15 years with a first primary invasive breast cancer registered in the national Cancer Registry in 1970-1993.	All	ND	4 (ND), 0-15 (Median cohort follow up: 4 years since diagnosis; range: 0 to 15)	Population-based Danish female population aged >15 years.	EHR, first ever psychiatric admission, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 300.81 and 300.00-300.99, except 300.49	Cumulative incidence: 0.25%	Cumulative incidence: 0.20%	SIR= 1.3 *	95%CI: 1.1-1.5	
									By age: 30-34: SIR= 1.93 35-39: SIR= 1.28 40-44: SIR= 0.91 45-49: SIR= 0.89 50-54: SIR= 1.24 55-59: SIR= 1.56 * 60-64: SIR= 1.18 65-69: SIR= 1.42 70-74: SIR= 1.98 * 75-79: SIR= 0.47 80-84: SIR= 1.27 85-89: SIR= 2.91 ≥90: SIR= 8.74	By age: 95%CI:0.69-4.15 95%CI:0.58-2.38 95%CI:0.48-1.52 95%CI:0.54-1.37 95%CI:0.84-1.76 95%CI:1.04-2.22 95%CI:0.69-1.86 95%CI:0.81-2.26 95%CI:1.12-3.21 95%CI:0.08-1.46 95%CI:0.21-3.91 95%CI:0.17-12.8 95%CI:0.50-38.5	Standardised incidence ratio estimated considering all follow up time since diagnosis.
									By calendar period: 1970-74: SIR=1.11 1975-79: SIR=1.15 1980-84: SIR=1.04 1985-89: SIR=1.80 * 1990-93: SIR=0.89	By calendar period: 95%CI:0.58-1.91 95%CI:0.78-1.61 95%CI:0.72-1.45 95%CI:1.37-2.31 95%CI:0.55-1.35	-
	Women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993 and living outside Copenhagen city area (non-metropolitan).	All	ND	4 (ND), 0-15	Female population aged >15 years and living outside Copenhagen city area (non-metropolitan).	EHR, first ever psychiatric admission, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 300.81 and 300.00-300.99, except 300.49	-	-	SIR= 1.3 *	95%CI: 1.1-1.5	Standardised incidence ratio estimated considering all follow up time since diagnosis.
				1.5			-	-	SIR= 1.4	95%CI: 0.8-2.1	Approximate SIR values estimated from the graphics provided in the original study.
				2.5			-	-	SIR= 1.1	95%CI: 0.6-1.8	
				3.5			-	-	SIR= 1.6	95%CI: 0.9-2.5	
				4.5			-	-	SIR= 1.5	95%CI: 0.6-2.4	
				5.5			-	-	SIR= 0.7	95%CI: 0.3-1.6	
				6.5			-	-	SIR= 1.3	95%CI: 0.5-2.6	
				7.5			-	-	SIR= 1.2	95%CI: 0.4-2.5	
				8.5			-	-	SIR= 0.8	95%CI: 0.3-2.2	
				9.5			-	-	SIR= 0.7	95%CI: 0.2-2.1	
				10.5			-	-	SIR= 0.4	95%CI: 0.1-1.9	
				11.5			-	-	SIR= 1.0	95%CI: 0.3-2.9	
				12.5			-	-	SIR= 2.6	95%CI: 0.8-6.0	
				13.5			-	-	SIR= 0.5	95%CI: 0.1-2.1	

Hjerl et al., 2002 [1] Denmark (continued)	Women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993 and living in Copenhagen city area (metropolitan).	All	ND	4 (ND), 0-15	Female population aged >15 years and living in Copenhagen city area (metropolitan).	EHR, first ever psychiatric admission, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 300.81 and 300.00-300.99, except 300.49	-	-	SIR= 1.1	95%CI: 0.8-1.6	Standardised incidence ratio estimated considering all follow up time since diagnosis.
				1.5			-	-	SIR= 1.4	95%CI: 0.5-2.5	
				2.5			-	-	SIR= 1.5	95%CI: 0.4-3.0	
				3.5			-	-	SIR= 0.7	95%CI: 0.2-2.2	
				5.0			-	-	SIR= 0.8	95%CI: 0.3-1.8	Approximate values estimated from the graphics provided in the original study.
				6.5			-	-	SIR= 1.3	95%CI: 0.4-4.0	
				7.5			-	-	SIR= 3.3	95%CI: 1.0-7.6	
				9.5			-	-	SIR= 0.5	95%CI: 0.1-1.8	
				13.0			-	-	SIR= 0.7	95%CI: 0.1-2.9	
Hung et al., 2013 [2] Taiwan	Population-based 26,629 women with no prior mood disorder and cancer, with breast cancer registered in the National Health Insurance Database in 2000-2005.	All	ND	2.7 (ND), ND-7 (median follow up years for breast cancer survivors: 2.7; for matched cohort: 3.2)	Population-based 26,629 women randomly selected from 1 million women who did not have breast cancer registered in the same database, individually matched for age and Charlson comorbidity score (categories of matching not reported).	EHR, recorded in the Registry for Catastrophic Illness with an ICD-9-CM code for anxiety (300-300.3, 300.5, 300.7-300.9)	Incidence rate: 49.64 per 1,000 person-years Cumulative incidence: 15%	Incidence rate: 40.82 per 1,000 person-years Cumulative incidence: 14%	RR= 1.22 *	95%CI: 1.16-1.27	Includes patients diagnosed with breast cancer at <1yr.
				2			Cumulative incidence: 11%	Cumulative incidence: 9%	RR= 1.22 * †	95%CI: 1.16-1.29	Approximate cumulative incidence values estimated from the graphics provided in the original study.
				4			17%	15%	RR= 1.13 * †	95%CI: 1.09-1.18	
				6			22%	20%	RR= 1.10 * †	95%CI: 1.06-1.14	
Khan et al., 2010 [3] United Kingdom	Population-based 16,938 women aged ≥30 with breast cancer registered in the UK General Practice Research Database.	All	ND	ND (ND), ≥5	Population-based 67,649 women who did not have breast or colorectal cancer at beginning of follow up; individually matched for age (± 1 year) and primary care practice (small area).	EHR, having primary care consultations for anxiety	Prevalence: 5.4%	Prevalence: 5.0%	OR= 1.06	95%CI: 0.97-1.16	Odds ratio adjusted for Charlson comorbidity score, previous history of anxiety and death.
						EHR, being prescribed an anxiolytic at least once	Prevalence: 9.0%	Prevalence: 7.7%	OR= 1.08 *	95%CI: 1.01-1.15	Odds ratio adjusted for Charlson comorbidity score, number of consultations, and death.
Yang et al., 2017 [4] Sweden (continues)	Population based All 4,402 women diagnosed with an in situ breast cancer at the age of 20-80 years between 2001-2009	0	ND	4.7 (4.4), 0-10 (median (IQR) duration of follow up: 4.7 (4.4))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for anxiety (F40-F41) at in patient or outpatient hospital visits	Cumulative incidence: 0.9%	Cumulative incidence: 0.9%	SIR= 0.99 By age group: 20-44: SIR= 1.18 45-54: SIR= 0.97 55-64: SIR= 0.95 65-80: SIR= 0.91	95%CI: 0.73-1.34 By age group: 95%CI: 0.59-2.36 95%CI: 0.57-1.64 95%CI: 0.53-1.72 95%CI: 0.45-1.81	Standardised incidence ratio estimated considering all follow up time since diagnosis.
				0-0.5			<0.1%	0.1%	SIR= 0.53	95%CI: 0.13-2.12	Standardised incidence ratios were standardised by calendar period (1-year categories), age (5-year categories), and region of residence (North, Stockholm-Gotland, South, Southeast, Uppsala-Orebro, West).
				0.5-1			0.0%	0.0%	-	-	
				1-2			0.3%	0.2%	SIR= 1.62	95%CI: 0.92-2.85	
				2-5			0.4%	0.4%	SIR= 1.09	95%CI: 0.68-1.73	
				5-10			0.2%	0.2%	SIR= 0.90	95%CI: 0.47-1.74	

Yang et al., 2017 [4] Sweden (continued)	Population based All 4,402 women diagnosed with an in situ breast cancer at the age of 20-80 years between 2001-2009	0	ND	4.7 (4.4), 0-10 (median (IQR) duration of follow up: 4.7 (4.4))	452,507 women randomly selected from the respondents to the 1990 census	EHR, being prescribed an anxiolytic (group N05B of the ATC classification system)	Cumulative incidence: 4.5%	Cumulative incidence: 2.8%	SIR= 1.64 * By age group: 20-44: SIR= 1.52 45-54: SIR= 1.69 * 55-64: SIR= 1.57 * 65-80: SIR= 1.69 *	95%CI: 1.43-1.88 By age: 95%CI: 0.96-2.42 95%CI: 1.28-2.22 95%CI: 1.22-2.02 95%CI: 1.34-2.14	Standardised incidence ratio estimated considering all follow up time since diagnosis. Standardised incidence ratios were standardised by calendar period (1-year categories), age (5-year categories), and region of residence (North, Stockholm-Gotland, South, Southeast, Uppsala-Orebro, West). The following were significant predictors of increased anxiety among breast cancer survivors: younger age at diagnosis, presence of co-morbidities, having moderate and high histological grade, and having had chemotherapy.
				0-0.5			-	-	SIR= 3.86 *	95%CI: 3.17-4.71	
				0.5-1			-	-	SIR= 0.93	95%CI: 0.61-1.41	
				1-2			-	-	SIR= 1.28	95%CI: 0.97-1.70	
				2-4.5			-	-	SIR= 0.91	95%CI: 0.64-1.28	
	Population based All 40,849 women diagnosed with an invasive breast cancer at the age of 20-80 years between 2001-2009	I-IV	ND	4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for anxiety (F40-F41) at in patient or outpatient hospital visits	Cumulative incidence: 1.4%	Cumulative incidence: 0.9%	SIR= 1.55 * By age group: 20-44: SIR= 1.84 * 45-54: SIR= 1.56 * 55-64: SIR= 1.58 * 65-80: SIR= 1.31 *	95%CI: 1.43-1.68 By age group: 95%CI: 1.54-2.21 95%CI: 1.34-1.81 95%CI: 1.35-1.84 95%CI: 1.10-1.56	
				0-0.5			0.2%	0.1%	SIR= 2.53 *	95%CI: 2.05-3.13	
				0.5-1			0.2%	0.1%	SIR= 2.30 *	95%CI: 1.85-2.87	
				1-2			0.3%	0.2%	SIR= 2.00 *	95%CI: 1.69-2.38	
				2-5			0.4%	0.4%	SIR= 1.17 *	95%CI: 1.01-1.36	
				5-10			0.3%	0.2%	SIR= 1.18	95%CI: 0.97-1.42	
	Population based All 40,849 women diagnosed with an invasive breast cancer at the age of 20-80 years between 2001-2009	I-IV	ND	4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, being prescribed an anxiolytic (group N05B of the ATC classification system)	Cumulative incidence: 6.4%	Cumulative incidence: 2.5%	SIR= 2.52 * By age group: 20-44: SIR= 3.96 * 45-54: SIR= 3.04 * 55-64: SIR= 2.50 * 65-80: SIR= 2.04 *	95%CI: 2.43-2.62 By age group: 95%CI: 3.56-4.40 95%CI: 2.81-3.30 95%CI: 2.33-2.68 95%CI: 1.91-2.17	
				0-0.5			-	-	SIR= 6.13 *	95%CI: 5.81-6.47	
				0.5-1			-	-	SIR= 1.90 *	95%CI: 1.72-2.10	
				1-2			-	-	SIR= 1.47 *	95%CI: 1.35-1.61	
				2-4.5			-	-	SIR= 1.38 *	95%CI: 1.26-1.52	
Studies involving scales											
Cohen et al., 2011 [5] Israel	Convenience sample 56 married Israeli Arab breast cancer survivors, post treatment and free of disease recruited from one hospital.	I-III (ND%)	Srg, C: 48.2% Srg, M: 51.8% Srg, R: 12.5% CT: 85.7% RT: 85.7% HT: 58.9%	4.8 (4.2), 1-17	Convenience sample 66 married and 'healthy' Arab women living in Israel, approached in community settings; individually matched for age and education (matching categories not reported).	BSI-18	BSI-18 mean score (SD): 2.7 (1.2)	BSI-18 mean score (SD): 2.2 (0.9)	-	P<0.05 *	Higher levels of anxiety associated with higher levels of depression, somatization and emotional distress in both groups (P<0.001). Higher levels of anxiety associated with lower body image in breast cancer survivors only (P=0.05).

Boehmer et al., 2015 [6] ND	Convenience sample 85 lesbian or bisexual breast cancer survivors post-active treatment recruited via advertisements, flyers, etc. (3.5% of whom had had cancer recurrence).	I-III (100%)	ND	4.5 (ND), 1-10	Convenience sample 85 lesbian or bisexual women with no history of cancer, not using hormone therapy, recruited via flyers, advertisements, etc.; individually matched for age (± 3 years) and partner status (partnered vs. unpartnered).	Anxiolytics intake (self-reported)	Prevalence: 3.5%	Prevalence: 1.2%	PR=2.92 †	95%CI: 0.31-27.1	Anxiety was more common in women taking any psycho pharmacological medication, compared to those who did not (OR=3.78, 95%CI: 1.76 to 8.09).
						HADS score ≥8	Prevalence: 45.2%	Prevalence: 36.5%	PR=1.24 †	95%CI: 0.86-1.78	
Calvio et al., 2010 [7] United States	Convenience sample 122 breast cancer survivors, working full-time for ≥1 year, with computer and internet, recruited via advertisements and flyers.	I (36.9%) II (44.3%) III (17.2%)	Srg, ND: 96.7% CT: 82.8% RT: 73.0% HT: 45.9% IT: 13.1%	3.1 (2.4), 1-10	Convenience sample 113 women without cancer, working full-time for ≥1 year, with computer and internet, recruited via advertisements and flyers.	HADS	HADS mean score (SD): 7.8 (3.0)	HADS mean score (SD): 7.1 (2.6)	-	P<0.01 *	Higher HADS scores indicate more anxiety symptoms. Mean scores adjusted for marital status (cohabitating with partner vs. single/not cohabitating), race (Caucasian vs. non-Caucasian), ethnicity (Hispanic vs. non-Hispanic), age (<40, 41-50, 51-65), income (0-39,000; 40-59,000; 60-79,000; 80-89,000; 80-99,000; ≥100,000), and menopausal status (currently going through, premenopausal, postmenopausal).
Dahl et al., 2011 [8] Norway	Convenience sample 337 tumor free breast cancer survivors treated with radiotherapy during 1998 and 2002 in one hospital.	II (ND) III (ND)	Srg, C: 24% Srg, M: 76% CT: 82% RT: 100% HT: 81%	3.9 (ND), 2.6-6.9	Convenience sample 1,685 women randomly selected from a population-based sample of women with no history of cancer who provided questionnaires with complete data; individually matched for age (± 5 years).	HADS	HADS mean score (SD): 6.3 (2.8)	HADS mean score (SD): 4.8 (3.7)	-	P<0.001 *	Higher HADS score indicates more anxiety symptoms. Mean scores adjusted for level of education, on disability pension and menopausal status. Higher scores of HADS for anxiety were associated with more insomnia symptoms in breast cancer survivors and in controls (p<0.001).
Miao et al., 2016 [9] China	Convenience sample 23 patients with breast cancer who had been treated with chemotherapy at a local hospital.	I-III (100%)	CT: 100%	3 (0.3),	Convenience sample 26 age-matched healthy controls selected amongst patients relatives and local universities; matched for age (matching method not reported).	HRS-A	HRS-A mean score (SD): 4.96 (1.43)	HRS-A mean score (SD): 4.5 (1.22)	-	P=0.232	Higher HRS-A score indicates more anxiety symptoms.

Rubino et al., 2007 [10] Italy	Convenience sample 33 consecutive patients who had had breast-reconstruction after mastectomy, in 2001-2002.	ND	Srg, M: 100% Srg, R: 100%	ND (ND), >1	Convenience sample 33 'healthy' women, randomly selected amongst the personnel of the local university.	HRS-A, applied during psychiatric interview Cut-off score: >14	Prevalence: 24.2%	Prevalence: 0.0%	PR=7.99 * †	95%CI: 1.06-60.34	PR calculated by the authors of the present study. For calculation purposes, it was assumed that one person in the non-cancer group had the outcome.
Boele et al., 2015 [11] The Netherlands	Convenience sample Post-menopausal breast cancer survivors with no diagnosis of psychiatric illness, not treated with adjuvant CT, selected from the medical records of the Cancer Institute.	ND	Srg, ND: 95% CT: 0% RT: 65% HT: 100% / 0%	Exposure to HT: 3.2 (1.9), 1.5-7; Unexposed to HT: 2.8 (0.3), 2.3-3.3.	Convenience sample 44 friends or family members of the women who had had breast cancer, with no history of breast cancer, matched for age and education (method of matching not reported).	HSCL-25	HSCL-25 mean score (SD): HT: 11.17 (10.39) No HT: 13.57 (11.74)	HSCL-25 mean score (SD): 9.92 (10.55)	-	P=0.30	Higher HSCL-25 score indicates more anxiety symptoms. P adjusted for age and estimated premorbid IQ. Women with higher anxiety levels had significantly lower processing speed evaluated as part of cognitive function.
Kreukels et al., 2008 [12] The Netherlands	Convenience sample 63 women who had non-metastatic breast cancer, with no history of psychiatric diseases.	I-III (100%)	CT: 100% HT: 40%	~ 1 (follow up at 12 months after CT)	Convenience sample 60 friends or family of the patients with the same age who never had cancer, matched for age (method of matching not reported).	HSCL-25	HSCL-25 mean score (SD): 16.3 (12.2)	HSCL-25 mean score (SD): 8.7 (7.9)	-	P<0.001 *	Higher HSCL-25 score indicates more anxiety symptoms.
Amir et al., 2002 [13] Israel	Convenience sample 39 women free of cancer symptoms for ≥3 years and not under active treatment, identified through 2 hospitals.	I (46%) II (46%) III (8%)	Srg, C: 20% Srg, M: 80% CT: 66% RT: 41% HT: 46%	6.5 (ND), ≥5	Convenience sample 39 women who did not experience life-threatening disease, recruited by unknown methods, matched for age and education (method of matching not reported).	SCL-90	SCL-90 mean score (SD): 0.87 (0.96)	SCL-90 mean score (SD): 0.49 (0.35)	-	P<0.001 *	Higher SCL-90 scores indicate more anxiety symptoms. Women who had breast cancer and reported PTSD symptoms had higher anxiety levels than those who did not report PTSD symptoms: 1.81 (1.23) vs. 0.67 (0.76), P<0.01.
Garcia-Torres et al., 2013 [14] Spain	Convenience sample 22 breast cancer survivors, free of relapse, identified by staff of the local association against cancer.	ND	Srg, M: 100% CT: 72.7%	8.2 (5.6), 1-21	Convenience sample 22 women with no history of cancer who volunteered with the same association against cancer.	ISRA (trait anxiety)	ISRA mean score (SD): 155.13 (71.51)	ISRA mean score (SD): 157.29 (82.45)	-	P=0.92	Correlation between anxiety and depression: r = 0.46, p<0.05.

Castellon et al., 2004 [15] United States	Convenience sample 53 women who had breast cancer at or before the age of 50, with no evidence of disease or recurrence, and no history of psychiatric disorder.	0-II (100%)	CT: 34% CT+HT: 34%	ND (ND), 2-5	Convenience sample 19 Healthy women recruited via fliers, newsletter articles and advertisements, or amongst the acquaintances of the hospital staff.	STAI (trait anxiety)	STAI mean score (SD), by treatment No CT: 31.9 (7.3) CT: 33.1 (8.1)	STAI mean score (SD): 38.0 (9.3)	-	P=0.075	Higher STAI scores indicate more anxiety symptoms.
Weitzner et al., 1997 [16] ‡ United States	Convenience sample 60 women with age <70 years, education ≥6th grade, no history of psychiatric diagnoses, >5 years disease-free, selected from those returning to the hospital for long-term follow up of cancer.	I (15%) II (63%) III (22%)	Srg, M: 100%	ND (ND), ≥5	Convenience sample 93 employees or volunteer workers at the same hospital with no personal or family history of breast cancer, age <70 years, education ≥6th grade, and no history of psychiatric diagnosis.	STAI (mild to moderate trait anxiety)	Prevalence: 27%	Prevalence: 15%	PR=1.8 †	95%CI: 0.95-3.41	Cut-off to be identified as case defined as >1 standard deviation above the mean.
						STAI (trait anxiety)	STAI mean score (SD): 35 (ND)	STAI mean score (SD): 33 (ND)	-	P<0.05 *	Adjusted for years of age and years of education. Women with stage III breast cancer at diagnosis had more trait anxiety compared to the other breast cancer survivors (P<0.004). Trait anxiety in breast cancer survivors was predictive of all domains of quality of life, except family functioning.
Root et al., 2015 [17] United States	Convenience sample 113 women aged <70 years who had breast cancer, were post-menopausal at diagnosis, receiving HT at recruitment, with no recurrence, no neurological or psychiatric diagnoses and who did not report sleep disturbances.	I (58%) II (0%) III (33%) IV (8%)	Srg, C: 75% Srg, M: 32% CT: 52% RT: 78% HT: 52%	4.2 (1.2)	Convenience sample 37 health women with no history of cancer or cancer treatment, post-menopausal, with no neurological or psychiatric diagnoses, matched for age and education (method of matching not reported).	STAI	STAI mean score (SD): 32.4 (8.6)	STAI mean score (SD): 33.1 (1.4)	-	P=0.62	Higher STAI scores indicate more anxiety symptoms.
Castellon et al., 2004 [15] United States	Convenience sample 53 women who had breast cancer at or before the age of 50, with no evidence of disease or recurrence, and no history of psychiatric disorder.	0-II (100%)	CT: 34% CT+HT: 34%	ND (ND), 2-5	Convenience sample 19 Healthy women recruited via fliers, newsletter articles and advertisements, or amongst the acquaintances of the hospital staff.	STAI (state anxiety)	STAI mean score (SD), by treatment No CT: 24.6 (3.6) CT: 28.6 (8.8)	STAI mean score (SD): 33.2 (8.0)	-	P=0.01 *	Higher STAI scores indicate more anxiety symptoms.

Conroy et al., 2013 [18] United States	Convenience sample 24 breast cancer survivors with history of non-metastatic disease and chemotherapy treated.	I (29%) IIa (33%) IIb (25%) IIIa (8%) IIIb (4%)	CT: 100% RT: 79%	6.4 (2.1), 3.2-10.2	Convenience sample 23 healthy women matched for age and education (categories of matching not reported)	STAI (state anxiety)	STAI mean score (SD): 30.2 (7.9)	STAI mean score (SD): 31.9 (9.1)	-	P>0.05	Higher STAI scores indicate more anxiety symptoms.
McDonald et al., 2010 [19] ND	Convenience sample 29 female breast cancer patients without neurobehavioral risk factors including neurologic, medical, or psychiatric conditions, except history of depression or anxiety.	0 (14%) I (35%) II (48%) IIIA (3%)	CT: 59% RT: 69%	~1.5 (0.15)	Convenience sample 18 healthy controls 'demographically matched' (method of matching not reported).	STAI (state anxiety)	STAI mean score (SD): CT: 27.6 (8.8) No CT: 28.3 (11.3)	STAI mean score (SD): 25.6 (7.2)	-	P>0.05	-
							Prevalence of anxiety: 7%	Prevalence of anxiety: 0%	PR= 1.25 †	95%CI: 0.12-12.65	Cut off for case: STAI-S T-score ≥65
Klein et al., 2011 [20] France	Population based 652 breast cancer survivors >5 post active-treatment, randomly selected from 3 population-based cancer registries by year of diagnosis.	0-IV (ND)	Srg, C: 64.7% Srg, M: 34.6% CT: 45.8% RT: 83.0% HT: 68.0%	Diagnosed in: 2000: 5.6 (1.0), 5.0-5.9 1995: 10.3 (0.6), 10.0-10.9 1990: 15.6 (1.0), 15.0-15.9	Population based 1,188 women with no history of cancer randomly selected from the electoral rolls; individually matched by age (±10 years) and place of residence (area of the cancer registry, and urban/rural).	STAI (state anxiety)	STAI mean score (SD): Diagnosed in: 2000: 34.4 (ND) 1995: 34.7 (ND) 1990: 33.2 (ND)	STAI mean score (SD): 28.5 (ND)	-	P<0.001 *	Higher STAI scores indicate more anxiety symptoms. Mean scores adjusted for age group, marital status, education, employment status, household monthly income comorbidities and hospitalization in the last 12 months.
Saleeba et al., 1996 [21] ‡ United States	52 women aged <70 years, education ≥6th grade, no history of psychiatric diagnoses, >5 years disease-free, selected from those under long-term follow up of breast cancer.	I (13%) II (63%) III (23%)	Srg, C: 0% Srg, M: 100%	8.5 (ND), 5-18	88 women aged <70 years, with ≥6th grade of education, no history of psychiatric diagnoses and undergoing routine low risk breast cancer screening.	STAI (mild to moderate state anxiety)	Prevalence: 21%	Prevalence: 7%	PR=3.0 * †	95%CI: 1.19-7.57	Cases defined as state anxiety scores above the 85th percentile for respective age group.
						STAI (state anxiety)	STAI mean score (SD): 33.08 (11.50)	STAI mean score (SD): 31.82 (8.40)	-	P>0.05	Higher STAI scores indicate more anxiety symptoms.

ATC = Anatomic Therapeutic Chemical classification system; BSI-18 = Brief Symptom Inventory 18 [22]; CT = chemotherapy; EHR = electronic health records; HADS = Hospital Anxiety and Depression Scale [23]; HRS-A = Hamilton Rating Scale for Anxiety [24]; HSCL-25 = The Hopkins Symptom Checklist-25 [25]; HT = hormone therapy; ICD-8 = The International Classification of Diseases, Eight Revision; ICD-9-CM = The International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10 = The International

Statistical Classification of Diseases and Related Health Problems, Tenth Revision; IQR = interquartile range; ISRA = Inventory of Situations and Responses to Anxiety [26]; IT = immunotherapy; ND = not defined; OR = odds ratio; PR = prevalence ratio; RR = relative risk; RT = radiotherapy; SCL-90 = Anxiety subscale of the Symptoms Checklist-90 [27]; SD = standard deviation; SIR = standardised incidence ratio; Srg, C = Breast conserving surgery; Srg, ND = Surgery, not further specified; Srg, M = Mastectomy; Srg, R = Breast reconstructive surgery; STAI = State-Trait Anxiety Inventory [28]; yrs = years; 95%CI = 95% confidence interval.

* There was some statistical evidence ($P<0.05$) for a different prevalence, risk or severity of anxiety between breast cancer survivors and women who did not have cancer.

† Prevalence ratio calculated by the authors of the present study.

‡ The two studies provided results for different components of anxiety (trait and state) based on the same sample of patients.

Supplementary Table 4. Depression: main characteristics and results of the studies that evaluated the risk of depression, or the prevalence or severity of depressive symptoms, in breast cancer survivors (>1 year) and women who did not have cancer.

First author, year of publication Country	Breast cancer survivors				Comparison group	Outcome assessment	Quantitative measure of the outcome		Relative risk estimate (RR, OR, SIR, PR)	P-value or 95% confidence interval	Notes
	Type of population and main characteristics	Stage at diagnosis (%)	Breast cancer treatments (%)	Time since diagnosis/ treatment in years: mean/ median (SD), range	Type of population and main characteristics		Breast cancer survivors	Comparison group			
Electronic health records											
Suppli et al., 2014 [29] Denmark (continues)	Population-based All 44,494 women born in 1920-1981 and living in Denmark, who had breast cancer diagnosed in 1998-2011, without history of other cancers or major psychiatric disorder.	All	ND	5 (ND), 0-15	Population-based 1,997,669 women born in 1920-1981 and living in Denmark, without history of cancer or major psychiatric disorder	EHR, first hospital contact (in- or outpatient) for unipolar depression, as registered in the Danish Psychiatric Central Registry. ICD-8 codes: 296.09, 296.29; ICD-10 codes: F32-33.9	Incidence rate: 215 per 100,000 person-years Cumulative incidence: 1.1%	Incidence rate: 171 per 100,000 person-years Cumulative incidence: 0.8%	All patients: RR= 1.39 *	All patients: 95%CI: 1.27-1.52	Includes patients diagnosed with breast cancer at <1yr.
									By age: 30-39: RR= 0.78 40-49: RR= 1.56 * 50-59: RR= 1.35 * 60-69: RR= 1.41 * 70-79: RR= 1.25 * ≥80: RR= 1.56 *	By age: 95%CI: 0.39-1.55 95%CI: 1.23-1.96 95%CI: 1.11-1.63 95%CI: 1.16-1.71 95%CI: 1.03-1.51 95%CI: 1.25-1.93	RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011) and Charlson comorbidity index score (0, 1, ≥2).
									By Charlson comorbidity index: 0: RR= 1.47 * 1: RR= 1.41 * ≥2: RR= 1.02	By Charlson comorbidity index: 95%CI: 1.31-1.64 95%CI: 1.18-1.69 95%CI: 0.77-1.34	RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011).
							Cumulative incidence:	Cumulative incidence:			RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011) and Charlson comorbidity index score (0, 1, ≥2). Significant predictors of depression among breast cancer survivors: Age at diagnosis and living alone.
				0-1			0.3%	0.2%	RR= 1.70 *	95%CI: 1.41-2.05	
				1-2			0.2%	0.2%	RR= 1.48 *	95%CI: 1.19-1.83	
				2-3			0.3%	0.2%	RR= 1.64 *	95%CI: 1.31-2.06	
				3-4			0.2%	0.2%	RR= 1.20	95%CI: 0.90-1.60	
				4-5			0.2%	0.2%	RR= 1.40 *	95%CI: 1.04-1.87	
				6-8			0.2%	0.2%	RR= 1.13	95%CI: 0.90-1.41	
				9-14			0.2%	0.1%	RR= 1.09	95%CI: 0.80-1.46	
	Population-based All 35,286 women born in 1920-1981 and living in Denmark, who had breast cancer diagnosed in 1998-2011 and did not use antidepressants in the 3 years before study entry, without history of other cancers or major psychiatric disorder.	All	ND	5 (ND), 0-15	Population based 1,860,552 women born in 1920-1981 and living in Denmark, without history of cancer or major psychiatric disorder and who did not use antidepressants during the three years prior to study entry.	EHR, first redeemed prescription of antidepressants (group N06A of the ATC classification system)	Incidence rate: 3,772 per 100,000 person-years Cumulative incidence: 17.1%	Incidence rate: 1,971 per 100,000 person-years Cumulative incidence: 9.4%	RR= 1.82 *	95%CI: 1.77-1.86	RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011) and Charlson comorbidity index score (0, 1, ≥2). Predictors of depression among breast cancer survivors: age at diagnosis, living alone, not having higher education, having comorbidities, positive lymph node metastasis.

Suppli et al., 2014 [29] Denmark (continued)	Population-based All 35,286 women born in 1920-1981 and living in Denmark, who had breast cancer diagnosed in 1998-2011 and did not use antidepressants in the 3 years before study entry, without history of other cancers or major psychiatric disorder.	All	ND	5 (ND), 0-15	Population based 1,860,552 women born in 1920-1981 and living in Denmark, without history of cancer or major psychiatric disorder and who did not use antidepressants during the three years prior to study entry.	EHR, first redeemed prescription of antidepressants (group N06A of the ATC classification system)	Incidence rate: 3,772 per 100,000 person-years Cumulative incidence: 17.1%	Incidence rate: 1,971 per 100,000 person-years Cumulative incidence: 9.4%	By Charlson comorbidity index score: 0: RR= 2.06 * 1: RR= 1.49 * ≥2: RR= 1.25 * By age: 30-39: RR= 2.07 * 40-49: RR= 2.12 * 50-59: RR= 2.12 * 60-69: RR= 1.89 * 70-79: RR= 1.59 * ≥80: RR= 1.29 *	By Charlson comorbidity index score: 95%CI: 2.00-2.12 95%CI: 1.40-1.58 95%CI: 1.15-1.36 By age: 95%CI: 1.77-2.43 95%CI: 1.98-2.27 95%CI: 2.02-2.23 95%CI: 1.80-1.99 95%CI: 1.51-1.68 95%CI: 1.19-1.40	RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011). Includes patients diagnosed with breast cancer at <1yr. RR adjusted for age (5-year intervals), calendar period (1998-2000, 2001-2004, 2005-2008, 2009-2011) and Charlson comorbidity index score (0, 1, ≥2).
				5 (ND), 0-15			Cumulative incidence: 17%	Cumulative incidence: 9.4%	RR= 1.82 *	95%CI: 1.77-1.86	
				0-1			6.4%	2.1%	RR= 3.09 *	95%CI: 2.95-3.22	
				1-2			4.2%	2.1%	RR= 2.06 *	95%CI: 1.94-2.18	
				2-3			3.3%	2.1%	RR= 1.60 *	95%CI: 1.49-1.72	
				3-4			3.3%	2.1%	RR= 1.59 *	95%CI: 1.46-1.72	
				4-5			2.7%	2.1%	RR= 1.30 *	95%CI: 1.18-1.44	
				6-8			2.6%	2.1%	RR= 1.23 *	95%CI: 1.15-1.32	
				9-14			2.2%	2.0%	RR= 1.08	95%CI: 0.98-1.19	
Hjerl et al., 2002 [1] Denmark (continues)	Population-based All 60,431 women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993.	All	ND	4 (ND), 0-15 (Median cohort follow up: 4 years since diagnosis; range: 0 to 15)	Population-based Danish female population aged >15 years.	EHR, first ever psychiatric admission with affective disorders, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 296.19-296.99, 298.09, 301.19, 300.49	Cumulative incidence: 0.7%	Cumulative incidence: 0.5%	SIR= 1.49 * By calendar period: 1970-74: SIR=1.68 * 1975-79: SIR=1.60 * 1980-84: SIR=1.56 * 1985-89: SIR=1.46 * 1990-93: SIR=1.25	95%CI: 1.35-1.63 By calendar period: 95%CI: 1.20-2.27 95%CI: 1.30-1.94 95%CI: 1.28-1.88 95%CI: 1.19-1.77 95%CI: 0.99-1.55	Standardised incidence ratio estimated considering all follow up time since diagnosis.

Hjerl et al., 2002 [1] Denmark (continued)	Population-based All 60,431 women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993.	All	ND	4 (ND), 0-15 (Median cohort follow up: 4 years since diagnosis; range: 0 to 15)	Population-based Danish female population aged >15 years.	EHR, first ever psychiatric admission with affective disorders, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 296.19-296.99, 298.09, 301.19, 300.49	-	-	By age group: 15-29: SIR= 3.24 30-34: SIR= 0.67 35-39: SIR= 1.96 40-44: SIR= 2.92 * 45-49: SIR= 1.46 * 50-54: SIR= 2.14 * 55-59: SIR= 1.39 * 60-64: SIR= 1.46 * 65-69: SIR= 1.32 70-74: SIR= 1.22 75-79: SIR= 1.09 80-84: SIR= 1.00 85-89: SIR= 1.28 ≥90: SIR= 2.43	By age group: 95%CI: 0.19-14.3 95%CI: 0.04-2.94 95%CI: 0.98-3.44 95%CI: 2.06-4.00 95%CI: 1.03-2.00 95%CI: 1.69-2.67 95%CI: 1.05-1.81 95%CI: 1.11-1.89 95%CI: 0.99-1.73 95%CI: 0.90-1.61 95%CI: 0.75-1.51 95%CI: 0.60-1.53 95%CI: 0.59-2.39 95%CI: 0.60-6.30	Standardised incidence ratio estimated considering all follow up time since diagnosis.
	Women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993 and living in Copenhagen city area (metropolitan).	All	ND	4 (ND), 0-15	Female population aged >15 years and living in Copenhagen city area.	EHR, first ever psychiatric admission with affective disorders, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 296.19-296.99, 298.09, 301.19, 300.49	-	-	SIR= 1.19	95%CI: 0.95-1.48	Standardised incidence ratio estimated considering all follow up time since diagnosis.
				1.5			-	-	SIR= 0.9	95%CI: 0.5-1.7	Approximate values estimated from the graphics provided in the original study.
				2.5			-	-	SIR= 1.2	95%CI: 0.6-2.0	
				3.5			-	-	SIR= 0.9	95%CI: 0.4-1.9	
				4.5			-	-	SIR= 1.1	95%CI: 0.4-2.3	
				5.5			-	-	SIR= 1.7	95%CI: 0.7-3.1	
				6.5			-	-	SIR= 1.3	95%CI: 0.4-2.8	
				7.5			-	-	SIR= 0.6	95%CI: 0.1-1.9	
				8.5			-	-	SIR= 0.7	95%CI: 0.1-2.2	
				9.5			-	-	SIR= 0.4	95%CI: 0.0-1.9	
				10.5			-	-	SIR= 2.5	95%CI: 0.9-5.4	
				13.0			-	-	SIR= 0.2 *	95%CI: 0.0-0.9	
	Women aged >15 years with first invasive breast cancer registered in the national Cancer Registry in 1970-1993 and living outside Copenhagen city area.	All	ND	4 (ND), 0-15	Female population aged >15 years and living outside Copenhagen city area.	EHR, first ever psychiatric admission with affective disorders, as registered in the Danish Psychiatric Central Registry ICD-8 codes: 296.19-296.99, 298.09, 301.19, 300.49	-	-	SIR= 1.57 *	95%CI: 1.41-1.75	Standardised incidence ratio estimated considering all follow up time since diagnosis. Approximate values estimated from the graphics provided in the original study.
				1.5			-	-	SIR= 2.1 *	95%CI: 1.6-2.6	
				2.5			-	-	SIR= 1.3	95%CI: 0.9-1.8	
				3.5			-	-	SIR= 1.5 *	95%CI: 1.1-2.1	
				4.5			-	-	SIR= 1.4	95%CI: 0.9-2.0	
				5.5			-	-	SIR= 1.6 *	95%CI: 1.1-2.4	
				6.5			-	-	SIR= 1.4	95%CI: 0.8-1.9	
				7.5			-	-	SIR= 1.1	95%CI: 0.6-1.8	
				8.5			-	-	SIR= 1.0	95%CI: 0.5-1.8	
				9.5			-	-	SIR= 0.8	95%CI: 0.3-1.6	
				10.5			-	-	SIR= 0.9	95%CI: 0.4-1.8	
				11.5			-	-	SIR= 0.9	95%CI: 0.3-1.9	
				12.5			-	-	SIR= 1.1	95%CI: 0.4-2.3	
				13.5			-	-	SIR= 1.6	95%CI: 0.6-3.1	

Hung et al., 2013 [2] Taiwan	Population-based 26,629 women with no prior mood disorder and cancer, with breast cancer registered in the National Health Insurance Database in 2000-2005.	All	ND	2.7 (ND), ND-7 (median follow up years for breast cancer survivors: 2.7; for matched cohort: 3.21)	Population-based 26,629 women randomly selected from 1 million women who did not have breast cancer registered in the National Health Insurance Database; matched for age and Charlson comorbidity score (matching, categories not reported).	EHR, recorded in the Registry for Catastrophic Illness with an ICD-9-CM code for major depressive disorder (296.2X-296.3X, 300.4, 311.X)	Incidence rate: 14.55 per 1,000 person-years Cumulative incidence= 4.4%	Incidence rate: 7.51 per 1,000 person-years Cumulative incidence= 2.6%	RR=1.94 *	95%CI: 1.76-2.13	Includes patients diagnosed with breast cancer at <1yr.
				2			4%	2%	RR=2.0 * †	95%CI: 1.80-2.22	Approximate cumulative incidence values estimated from the graphics provided in the original study.
				4			5%	3%	RR=1.7 * †	95%CI: 1.53-1.82	
				6			6%	4%	RR=1.5 * †	95%CI: 1.39-1.62	P value for the log-rank test comparing the Kaplan-Meier curves: P<0.001
Earle et al., 2007 [30] United States	Convenience sample 463 women who had non-metastatic cancer registered with a private health care insurance company and not receiving active treatment; patients had no evidence of recurrence.	Non-metastatic	ND	ND (ND), ≥5	Convenience sample 3,108 women without cancer registered with a private health care insure company; matched for age and clinic location (individual matching, categories not reported).	EHR, ICD-9 codes for diagnoses of psychotic depression and dysthymia in an administrative database from a health care plan.	Prevalence: 22.5%	Prevalence: 18.1%	PR=1.24 * †	95%CI: 1.03-1.50 P=0.04	Breast cancer survivors had more visits with mental health providers compared to women without cancer.
Kim et al., 2017 [31] Korea	Population based 2,130 women who had mastectomy for breast cancer, randomly selected from the National Health Insurance Database	All	Srg, M: 100%	0	Population based 8,520 women never diagnosed with cancer randomly selected from the same database as the cases matched for age, income, region, pre-operative depression (individual matching, categories not reported).	EHR, ICD-10 codes for depression	Prevalence: 5.5%	Prevalence: 2.5%	PR= 2.20 * †	95%CI: 1.76-2.74	-
				1			4.8%	3.1%	PR= 1.55 * †	95%CI: 1.24-1.94	
				2			4.4%	3.0%	PR= 1.47 * †	95%CI: 1.14-1.89	
				3			4.4%	3.1%	PR= 1.42 * †	95%CI: 1.08-1.87	
				4			4.1%	4.0%	PR= 1.03 †	95%CI: 0.76-1.39	
				5			4.4%	3.5%	PR= 1.26 †	95%CI: 0.91-1.75	
				6			4.5%	4.3%	PR= 1.05 †	95%CI: 0.73-1.49	
				7			5.0%	3.9%	PR= 1.28 †	95%CI: 0.86-1.91	
				8			6.0%	3.9%	PR= 1.54 †	95%CI: 0.99-2.39	
				9			5.4%	4.7%	PR= 1.15 †	95%CI: 0.67-1.98	
				10			8.1%	4.5%	PR= 1.80 †	95%CI: 0.93-3.47	

Yang et al., 2017 [4] Sweden	Population based All 4,402 women diagnosed with an in situ breast cancer at the age of 20-80 years between 2001-2009	0	ND	4.7 (4.4), 0-10 (median (IQR) duration of follow up: 4.7 (4.4))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for depression (F32-F33) at in patient or outpatient hospital visits	Cumulative incidence: 1.3%	Cumulative incidence: 1.2%	SIR= 1.03	95%CI: 0.80-1.34	Standardised incidence ratios were standardised by calendar period (1-year categories), age (5-year categories), and region of residence (North, Stockholm- Gotland, South, Southeast, Uppsala-Orebro, West).
									By age group: 20-44: SIR= 1.48 45-54: SIR= 0.84 55-64: SIR= 1.01 65-80: SIR= 1.07	By age group: 95%CI: 0.84-2.61 95%CI: 0.51-1.36 95%CI: 0.61-1.68 95%CI: 0.62-1.85	
				0-0.5			0.1%	0.1%	SIR= 0.77	95%CI: 0.29-2.05	
				0.5-1			0.1%	0.1%	SIR= 1.14	95%CI: 0.51-2.54	
				1-2			0.2%	0.2%	SIR= 0.91	95%CI: 0.47-1.74	
				2-5			0.6%	0.5%	SIR= 1.15	95%CI: 0.78-1.70	
				5-10			0.3%	0.3%	SIR= 1.00	95%CI: 0.57-1.76	
				4.7 (4.4), 0-10 (median (IQR) duration of follow up: 4.7 (4.4))		EHR, being prescribed an antidepressant (group N06A of the ATC classification system)	Cumulative incidence: 3.6%	Cumulative incidence: 2.3%	SIR= 1.58 *	95%CI: 1.36-1.85	Standardised incidence ratios were standardised by calendar period (1-year categories), age (5-year categories), and region of residence (North, Stockholm- Gotland, South, Southeast, Uppsala-Orebro, West).
									By age group: 20-44: SIR= 1.36 45-54: SIR= 1.93 * 55-64: SIR= 1.54 * 65-80: SIR= 1.40 *	By age group: 95%CI: 0.84-2.23 95%CI: 1.48-2.53 95%CI: 1.15-2.07 95%CI: 1.05-1.87	
				0-0.5			-	-	SIR= 2.09	95%CI: 1.57-2.79	
				0.5-1			-	-	SIR= 1.49	95%CI: 1.04-2.13	
				1-2			-	-	SIR= 1.70	95%CI: 1.30-2.22	
				2-4.5			-	-	SIR= 1.12	95%CI: 0.79-1.59	
	Population based All 40,849 women diagnosed with an invasive breast cancer at the age of 20-80 years between 2001-2009	I-IV	ND	4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for depression (F32-F33) at in patient or outpatient hospital visits	Cumulative incidence: 1.9%	Cumulative incidence: 1.2%	SIR= 1.57 *	95%CI: 1.46-1.69	SIR standardised by calendar period, age, and region. Predictors of depression among breast cancer survivors: having comorbidities and positive lymph nodes.
									By age group: 20-44: SIR= 1.69 45-54: SIR= 1.70 55-64: SIR= 1.56 65-80: SIR= 1.38	By age group: 95%CI: 1.42-2.01 95%CI: 1.50-1.93 95%CI: 1.36-1.79 95%CI: 1.19-1.59	
				0-0.5			0.2%	0.1%	SIR= 1.83 *	95%CI: 1.48-2.26	
				0.5-1			0.3%	0.1%	SIR= 2.48 *	95%CI: 2.07-2.97	
				1-2			0.4%	0.2%	SIR= 2.04 *	95%CI: 1.76-2.36	
				2-5			0.6%	0.5%	SIR= 1.29 *	95%CI: 1.14-1.46	
				5-10			0.3%	0.3%	SIR= 1.18	95%CI: 0.99-1.41	
				4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))		EHR, being prescribed an antidepressant (group N06A of the ATC classification system)	Cumulative incidence: 9.2%	Cumulative incidence: 2.2%	SIR= 1.95 *	95%CI: 1.86-2.04	SIR standardised by calendar period, age, and region.
									By age group: 20-44: SIR= 2.43 * 45-54: SIR= 2.23 * 55-64: SIR= 2.00 * 65-80: SIR= 1.64 *	By age group: 95%CI: 2.14-2.76 95%CI: 2.02-2.45 95%CI: 1.83-2.18 95%CI: 1.51-1.77	
				0-0.5			-	-	SIR= 2.14 *	95%CI: 1.95-2.36	
				0.5-1			-	-	SIR= 2.62 *	95%CI: 2.40-2.87	
				1-2			-	-	SIR= 1.92 *	95%CI: 1.76-2.09	
				2-4.5			-	-	SIR= 1.34 *	95%CI: 1.20-1.49	

Khan et al., 2010 [3] United Kingdom	Population-based 16,938 women aged ≥30 with breast cancer registered in the UK General Practice Research Database.	All	ND	ND (ND), ≥5	Population-based 67,649 women who did not have breast or colorectal cancer at beginning of follow; individual matching for age (± 1 year) and primary care practice (small area).	EHR, primary care consultations for depression recorded with Read codes	Prevalence: 9.6%	Prevalence: 8.9%	OR= 1.06	95%CI: 1.00-1.14	Odds ratio adjusted for Charlson comorbidity score, previous history of depression and death.
						EHR, ≥1 prescription of antidepressants	Prevalence: 23.7%	Prevalence: 20.2%	OR= 1.16 *	95%CI: 1.11-1.22	Odds ratio adjusted for Charlson comorbidity score, number of consultations, and death.
Cohort studies involving scales											
Aerts et al., 2014 [32] ND	Convenience sample 66 women who had breast-conserving surgery for early breast cancer and no recurrence during follow up.	'Early-stage' (100%)	Srg, C: 100% CT: 24.7% RT: 76.5% HT: 70.3%	~ 1 (follow up at 1 year)	Convenience sample 149 women with no history of cancer recruited in: a gynaecology outpatient clinic, an organisation for elderly women and online; matched for age (method not reported).	BDI	BDI mean score (SD) 7.71 (8.00)	BDI mean score (SD) 5.28 (5.34)	-	P=0.02 *	Higher CES-D scores indicate more depressive symptoms. Women who had advanced stage or had had relapse were excluded at baseline, as were those who had recurrence or a second cancer during follow up.
	Convenience sample 48 women who had mastectomy for early breast cancer at one university hospital and no recurrence during follow up.	'Early-stage' (100%)	Srg, M: 100% CT: 44.1% RT: 45.6% HT: 54.4%	~ 1 (follow up at 1 year)			BDI mean score (SD) 8.85 (6.79)	BDI mean score (SD) 5.28 (5.34)	-	P<0.01 *	
Ancoli-Israel et al., 2014 [33] United States	Convenience sample 44 women who had been diagnosed with breast cancer 1 year before, and scheduled to receive ≥4 cycles of CT, with no psychological impairments and not receiving RT at recruitment.	I (27.9%) II (39.7%) III (30.9%) Unknown (1.5%)	Srg, C: 45.6% Srg, M: 49.7% CT: 100%	~ 1 (follow up at 1 year after CT)	Convenience sample 35 cancer-free friends of the women who had breast cancer with no psychological impairments at the time of recruitment; individual matching for age (±5 years), ethnicity and education (categories of ethnicity and education not reported).	CES-D	CES-D mean score (SD) 10.0 (ND)	CES-D mean score (SD) 4.8 (ND)	-	P=0.04 *	Higher CES-D scores indicate more depressive symptoms. Mean scores adjusted for age and body mass index.

Kesler et al., 2013 [34] United States	Convenience sample 44 women who had breast cancer recruited via support groups and advertisements; patients excluded if they had had disease recurrence or relapse.	I-IIIA	Srg, ND: 100% CT: 100%	4.8 (3.4), 1-12	Convenience sample 38 healthy female controls recruited through advertisements	CAD	CAD mean score (SD): 48.8 (8.2)	CAD mean score (SD): 48.0 (7.2)	-	P=0.08	-
Bailey et al., 2010 [35] United States	Convenience sample 515 patients with first primary breast cancer, aged >40 years, with no cognitive impairment or prior history of breast cancer, post active treatment and who spoke English.	0 (34.4%) I (51.4%) IIA (14.2%)	Srg, ND: 100%	~ 1 (follow up at 12 months after surgery)	Convenience sample 496 women who had a normal/benign mammogram, aged >40 years, with no cognitive impairment or prior history of breast cancer, and who spoke English; frequency matched for age (40-50, 50-69, ≥70 years).	CES-D Cut-off score for case: ≥16	Prevalence: 47.4%	Prevalence: 52.6%	PR= 0.9 †	95%CI: 0.80-1.02	Women with more advanced disease at diagnosis (stage IIA) had significantly more depression compared to those diagnosed at earlier stages.
Hermelink et al., 2017 [36] Germany	Convenience sample 56 women aged 18-65 years, newly diagnosed with breast cancer, with no previous history of neurological or psychotic disorders and no previous systemic treatment for cancer	0 (7%) I (42%) II (41.4%) III (%9.6)	CT: 100% HT: 73.9% vs. CT: 0% HT: 80.7%	~ 1 (follow up at 1 year after diagnosis)	Convenience sample 150 women aged 18-65 years, who never had cancer, and attended the same institution as cases for breast imagining and did not require further tests.	PHQ-D	PHQ-D mean score CT: 4.7 (4.5) No CT: 4.2 (4.5)	PHQ-D mean score 2.7 (3.0)	-	P=0.03 * (for differences between the three groups)	Higher PHQ-D mean scores indicate more depressive symptoms.
Lee et al., 2011 [37] Korea	Convenience sample 206 patients aged ≥18 years who had been diagnosed with breast cancer 1 year before	I-IIA (71.2%) IIB-III (25.0%)	Srg, C: 82.5% Srg, M: 16.4% CT: 86.7% RT: 82.5% HT: 82.2%	~ 1 (follow up at 1 year after diagnosis)	Population-based Nationally representative sample of 496 adult women.	SDS	SDS mean score 38.1 (0.94)	SDS mean score 38.8 (0.37)		P=0.514	Mean scores adjusted for age, menopausal status, comorbidity, marital status, educational level, religious practice, job status, monthly income, body mass index, smoking status, drinking status, regular exercise, propensity score, and subscales of social support.
							Prevalence: 49.3%	Prevalence: 46.6%	PR=1.06 †	95%CI: 0.89-1.25 P=0.516	Cut-off score for case: ≥50

Cross-sectional studies involving scales											
Bizetti Pelai et al., 2012 [38]	Convenience sample 89 women who had surgery for breast cancer at <10 years	ND (ND)	Srg, BCS: 37% Srg, M: 50-63% RT: 2-11% CT: 24-30% CT+RT: 54-60%	3.7 (ND), ≤10	Convenience sample 43 women without breast cancer, or neurological or orthopaedic impairments of the upper limbs	BDI	Prevalence: 41.6%	Prevalence: 28.0%	PR=1.49 †	95%CI: 0.97-2.28	Cut-off score for case: ≥10
Castellon et al., 2004 [15] United States	Convenience sample 53 women who had breast cancer at or before the age of 50, with no evidence of disease or recurrence, and no history of psychiatric disorder.	0-II (100%)	CT: 34% CT+HT: 34%	ND (ND), 2-5	Convenience sample 19 Healthy women recruited via fliers, newsletter articles and advertisements, or amongst the acquaintances of the hospital staff.	BDI	BDI mean score (SD): No CT: 7.0 (4.5) CT: 6.3 (5.1)	BDI mean score (SD): 7.8 (7.9)	-	P=0.63	-
Weitzner et al., 1997 [16] United States	Convenience sample 60 women with age <70 years, education ≥6th grade, no history of psychiatric diagnoses, >5 years disease-free, selected from those returning to the hospital for long-term follow up of cancer.	I (15%) II (63%) III (22%)	Srg, M: 100%	ND (ND), ≥5	Convenience sample 93 employees or volunteer workers at the same hospital with no personal or family history of breast cancer, age <70 years, education ≥6th grade, and no psychiatric history.	BDI Scale applied as part of a psychiatric interview	BDI mean score (SD): 7 (ND)	BDI mean score (SD): 5 (ND)	-	P<0.003 *	Adjusted for years of age and years of education. Among breast cancer survivors, lower BDI scores, indicating less depression, were associated with better quality of life for all domains (P<0.02), except in the family one.
							Prevalence: 29%	Prevalence: 15%	PR= 1.93 * †	95%CI: 1.03-3.61	Cut-off score for case: >12 (mild to moderate depression)
Garcia-Torres et al., 2013 [14] Spain	Convenience sample 22 breast cancer survivors free of relapse identified by staff of the local association against cancer.	ND	Srg, M: 100% CT: 72.7%	8.2 (5.6), 1-21	Convenience sample 22 women with no history of cancer who volunteered with the same association against cancer.	BDI-II	BDI-II mean score (SD): 13.13 (7.83)	BDI-II mean score (SD): 8.18 (7.78)	-	P=0.02 *	Correlation between anxiety and depression: r = 0.46, p<0.05; Cut-off score for case: >14 (slight to severe depression)
							Cognitive-affective component: 5.86 (4.06)	Cognitive-affective component: 3.72 (3.88)	-	P=0.03 *	
							Motivational-somatic component: 6.81 (5.07)	Motivational-somatic component: 3.81 (2.92)		P=0.02 *	
							Prevalence: 40%	Prevalence: 18%	PR= 2.22 †	95%CI: 0.79-6.21	

Nguyen et al., 2013 [39] United States	Convenience sample 57 women survivors of breast cancer, aged over 65 years, without recurrence, recruited from a cancer registry	I-IIIA (100%)	RT: 53% CT: 47%	>10	Convenience sample 30 healthy female adults, selected in the community for a previous study.	BDI-II	BDI-II mean score (SD): 4.86 (4.07)	BDI-II mean score (SD): 4.03 (3.38)	-	P=0.39	-
Cohen et al., 2011 [5] Israel	Convenience sample 56 married Israeli Arab breast cancer survivors, post treatment and free of disease recruited from one hospital.	I-III (ND%)	Srg, C: 48.2% Srg, M: 51.8% Srg, R: 12.5% CT: 85.7% RT: 85.7% HT: 58.9%	4.8 (4.2), 1-17	Convenience sample 66 married and healthy Arab women living in Israel, approached in community settings; individual matching for age and education (matching categories not reported).	BSI-18	BSI-18 mean score (SD): 2.0 (1.1)	BSI-18 mean score (SD): 1.8 (0.8)	-	P>0.05	Higher levels of depression associated with higher levels of anxiety and somatization, and lower levels of support in both groups (P<0.05). Higher levels of depression associated with lower body image in breast cancer survivors (P=0.05).
Broeckel et al., 2002 [40] United States	Convenience sample 58 breast cancer survivors who had a spouse or partner, free of recurrence for >5 years, with no known neurological disorder, and no history of other cancer.	I (26%) II (62%) III (10%) Unknown (2%)	Srg, C: 50% Srg, M: 47% CT: 100% RT: 71% HT: 48%	7.7 (2.3), 5.2-15.2	Convenience sample 61 women with no history of cancer who had a spouse or partner, recruited among the friends of the women who had breast cancer; individual matching for age (± 6 years).	CES-D	CES-D mean score (SD): 8.01 (6.34)	CES-D mean score (SD): 4.75 (4.12)	-	P≤0.05 *	Higher CES-D score indicates more depressive symptoms. Correlation between depression scores and problems in sexual function: r = 0.27, P≤0.05
Claus et al., 2006 [41] United States	Population-based All 795 women diagnosed with DCIS in 1994-1998, with no history of invasive breast cancer; reinterviewed on average 6.2 years after first interview.	0 (100%)	Srg, C: 35.5% Srg, M: 14.0%	5.8 (1.0), ND	Population based 702 women selected by random-digit-dialling methods, with no history of DCIS or invasive breast cancer; frequency matched for age (± 5 years) and geography. Reinterviewed on average at 6.0 (0.6) years after first interview.	CES-D	CES-D mean score (95%CI): 8.3 (7.7-8.9)	CES-D mean score (95%CI): 7.2 (6.6-7.8)	-	P<0.05 *	Higher CES-D score indicates more depressive symptoms. Mean scores adjusted for age at diagnosis/interview, race (white/non-white), education (college degree/no college) menopausal status, comorbid conditions (myocardial infarction, stroke, cancer), marital status (married/living as married vs. not), time since diagnosis and case/control status.
			Srg, C: 100%	5.7 (1.1)			CES-D mean score (SD): 8.1 (7.2-9.0)	CES-D mean score (SD): 7.2 (6.6-7.8)	-	P>0.05	
			Srg, C: 100% RT: 100%	5.7 (1.1)			CES-D mean score (SD): 8.7 (7.9-9.5)	CES-D mean score (SD): 7.2 (6.6-7.8)	-	P<0.05 *	
			Srg, M: 100%	6.0 (0.9)			CES-D mean score (SD): 7.4 (5.8-8.9)	CES-D mean score (SD): 7.2 (6.6-7.8)	-	P>0.05	

Conroy et al., 2013 [18]	Convenience sample 24 breast cancer survivors with history of non-metastatic disease and CT treated.	I (29%) IIa (33%) IIb (25%) IIIa (8%) IIIb (4%)	CT: 100% RT: 79%	6.4 (2.1), 3.2-10.2	Convenience sample 23 healthy women matched for age and education (matching method not reported).	CES-D	CES-D mean score (SD): 7.5 (5.8)	CES-D mean score (SD): 8.7 (6.9)	-	P>0.05	Higher CES-D score indicates more depressive symptoms.
Koppelmans et al., 2012 [42] The Netherlands	Convenience sample 196 women who had been treated for breast cancer between 1976 and 1995, were aged between 50 and 80 years in 2008, did not have recurrence or a second primary cancer and never used adjuvant hormone therapy.	I-III (100%)	HT: 0% CT: 100%	21 (4.4), ND	Convenience sample All 1,509 women without a history of cancer who were between 50 and 80 years of age at the time of the assessments, selected from a larger population-based cohort.	CES-D	CES-D mean score (SD): 4.7 (8.0)	CES-D mean score (SD): 6.7 (8.4)	-	P<0.05 *	Mean score adjusted for age (format of the variable not reported). Higher CES-D score indicates more depressive symptoms.
McDonald et al., 2010 [19] ND	Convenience sample 29 female breast cancer patients without neurobehavioral risk factors including neurologic, medical, or psychiatric conditions, except history of depression or anxiety	0 (14%) I (35%) II (48%) IIIA (3%)	CT: 59% RT: 69%	~1.5 (0.15)	Convenience sample 18 healthy controls 'demographically matched' (matching method not reported).	CES-D	CES-D mean score (SD): CT: 6.8 (6.2) No CT: 7.5 (10.4)	CES-D mean score (SD): 4.7 (8.9)	-	P>0.05	Higher CES-D score indicates more depressive symptoms.
							Prevalence of depression: 13.8%	Prevalence of depression: 5.6%	PR= 2.46 †	95%CI: 0.30 - 20.20	Cut-off for case: CES-D score ≥16
Otte et al., 2010 [43] United States	Convenience sample 246 breast cancer survivors free of cancer at recruitment, with no history of other cancers and able to speak, read and write English	I (ND) II (ND) III (ND)	Srg, C: 42% Srg, M: 59% CT: 89% RT: ND HT: 33%	5.6 (2.0), 2-10	Convenience sample 246 women in general good health with no history of breast cancer recruited by acquaintance referral, self-referral or from corporative group; individual matching for age (±5 years).	CES-D	CES-D mean score (SD): 11.53 (9.60)	CES-D mean score (SD): 9.00 (9.20)	-	P<0.01 *	Higher CES-D score indicates more depressive symptoms. Depressive scores were correlated with sleep-wake disturbances (p<0.05).

Root et al., 2015 [17]	Convenience sample 113 women aged <70 years who had breast cancer, were post-menopausal at diagnosis, receiving HT at recruitment, with no recurrence, no neurological or psychiatric diagnoses and who did not report sleep disturbances.	I (58%) II (0%) III (33%) IV (8%)	Srg, C: 75% Srg, M: 32% CT: 52% RT: 78% HT: 52%	4.2 (1.2)	Convenience sample 37 health women with no history of cancer or cancer treatment, post-menopausal, with no neurological or psychiatric diagnoses, matched for age and education (matching method not reported).	CES-D	CES-D mean score (SD): 8.6 (8.2)	CES-D mean score (SD): 7.8 (6.5)	-	P=0.59	Higher CES-D score indicates more depressive symptoms.
Von Ah et al., 2009 [44] United States	Convenience sample 52 women aged ≥40 years, who had breast cancer and had completed primary treatment ≥1 year ago, no cancer relapse, no metastatic disease or other cancer, and no history of psychiatric illnesses, recruited from cancer support groups, advertisements in churches and community centres, or by referral of enrolled participants.	I-II (50%) III (ND)	Srg, C: 66% Srg, M: 33% CT: 55.8% RT: 80.8% HT: 79%	4.6 (2.8), 1.2-15.8	Convenience sample 52 women aged ≥40 years, with no history of cancer, no history of psychiatric illnesses, recruited from cancer support groups, advertisements in churches and community centres, or by referral of enrolled participants; individual matching for age (±5 years) and education (±3 years).	CES-D	CES-D mean score (SD): 10.8 (8.1)	CES-D mean score (SD): 9.5 (8.2)	-	P=0.415	Higher CES-D score indicates more depressive symptoms.
Von Ah et al., 2012 [45] United States	Convenience sample 62 non-Hispanic African American women diagnosed with non-metastatic breast cancer and able to read and write English, recruited by medical record review and by self-referral.	I-IIB (85.7%) IIIB (14.3%)	Srg, C: 0% Srg, M: 60.3% CT & RT: 54.6% HT: ND	5.0 (2.7), 2-10	Convenience sample 78 African American women with no history of breast cancer, recruited through community advertisements and events.	CES-D	CES-D mean score (SD): 12.2 (11.7)	CES-D mean score (SD): 11.6 (11.0)	-	P=0.757	Higher CES-D score indicates more depressive symptoms. Mean scores adjusted for age, income, years of education and body mass index.

Frazzetto et al., 2012 [46] Italy	Convenience sample 32 women aged 66-75 years, with breast cancer recurrence ≥10 years after initial diagnosis, recruited in one hospital.	ND	ND	ND (ND), ≥10	Convenience sample 35 women in 'good health' previously recruited in a hospital for a study on health-related quality of life	GDS	Prevalence: 33.3%	Prevalence: 20.0%	PR= 1.67 †	95%CI: 0.73-3.80	Cut-off score for case: 10-19 (mild depression)
							Prevalence: 50.0%	Prevalence: 8.6%	PR= 5.81 * †	95%CI: 1.87-18.08	Cut-off score for case: 20-30 (severe depression)
							Prevalence: 83.3%	Prevalence: 28.6%	PR= 2.91 * †	95%CI: 1.69-5.03	Cut-off score for case: ≥10 (mild to severe depression)
Calvio et al., 2010 [7] United States	Convenience sample 122 breast cancer survivors ≥1 year post treatment, working full-time for ≥1 year, with computer and internet, recruited via advertisements and flyers.	I (36.9%) II (44.3%) III (17.2%)	Srg, ND: 96.7% CT: 82.8% RT: 73.0% HT: 45.9% IT: 13.1%	3.1 (2.4), 1-10	Convenience sample 113 women without a previous cancer diagnosis, working full-time for ≥1 year, with computer and Internet, recruited via advertisements and flyers.	HADS	HADS mean score (SD): 4.6 (3.3)	HADS mean score (SD): 3.2 (2.7)	-	P<0.001 *	Higher scores indicate more depressive symptoms. Mean scores adjusted for marital status (cohabitating with partner vs. single/not cohabitating), race (Caucasian vs. non-Caucasian), ethnicity (Hispanic vs. non-Hispanic), age (<40, 41-50, 51-65), income (0-39,000; 40-59,000; 60-79,000; 80-89,000; 80-99,000; ≥100,000), and menopausal status (currently going through, premenopausal, postmenopausal).
Boehmer et al., 2015 [6] ND	Convenience sample 85 lesbian or bisexual breast cancer survivors post-active treatment recruited via advertisements, flyers, etc. (3.5% of whom had had cancer recurrence)	I-III (100%)	ND	4.5 (ND), 1-10	Convenience sample 85 lesbian or bisexual women with no history of cancer, no prophylactic mastectomy or oophorectomy, and not using hormone therapy, recruited via flyers, advertisements, etc.; individual matching for age (± 3 years) and partner status (partnered vs. unpartnered).	Antidepressants intake (self-reported)	Prevalence: 34.1%	Prevalence: 21.2%	PR=1.61 †	95%CI: 0.97-2.67	Depression was more common in women taking any psychopharmacological medication, compared to those who did not (OR=2.29, 95%CI: 1.02 to 5.15), and less common in women with higher levels of physical activity (OR= 0.31, 95%CI: 0.11-0.84).
						HADS score ≥8	Prevalence: 15.3%	Prevalence: 12.9%	PR=1.19 †	95%CI: 0.56-2.50	

Dahl et al., 2011 [8] Norway	Convenience sample 337 tumor free breast cancer survivors treated with radiotherapy during 1998 and 2002 in one hospital.	II (ND) III (ND)	Srg, C: 24% Srg, M: 76% CT: 82% RT: 100% HT: 81%	3.9 (ND), 2.6-6.9	Convenience sample 1,685 women randomly selected from a population-based sample with no history of cancer and had complete data for questionnaires; individual matching for age (± 5 years).	HADS	HADS mean score (SD): 3.1 (3.3)	HADS mean score (SD): 3.7 (3.1)	-	P<0.001 *	Mean scores adjusted for level of education, on disability pension and menopausal status. Higher scores of HADS for depression were associated in univariate analysis with more insomnia symptoms in breast cancer survivors and in controls (P<0.05).
Miao et al., 2016 [9]	Convenience sample 23 patients with breast cancer who had been treated with chemotherapy at a local hospital	I-III (100%)	CT: 100%	3 (0.3),	Convenience sample 26 age matched healthy controls selected amongst patients relatives and local universities (matching method not reported).	HRS-D	Mean score (SD) 5.04 (1.19)	Mean score (SD) 4.88 (1.23)	-	P=0.650	Higher score indicates more anxiety symptoms
Rubino et al., 2007 [10] Italy	Convenience sample 33 consecutive patients who had had breast-reconstruction after mastectomy, in 2001-2002.	ND	Srg, M: 100% Srg, R: 100%	ND (ND), >1	Convenience sample 33 women, randomly selected amongst university staff.	HRS-D ‡ Score ≥8	Prevalence: 45.4%	Prevalence: 12.1%	PR=3.76 * †	95%CI: 1.39-10.14	A P-value of 0.02 was reported in the article, for the chi-square test of differences in depression between groups.
Boele et al., 2015 [11] The Netherlands	Convenience sample Post-menopausal breast cancer survivors with no psychiatric history, who did not receive CT, selected from medical records. 20 exposed to HT, 43 in the Srg+RT group.	ND	Srg, ND: 95% CT: 0% RT: 65% HT: 100% / 0%	Exposure to HT: 3.2 (1.9), 1.5-7; Unexposed to HT: 2.8 (0.3), 2.3-3.3.	Convenience sample 44 friends or family members of the women who had had breast cancer, with no history of breast cancer; matched for age and education (method of matching not reported).	HSCL-25	HSCL-25 mean score (SD): HT: 12.89 (8.40) No HT: 15.46 (15.82)	HSCL-25 mean score (SD): 11.92 (10.97)	-	P=0.43	Higher HSCL-25 score indicates more depressive symptoms. P-value adjusted for age and premorbid IQ.

Kreukels et al., 2008 [12] The Netherlands	Convenience sample 63 women who had non-metastatic breast cancer, with no history of psychiatric diseases.	I-III (100%)	CT: 100% HT: 40%	~ 1	Convenience sample 60 friends or family of the patients with the same age who never had cancer; matched for age (matching method not reported).	HSCL-25	HSCL-25 mean score (SD): 17.1 (13.6)	HSCL-25 mean score (SD): 9.6 (9.2)	-	P<0.001 *	Higher HSCL-25 score indicates more depressive symptoms.
Min et al., 2010 [47] Korea	Convenience sample 52 women who had breast cancer treated with mastectomy and followed up immediate reconstruction with latissimus dorsi myocutaneous flap, recruited in one cancer center (3% had disease recurrence).	0 (15.4%) I (40.4%) II (30.7%) III (13.5%) IV (0%)	Srg, M: 100% Srg, R: 100%	3.1 (1.3), ND	Convenience sample 104 'healthy female volunteers' matched for age (matching method not reported).	SDS	SDS mean score (SD): 48.5 (11.6)	SDS mean score (SD): 39.9 (9.1)	-	P<0.001 *	Mean SDS scores in breast cancer survivors were significantly higher in women who had neo adjuvant chemotherapy compared to those who did not.
Amir et al., 2002 [13] Israel	Convenience sample 39 women free of cancer symptoms for ≥3 years and not under active treatment, identified through two hospitals.	I (46%) II (46%) III (8%)	Srg, C: 20% Srg, M: 80% CT: 66% RT: 41% HT: 46%	6.5 (ND), ≥5	Convenience sample 39 women who did not experience any life-threatening disease; matched for age and education (matching method not reported).	SCL-90	SCL-90 mean score (SD): 0.99 (1.07)	SCL-90 mean score (SD): 0.66 (0.55)	-	P<0.001 *	Higher SCL-90 scores indicate more depressive symptoms. Women who had breast cancer and reported PTSD symptoms had more depressive symptoms than those who did not: 2.13 (1.22) vs. 0.75 (0.75), P<0.01.

ATC = Anatomic Therapeutic Chemical classification system; BC = breast cancer; BDI = Beck Depression Inventory [48]; BDI-II = Beck Depression Inventory-II [49]; BSI-18 = Brief Symptom Inventory-18 [22]; CAD = Clinical Assessment of Depression [50]; CES-D = The Center for Epidemiologic Studies, Depression Scale [51]; CT = chemotherapy; EHR = electronic health records; GDS = Geriatric Depression Scale [52]; HADS = Hospital Anxiety and Depression Scale [23]; HRS-D = Hamilton Rating Scale for Depression [53]; HSCL-25 = Hopkins Symptom Checklist-25 [25]; HT = hormone therapy; ICD-8 = The International Classification of Diseases, Eight Revision; ICD-9-CM = The International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10 = The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision; ND = not defined; OR = odds ratio; PHQ-D = Patient Health Questionnaire - Depression [54]; PR = prevalence ratio; RR = relative risk; RT = radiotherapy; SCL-90 = Depression subscale of Symptoms Checlist-90 [27]; SD = standard deviation; SDS = Zung's self-rating depression scale [55]; SIR = standardised incidence ratio; Srg, C = Breast conserving surgery; Srg, ND = Surgery, not further specified; Srg, M = Mastectomy; Srg, R = Breast reconstructive surgery; yrs = years.

* There was some statistical evidence (P<0.05) for a different prevalence, risk or severity of anxiety between breast cancer survivors and women who did not have cancer.

† Prevalence ratio calculated by the authors of the present study.

Supplementary Table 5. Neurocognitive dysfunction: main characteristics and results of the studies that evaluated the cognitive dysfunction or its domains in breast cancer survivors (>1 year) and women who did not have cancer.

First author, year of publication Country	Breast cancer survivors				Comparison group	Outcome assessment	Quantitative measure of the outcome		Relative risk estimate (RR, OR, SIR, PR)	P-value or 95% confidence interval	Notes
	Type of population and main characteristics	Stage at diagnosis (%)	Breast cancer treatments (%)	Time since diagnosis/ treatment in years: mean/median (SD), range	Type of population and main characteristics		Breast cancer survivors	Comparison group			
Cohort studies involving neurocognitive assessment batteries											
Ahles et al., 2010 [56] United States	Convenience sample 46 women, aged 18-70 years, newly diagnosed with breast cancer, without history of neurologic disorders or axis I psychiatric disorders, consecutively recruited from one centre.	0 (16.7%) I (47.0%) II (28.0%) IIIA (8.3%)	CT: 100%	~1.5 (follow up at 18 months after treatment)	Convenience sample 39 women without cancer recruited through community advertisements; frequency matched for age and education (categories of matching not reported).	Change in the standardised scores for processing speed since baseline assessment prior to CT. Processing speed: Digit Symbol-Coding (WAIS-III), Trail Making Test (D-KEFS), Color-Word Interference Test (D-KEFS), and Grooved Pegboard. Verbal ability: Vocabulary [WASI, Verbal Fluency Test (D-KEFS)]. Verbal memory: CVLT-II, Logical Memory I and II (WMS-III). Visual memory: Faces I and II (WMS-III). Working memory: PASAT. Sorting: Sorting Test (D-KEFS). Distractibility: CPT. Reaction time: CPT.	Mean score (SD) Processing speed -0.01 (0.45) Verbal ability 0.17 (0.87) Verbal memory 0.68 (0.80) Visual memory 1.04 (0.69) Working memory 0.69 (0.65) Sorting 0.52 (0.91) Distractibility 0.20 (0.45) Reaction time -0.57 (1.14) Block design 0.11 (0.84)	Mean score (SD) Processing speed 0.25 (0.52) Verbal ability 0.17 (0.71) Verbal memory 0.69 (0.69) Visual memory 1.05 (0.80) Working memory 0.64 (0.92) Sorting 0.55 (0.73) Distractibility 0.16 (0.81) Reaction time 0.16 (0.88) Block design 0.18 (0.76)	-	-	Domain scores adjusted for age, education, and baseline score. The linear mixed-methods model indicated that older patients who received chemotherapy had lower post-treatment processing speed performance (z-score difference,-0.16 per 10 years increase in age; 95%CI: -0.29 to -0.04) compared with healthy controls.
	Convenience sample 64 women, aged 18-70 years, newly diagnosed with breast cancer, without history of neurologic disorders or axis I psychiatric disorders, consecutively recruited from one centre.	0 (16.7%) I (47.0%) II (28.0%) IIIA (8.3%)	CT: 0%	~1.5 (follow up at 18 months after treatment)	Convenience sample 39 women without cancer recruited through community advertisements; frequency matched for age and education (categories of matching not reported).		Mean score (SD) Processing speed -0.09 (0.65) Verbal ability -0.04 (0.73) Verbal memory 0.38 (0.93) Visual memory 1.02 (0.71) Working memory 0.44 (0.95) Sorting 0.21 (0.86) Distractibility -0.02 (1.05) Reaction time -0.28 (0.95) Block design -0.07 (0.82)	Mean score (SD) Processing speed 0.25 (0.52) Verbal ability 0.17 (0.71) Verbal memory 0.69 (0.69) Visual memory 1.05 (0.80) Working memory 0.64 (0.92) Sorting 0.55 (0.73) Distractibility 0.16 (0.81) Reaction time 0.16 (0.88) Block design 0.18 (0.76)	-	-	Domain scores adjusted for age, education, and baseline score. The linear mixed-methods model indicated that older patients not exposed to chemotherapy had lower post-treatment Processing Speed performance (z-score difference, -0.11; 95%CI, -0.21 to -0.001).

Collins et al., 2014 [57] Canada	Convenience sample 60 women, aged 18-65 years, with at least the 8th grade of education, newly diagnosed with non-metastatic breast cancer, scheduled to receive CT, recruited in one hospital; patients who had disease progression during follow up were excluded.	I-III (100%)	CT: 100%	~ 1 (follow up at 12 months after CT)	Convenience sample 60 women recruited through hospital advertisements and peer nomination, with at least the 8th grade of education; matched on age, education and first language (categories of matching not reported).	Processing Speed: Digit-Symbol Coding & Symbol Search (WAIS-III); TMT-A; TMT-B; Processing speed & Reaction time indices (CNS-VS). Working Memory: Digit Span & Letter-Number-Sequencing (WAIS-III); PASAT; ACTT; COWA; Flexibility & working memory indices (CNS-VS). Visual Memory Visual memory index (CNS-VS). Verbal Memory HVLT-; verbal memory index (CNS-VS).	Prevalence: 22%	Prevalence: 6%	PR= 3.67* †	95%CI: 1.21-11.12	Cut off for case: A standardised-regression based score of ≥ -2.0 on 3 or more of the 19 cognitive measures
Fan et al., 2005 [58] Canada	Convenience sample 91 women with breast cancer without relapse, with no psychiatric history and no use of psychotropic medications other than benzodiazepines for nausea, sleep, or anxiety.	ND	CT: 100% RT: 65% HT: 67%	~ 1 (follow up at 1 year after CT)	Convenience sample 102 healthy women, acquaintances or relatives of the patients; individual matching for age (± 5 years).	HSCS, mild dysfunction	Prevalence: 30.8%	Prevalence: 19.3%	PR= 1.60 †	95%CI: 0.93-2.73	-
						HSCS, moderate to severe dysfunction	Prevalence: 4.4%	Prevalence: 3.6%	PR= 1.22 †	95%CI: 0.28-5.31	
						TMT-A	Median score: 44.0	Median score: 45.0	-	P= 0.25	
						TMT-B	Median score: 49.0	Median score: 54.0	-	P= 0.0005 *	
				~ 2 (follow up at 2 year after CT)		HSCS, mild dysfunction	Prevalence: 21.3%	Prevalence: 11.1%	PR= 1.92 †	95%CI: 0.91-4.04	
						HSCS, moderate to severe dysfunction	Prevalence: 3.8%	Prevalence: 0.0%	PR= 3.88 †	95%CI: 0.33-28.77	
						TMT-A	Median score: 47.0	Median score: 49.0	-	P= 0.61	
						TMT-B	Median score: 50.0	Median score: 53.0	-	P= 0.048 *	
Hermelink et al., 2017 [36] Germany	Convenience sample 56 women with breast cancer, aged 18-65 years, with no history of neurological disorders and no previous systemic treatment.	0 (7%) I (42%) II (41.4%) III (%9.6)	CT: 100% HT: 73.9% vs. CT: 0% HT: 80.7%	~ 1 (follow up at 1 year after diagnosis)	Convenience sample 150 women aged 18-65 years, who never had cancer, and attended the same institution as cases for breast imagining and did not require further tests.	Attention TAP; TMT-A, Memory Digit span (WSM-R); VLMT. Executive function TMT-B; lexical and semantic search (RWT).	Composite z-score: No CT: 0.04 (0.45); CT: -0.10 (0.42)	Composite z-score: 0.10 (0.38)	-	P= 0.01 *	Composite score of overall performance calculated as the mean across all age- and education-adjusted cognitive indices (age and education categories in the models not reported). Cognitive change scores were further adjusted for cognitive scores at baseline.
							Composite score, change in the first year of diagnosis: No CT: -0.01 (0.38) CT: -0.07 (0.37)	Composite score, change in the first year of diagnosis 0.11 (0.35)	-	P=0.02 *	
							Prevalence: 17.7%	Prevalence: 5.3%	RR= 2.43	95% CI: 0.89 - 6.65	≥5 scores below 1.5 SD and/or ≥4 scores below 2 SD.

Jenkins et al., 2006 [59] United Kingdom	Convenience sample 128 women diagnosed with early breast cancer across the UK, with no disease progression	'early breast cancer'	Srg, M: 26% CT: 66.4%	~ 1 (follow up at 12 months after CT)	Convenience sample 49 healthy women who were friends or family of the patients, or from the local women's support group	Verbal memory Logical memory (WMS); Immediate & delayed recall (AVLT). Visual memory Complex figure task. Executive function The Stroop task Working memory Spatial span, letter/number sequencing & digit span (WMS-III) Processing speed Letter cancellation task.	Prevalence of decline on ≥2 measures as measured by the reliable change index: 16.8%	Prevalence of decline on ≥2 measures as measured by the reliable change index: 10.6%	PR= 1.58 †	95%CI: 0.64-3.90	Reliable change index corrected for practice effects.
Phillips et al., 2012 [60] United States	Convenience sample 129 women diagnosed with breast cancer and scheduled to receive CT or RT; patients with recurrence were excluded	0 (10%) I (53%) II (37%)	Srg, M: 91.5% Srg, C: 8.5% HT: 62%	3 (follow up at 26 months after RT)	Convenience sample 184 women with no history of cancer, individual matching for age (±5 years) and ZIP code.	Attention Trial 1 Color Trails Test; Digit & Spatial Span (WAIS-III). Executive functioning Digit Symbol Coding (WAIS-III); Trial 2 Color Trails Test; COWAT. Nonverbal memory Visual Reproduction test (WMS-III). Processing speed Ruff 2 & 7 Test. Verbal memory CVLT.	Score Means (SE) CT group: Attention 53.55 (0.72) Executive functioning 51.87 (0.81) Nonverbal memory 56.24 (0.95) Processing speed 49.90 (0.84) Verbal memory 50.67 (1.11) RT group: Attention 51.59 (0.68) Executive functioning 52.30 (0.77) Nonverbal memory 54.97 (0.90) Processing speed 49.03 (0.80) Verbal memory 50.75 (1.05)	Score Means (SE) Attention 51.78 (0.41) Executive functioning 54.63 (0.46) Nonverbal memory 55.90 (0.54) Processing speed 51.38 (0.48) Verbal memory 51.26 (0.63)	-	P<0.05 *	Score means are adjusted for age, T1 National Adult Reading Test scores, and time from T1 to T2 assessments. Significant group x time interaction detected for processing speed (P=0.009).
Schagen et al., 2006 [61] The Netherlands	Convenience sample 57 women who had breast cancer treated with RT but not CT, and no relapse	I (100%)	RT: 100% CT: 0% HT: 0%	~1	Convenience sample 60 healthy women, friends of the participants in the study	24 test indices, covering the following domains: focused-sustained attention, working-verbal-visual memory, processing speed, executive function, and verbal/motor function	Prevalence: 22.8%	Prevalence: 6.7%	OR= 2.1	95%CI: 0.5-8.4	Odds ratio adjusted for age and IQ. Cognitive impairment defined as scoring 2 SD below the mean of the control group for ≥3 of the 24 tests.

Cross-sectional studies involving neurocognitive assessment batteries											
Boele et al., 2015 [11] The Netherlands	Convenience sample Post-menopausal breast cancer survivors with no psychiatric history, who did not receive CT, selected from medical records.	ND	Srg, ND: 95% CT: 0% RT: 65% HT: 100% / 0%	Exposure to HT: 3.2 (1.9), 1.5-7; Unexposed to HT: 2.8 (0.3), 2.3-3.3.	Convenience sample 44 friends or family members of the women who had had breast cancer, with no history of breast cancer; matched for age and education (method of matching not reported).	Verbal memory AVLT; Visual association test. Visual memory WMS. Working memory Letter-number sequencing (WAIS-III) Executive functioning Stroop; TMT-B. Processing speed Stroop; TMT-A Reaction speed Fepsy reaction times Fluency Category fluency, letter fluency Motor functioning Fepsy tapping	Domain z-scores by treatment group: Verbal memory HT: -0.49 (0.66) Srg+RT: -0.01 (0.63) Visual memory HT: 0.136 (0.80) Srg+RT: -0.25 (1.09) Working memory HT: -0.144 (0.82) Srg+RT: 0.08 (1.06) Executive functioning HT: -0.10 (0.92) Srg+RT: 0.07 (0.93) Processing speed HT: -0.06 (0.65) Srg+RT: -0.01 (0.82) Reaction speed HT: 0.24 (0.79) Srg+RT: -0.12 (1.07) Fluency HT: -0.41 (0.78) Srg+RT: -0.31 (0.70) Motor functioning HT: 0.29 (0.70) Srg+RT: 0.14 (0.84)	Domain z-scores: Verbal memory -0.001 (0.81) Visual memory 0.000 (0.95) Working memory 0.001 (1.00) Executive functioning 0.000 (0.88) Processing speed 0.000 (0.79) Reaction speed 0.000 (0.91) Fluency 0.000 (0.88) Motor functioning 0.000 (0.96)	-	Verbal memory P=0.009 * Visual memory P=0.339 Working memory P=0.965 Executive functioning P=0.444 Processing speed P=0.554 Reaction speed P=0.529 Fluency P=0.012 * Motor functioning P=0.667	P-value for the three-group comparison. Z-scores corrected for age and estimated premorbid IQ.
Brezden et al., 2000 [62] Canada	Convenience sample 40 women who had completed CT for breast cancer, at least the 8th grade of education, with no history of cognitive dysfunction or psychiatric illnesses and with no clinical evidence of recurrence or metastases.	I-II (ND)	CT (100%)	2 (ND), >1	Convenience sample 36 healthy female relatives of the patients or hospital personnel who volunteered for the study.	HSCS	Median score: 34.5 Prevalence of moderate and severe cognitive impairment: 50%	Median score: 26.0 Prevalence of moderate and severe cognitive impairment: 11%	- PR= 4.5 * †	P>0.05 95%CI: 1.71-12.11	When adjusted for age, menopausal status, and level of education (categories not reported), the difference was significant (P=0.046). -

Calvio et al., 2010 [7] United States	Convenience sample 122 breast cancer survivors ≥1 year post treatment, working full-time for ≥1 year, with computer and internet, recruited via advertisements and flyers.	I (36.9%) II (44.3%) III (17.2%)	Srg, ND: 96.7% CT: 82.8% RT: 73.0% HT: 45.9% IT: 13.1%	3.1 (2.4), 1-10	Convenience sample 113 women without a previous cancer diagnosis, working full-time for ≥1 year, with computer and Internet, recruited via advertisements and flyers.	CNS-VS battery Composite memory Verbal memory Visual memory Executive function Attention	Composite memory: 101.7 (18.1) Verbal memory: 99.8 (16.6) Visual memory: 102.8 (17.1) Executive function: 98.6 (9.2) Attention: 83.8 (10.3)	Composite memory: 97.1 (19.8) Verbal memory: 96.0 (20.0) Visual memory: 99.3 (17.1) Executive function: 94.5 (16.4) Attention: 80.2 (17.7)	-	Executive function: P<0.001 * Attention: P<0.05 * All other domains P>0.05	Lower scores indicate poorer functioning. Mean scores adjusted for marital status (cohabitating with partner vs. single/not cohabitating), race (Caucasian vs. non-Caucasian), ethnicity (Hispanic vs. non-Hispanic), age (<40, 41-50, 51-65), income (0-39,000; 40-59,000; 60-79,000; 80-89,000; 80-99,000; ≥100,000), and menopausal status (currently going through, premenopausal, postmenopausal).
Castellon et al., 2004 [15] United States	Convenience sample 53 women who had breast cancer at or before the age of 50, with no evidence of disease or recurrence, and no history of psychiatric disorder.	0-II (100%)	CT: 34% CT+HT: 34%	2-5	Convenience sample 19 Healthy women recruited via fliers, newsletter articles and advertisements, or amongst the acquaintances of the hospital staff.	Verbal Fluency COWA. Verbal Learning CVLT. Verbal Memory Logical memory (WMS-R). Visual Memory Visual Reproduction (WMS-R); RCFT. Visuospatial Function Block Design (WAIS-III); Copy Trial (RCFT). Psychomotor Speed Digit Symbol (WAIS-III); TMT-A; TMT-B. Reaction Time CCAP Executive Attention PASAT; Stroop Test.	z-scores, no CT nor HT: Fluency: -0.36 Verbal Learning: 0.54 Verbal memory: 0.21 Visual memory: 0.45 Visuospatial: 0.42 Reaction time: -0.20 Psychomotor speed: 0.22 Executive attention: -0.01 z-scores, CT (with or without HT): Fluency: -0.64 Verbal learning: 0.03 Verbal memory: -0.35 Visual memory: -0.39 Visuospatial: -0.51 Reaction time: -0.49 Psychomotor speed: 0.03 Executive attention: -0.41	Ref the mean scores of the healthy women used to calculate the z-scores.	-	Verbal Fluency: P=0.007 * All other domains: p>0.05	-

Conroy et al., 2013 [18] United States	Convenience sample 24 breast cancer survivors with history of non-metastatic disease and chemotherapy treated.	I (29%) IIa (33%) IIb (25%) IIIa (8%) IIIb (4%)	CT: 100% RT: 79%	6.4 (2.1), 3.2-10.2	Convenience sample 23 healthy women; matched for age and education (matching method not reported).	Learning AVLT; BLT. Memory AVLT; BLT. Attention Digit span (WAIS-III); PASAT. Language WRAT-4; Word Reading test; Vocabulary (WASI). Visuospatial Block Design (WASI) Executive Digit span; COWA; Color-Word Test, Sorting Test, & Trail Making Test (D-KEFS). Psychomotor Symbol Digit, and Grooved Pegboard.	Age-adjusted domain z-scores: Learning: -0.2 (0.7) Memory: -0.3 (0.6) Attention: 0.4 (0.6) Language: 0.3 (0.8) Visuospatial: -0.5 (1.0) Executive: -0.04 (0.7) Psychomotor: -0.1 (0.4) Average: -0.1 (0.5)	Age-adjusted domain z-scores: Learning: 0.1 (0.7) Memory: 0.2 (0.7) Attention: 0.03 (0.5) Language: -0.03 (0.9) Visuospatial: 0.1 (0.9) Executive: 0.04 (0.6) Psychomotor: 0.04 (0.4) Average: 0.1 (0.4)	-	Memory: P≤0.05 * All other domains: P>0.05	-
Ernst et al., 2002 [63] United States	Convenience sample 16 women aged 65-80 years, recruited via advertisements.	'localised breast cancer'	HT: 100% Srg, ND: 100% CT: 0%	4.4 (1.7), 2-10	Convenience sample 33 women with no history of breast cancer; matched for age (matching method not reported).	Digit symbol substitution test	Nr of correct substitutions (SD): 7.5 (3.1)	Nr of correct substitutions (SD): 7.2 (2.1)	-	P>0.05	-
						TMT-A	Time required (SD): 44.2 (12.2)	Time required (SD): 36.9 (10.4)	-	P>0.05	-
Inagaki et al., 2006 [64] Japan	Convenience sample 105 women who had breast cancer aged 18-55 years, with no history of neurological or psychiatric disorders other than affective or anxiety; tumor free at recruitment.	0-I (27.5%)	Srg, C: 49% CT: 100% HT: 39% RT: 48%	1	Convenience sample 55 healthy subjects who lived in the same area as the patients recruited via advertisements in the local newspaper; matched for region (matching method not reported).	WMS-R	Mean domain score (SD): Attention 99.4 (12.5) Verbal memory 96.9 (13.0) Visual memory 101.9 (12.1) Delayed recall 100.3 (10.4)	Mean domain score (SD): Attention 99.6 (13.0) Verbal memory 99.2 (14.4) Visual memory 101.4 (10.3) Delayed recall 100.7 (12.6)	-	For all domains: P>0.05	-

Kesler et al., 2013 [34] United States	Convenience sample 44 women who had breast cancer recruited via support groups and advertisements; patients excluded if they had had disease recurrence or relapse	I-IIIA	Srg, ND: 100% CT: 100%	4.8 (3.4), 1-12	Convenience sample 38 healthy female controls recruited through advertisements	MMQ; HVLT-R; WAIS	Mean scores (SD): HVLT-R total recall: 49.3 (8.0) HVLT-R delayed recall: 49.8 (6.4) MMQ: 42.2 (11.2) WAIS-IQ: 112 (11)	Mean score (SD): HVLT-R total recall: 57.1 (9.6) HVLT-R delayed recall: 56.0 (8.1) MMQ: 59.3 (7.4) WAIS-IQ: 115 (13)	-	P=0.03 * P=0.02 * P<0.001 * P=0.29	-
Koppelmans et al., 2012 [42] The Netherlands	Convenience sample 196 women who had been treated for breast cancer between 1976 and 1995, were aged 50-80 years in 2008, did not have recurrence or a second primary cancer and never used adjuvant hormone therapy.	I-III (100%)	HT: 0% CT: 100%	21 (4.4), ND	Convenience sample All 1,509 women without a history of cancer who were 50-80 years of age at the time of the assessments, selected from a larger population-based cohort.	Learning and memory (15-WLT)	Trial 1: 5.5 (2.2) Trial 2: 8.6 (2.4) Trial 3: 10.3 (2.6) Total: 24.3 (6.2) Delayed recall: 8.0 (2.9) Recognition: 13.8 (1.8)	Trial 1: 5.9 (2.4) Trial 2: 9.0 (2.7) Trial 3: 10.6 (2.9) Total: 25.5 (6.9) Delayed recall: 8.7 (3.2) Recognition: 13.8 (2.0)	-	P=0.008 * P=0.02 * P=0.17 P=0.02 * P=0.002 * P=0.76	Adjusted for age and education (categories of the variables used in the models not reported).
						Processing speed (LDST)	Total correct: 31.8 (6.7)	Total correct: 32.5 (7.5)	-	P=0.14	
						Stroop color-word test	Word card: 16.8 (3.3) Color card: 23.3 (4.4) Color-word card: 45.8 (12.6)	Word card: 16.5 (3.7) Color card: 22.2 (4.9) Color-word card: 43.5 (14.0)	-	P=0.14 P=0.001 * P=0.02 *	
						Verbal fluency (WTF)	Total: 24.1 (6.1) 15sec: 13.8 (4.8)	Total: 24.2 (6.8) 15sec: 13.8 (5.4)	-	P=0.89 P=0.95	
						Visuospatial (DOT)	Total correct: 28.9 (9.2)	Total correct: 28.9 (9.7)	-	P=0.99	
						Motor speed (PPB)	Both hands: 11.1 (1.6) Dominant hand: 13.8 (1.9) Nondominant hand: 12.9 (1.8)	Both hands: 11.2 (1.8) Dominant hand: 13.8 (2.1) Nondominant hand: 13.4 (2.0)	-	P=0.56 P=0.81 P=0.001 *	
Kreukels et al., 2008 [12] The Netherlands	Convenience sample 63 women who had been treated with CT for non-metastatic breast cancer, with no history of psychiatric diseases	I-III (100%)	CT: 100% HT: 40%	~ 1	Convenience sample 60 Female friends or relatives of the patients with the same approximate age who never had cancer; matched for age (matching method not reported).	TMT-A; Digit Symbol (WAIS); Stroop Color Word Test; Eriksen Task, Working-Memory Updating, CVLT, Visual Reproduction of the WMS, AFM Task, TMT-B, Word Fluency, Fepsy Finger Tapping.	Prevalence of cognitive impairment: 33.3%	Prevalence of cognitive impairment: 10%	RR= 5.51 *	95%CI: 1.86-16.28	Cognitive impairment defined as 2 standard deviations below the mean of the healthy control group on ≥ 3 tests. RR adjusted for age and premorbid IQ.

Lejbak et al., 2010 [65] Canada	Convenience sample 28 post menopausal women with oestrogen positive breast cancer, aged 40 and 80 years, recruited from the local cancer registry and oncology centre	I (100%)	HT: 100% Srg, ND: 83% RT: 67%	3 (1), 2-5	Convenience sample 37 age-equivalent controls recruited through mailed invitations	Immediate verbal memory: List Learning, Story Memory. Delayed verbal memory List Recall, Story Recall. Complex visuomotor attention: Coding Letter fluency: COWA Object location memory task Speeded manual dexterity: Grooved Pegboard Complex working memory Verbal n-Back	Mean score (SD): List Learning 29.0 (5.1) List Recall 7.1 (2.2) Story Memory 17.1 (3.6) Story Recall 9.0 (2.3) Coding 42.9 (9.5) Letter Fluency 40.0 (10.8) Object-Location 47.5 (21.1) Grooved Pegboard 80.9 (17.1) Verbal n-Back 119.9 (9.7)	Mean score (SD) List Learning 30.3 (3.8) List Recall 6.8 (2.2) Story Memory 18.4 (3.3) Story Recall 9.7 (2.1) Coding 49.3 (9.2) Letter Fluency 44.3 (11.2) Object-Location 44.4 (20.0) Grooved Pegboard 67.76 (12.7) Verbal n-Back 123.0 (9.5)	- - - - - - - - -	P=0.24 P=0.58 P=0.15 P=0.23 P=0.01 * P=0.03 * P=0.55 P<0.01 * P=0.23	Higher scores indicate better performance.
Miao et al., 2016 [9] China	Convenience sample 23 patients with breast cancer who had been treated with chemotherapy at a local hospital	I-III (100%)	CT: 100%	3 (0.3),	Convenience sample 26 age matched healthy controls selected amongst patients relatives and local universities; matched for age (matching method not reported).	Stroop interference test; MoCA	Mean score (SD) Stroop: 35.04 (8.96) MoCA: 26.00 (1.34)	Mean score (SD) Stroop: 30.17 (6.49) MoCA: 26.58 (1.74)	- -	P=0.04 * P>0.05	Higher score in the Stroop interference test indicates worse performance.
Myers et al., 2015 [66] United States	Convenience sample 156 breast cancer patients recruited across 24 states using newsletters and flyers	I (26%) II (47%) III (14%) IV (5%)	CT: 100% RT: 71.2% HT: 49.4%	1-2 2-5 >5	Convenience sample 46 healthy controls recruited using flyers	FACT-COG, Perceived cognitive impairments (PCI) Perceived cognitive abilities (PCA)	Mean score (SD): PCI: 48.6 (17.2) PCA: 17.6 (7.2) PCI: 41.7 (18.3) PCA: 15.9 (6.8) PCI: 50.4 (18.2) PCA: 19.0 (6.9)	Mean score (SD): PCI: 61.1 (9.4) PCA: 19.1 (8.8) PCI: 61.1 (9.4) PCA: 19.1 (8.8) PCI: 61.1 (9.4) PCA: 19.1 (8.8)	- - -	P<0.05 * P>0.05 P<0.05 * P<0.05 * P<0.05 * P<0.05 *	Higher scores indicate higher cognitive function.

Nguyen et al., 2013 [39] United States	Convenience sample 57 women survivors of breast cancer, aged over 65 years, without recurrence, recruited from the cancer registry	I-IIIA (100%)	RT: 53% CT: 100%	>10	Convenience sample 30 healthy female adults, selected in the community for a previous study	Intelligence and mental status WASI; Wide Range Achievement Test-III reading subtest; Folstein mini mental state examination. Attention and working memory Digit Span, Letter-Number Sequencing, and Arithmetic subtests (WAIS-III) Psychomotor speed TMT-A. Language COWA; Boston Naming Test Visuospatial RCFT-Copy Condition; Benton Facial; Recognition Test. Memory AVLT; RCFT-Delay Condition. Benton Visual Retention Test-Revised. Executive functioning Wisconsin Card Sorting Test. TMT-B.	WASI Vocabulary: 64.5 (7.8) Block design: 33.9 (12.3) Similarities: 36.8 (4.8) Matrix design: 20.6 (6.5) Wide Range Achievement Test-III Reading: 48.1 (4.7) Digit span: 15.5 (3.4) Letter–Number Seq 9.1 (2.1) Arithmetic total 12.4 (2.8) TMT A time: 37.8 (8.9) B-time: 97.0 (35.5) COWA: 39.4 (15.1) Boston Naming Test 57.0 (2.5) Rey–Osterrieth Complex Figure Copy: 33.3 (2.0) Delay: 15.9 (5.1) Benton Faces total 44.4 (3.4) Benton Visual Retention Test total 5.3 (2.2) Rey Auditory-Verbal Learning Test Total: 48.6 (8.3) Delay: 10.2 (2.6) IED: 3.2 (4.2) Wisconsin: Perseverative: 12.5 (6.9) Errors: 11.0 (5.7) Categories: 2.9 (1.6)	WASI Vocabulary: 63.7 (6.9) Block design: 34.8 (11.9) Similarities: 36.6 (3.0) Matrix design: 21.8 (6.8) Wide Range Achievement Test-III Reading: 50.2 (5.0) Digit span: 16.9 (4.4) Letter–Number Seq 11.0 (2.0) Arithmetic total 13.7 (3.2) TMT A time: 29.3 (8.7) B-time: 72.4 (26.6) COWA: 38.8 (11.1) Boston Naming Test 56.1 (3.0) Rey–Osterrieth Complex Figure Copy: 32.0 (2.9) Delay: 15.6 (5.6) Benton Faces total 45.5 (3.8) Benton Visual Retention Test total 4.4 (2.8) Rey Auditory-Verbal Learning Test Total: 49.4 (8.7); Delay: 10.6 (2.3). IED: 1.3 (1.0) Wisconsin: Perseverative: 16.6 (12.2) Errors: 14.9 (11.0) Categories: 5.0 (1.9)	-	P<0.05 *: Letter–Number Seq; Trail making test A and B; Boston naming test; Rey–Osterrieth Complex Figure; Benton Visual Retention; Rey Auditory-Verbal Learning; IED; Wisconsin Card Sorting categories. P>0.05 All other tests.	-

Root et al., 2015 [17] United States	Convenience sample 113 women aged <70 years who had breast cancer, post-menopausal at diagnosis, with no recurrence, no neurological or psychiatric diagnoses.	I (58%) II (0%) III (33%) IV (8%)	Srg, C: 75% Srg, M: 32% CT: 52% RT: 78% HT: 52%	4.2 (1.2)	Convenience sample 37 health women with no history of cancer or cancer treatment, post-menopausal, with no neurological or psychiatric diagnoses; matched for age and education (method of matching not reported).	FACT-COG	Mean score (SD) Memory: 20.4 (5.9) Verbal 18.5 (4.8) Concentration 12.4 (3.2) Mental acuity 12.0 (3.4) QoL impact 13.7 (3.0) PCI: 56.5 (12.7) PCA: 19.5 (6.3)	Mean score (SD): Memory: 23.5 (3.2) Verbal: 19.2 (3.6) Concentration: 13.6 (2.4) Mental acuity: 13.4 (2.0) QoL impact: 14.3 (2.4) PCI: 59.4 (8.3) PCA: 22.7 (4.5)	-	P=0.003 * P=0.42 P=0.04 * P=0.02 * P=0.27 P=0.20 P=0.005 *	-
Silverman et al., 2007 [67] United States	Convenience sample 24 women who had breast cancer and were right handed.	ND	CT+HT: 52% CT: 24%	ND (ND), 5-10	Convenience sample 10 healthy controls who had undergone PET studies before, free of cognitive impairments.	RCFT- recall test	Mean (SD): 20.6 (4.8)	Mean (SD): 23.8 (6.3)	-	P>0.05	Lower scores represent worse functioning.
Von Ah et al., 2009 [44] United States	Convenience sample 52 women aged ≥40 years, who had breast cancer, recruited from cancer support groups, advertisements in the community centres, or by referral of enrolled participants.	I-II (50%) III (ND)	Srg, C: 66% Srg, M: 33% CT: 55.8% RT: 80.8% HT: 79%	4.6 (2.8), 1.2-15.8	Convenience sample 52 women aged ≥40 years, with no history of cancer, no history of psychiatric illnesses, recruited from advertisements in churches and community centres, or by referral of enrolled participants; individual matching for age (±5 years) and education (±3 years).	Memory: AVLT Attention: Digit span (WAIS-III) Attention: Symbol digit modalities test Executive function: COWA Subjective memory function: Squire SRS	Sum recall: 48.5 (7.2) Delayed recall: 9.6 (2.8) 17.8 (4.0) 53.6 (8.2) 38.2 (10.9) 92.9 (17.9)	Sum recall: 52.4 (8.1) Delayed recall: 10.9 (2.8) 17.7 (4.1) 54.1 (10.4) 42.2 (12.4) 102.9 (22.6)	- - - - -	P=0.01 * P=0.89 P=0.79 P=0.08 P=0.01 *	- - - - -

ACTT = Auditory Consonant Trigrams Test [68]; AFM = Additive factors method task [69]; AVLT = Rey Auditory Verbal Learning Test [70]; BC = breast cancer; BLT = Brown Learning Test [71]; CCAP - California Computerized Assessment Package [72]; CNS-VS = CNS vital signs battery [73, 74]; COWA = Controlled Oral Word Association [75]; CPT = Continuous Performance test [76]; CT = chemotherapy; CVLT = California Verbal Learning Test [77]; D-KEFS = Delis-Kaplan Executive Function System [78]; DOT = Design organization test [79]; EORTC-QLQ-CF = the European Organization for Research and Treatment of Cancer [80]; FACT-COG = Functional Assessment of Cancer Therapy for Cognition [81]; HSCS = High Sensitivity Cognitive Screen [82]; HT = hormone therapy; HVLT-R = Hopkins verbal learning test revised [83]; IT = immunotherapy; LDST = Letter Digit Substitution Test [84]; MoCA = Montreal Cognitive Assessment Test [85]; Multifactorial Memory Questionnaire Ability Scale [86]; ND = not defined; OR = odds ratio; PASAT = Paced Auditory Serial Addition Test [87]; PCA = Perceived cognitive abilities; PCI = Perceived cognitive impairments; PPB = Purdue Pegboard test [88]; PR = prevalence ratio; RCFT = Rey-Osterrieth Complex Figure Test, Copy Condition [89-91]; RT = radiotherapy; RWT = Regensburg word fluency test [92]; SD = standard deviation; Srg, C = Breast conserving surgery; Srg, ND = Surgery, not further specified; Srg, M = Mastectomy; Srg, R = Breast reconstructive surgery; SRS = Squire self-report scale [93]; TAP = Test of Attentional Performance [94]; TMT-A = Trail Making Test-A [95]; TMT-B = Trail Making Test-B [95]; WAIS-III = Wechsler Adult Intelligence Scale-III [96]; WASI = Wechsler Abbreviated Scale of Intelligence [97]; 15-WLT = 15-Word Learning Test [98]; WMS-R = Wechsler Memory Scale-Revised [99]; WRAT = Wide Range Achievement Test [100]; WTF = Word Fluency Test [101]; yrs = years; 95%CI = 95% confidence interval.

* There was some statistical evidence (P<0.05) for a different prevalence, risk or severity of anxiety between breast cancer survivors and women who did not have cancer.
† Prevalence ratio calculated by the authors of the present study.

Supplementary Table 6. Sexual dysfunction: main characteristics and results of the studies that provided data on the frequency and/or severity of sexual dysfunction in breast cancer survivors (>1 year) and women who did not have cancer.

First author, year of publication Country	Breast cancer survivors				Comparison group	Outcome assessment	Prevalence / cumulative incidence of the outcome		Relative risk estimate (RR, OR, SIR, PR)	P-value or 95% confidence interval	Notes
	Type of population and main characteristics	Stage at diagnosis (%)	Breast cancer treatments: %	Time since diagnosis/ treatment in years: mean/ median (SD), range	Type of population and main characteristics		Breast cancer survivors	Comparison group			
Cross-sectional studies											
Boehmer et al., 2014 [102] United States	Convenience sample 85 lesbian or bisexual breast cancer survivors, with no metastatic breast cancer or secondary cancers, recruited via advertisements, flyers, and other promotional materials distributed online and in print media (<5% had cancer recurrence).	0 (16.5%) I (28.2%) II (37.7%) III (8.2%) Unknown (9.4%)	Srg C: 41.2% Srg, M: 40.0% CT: 61.2% RT: 58.8% HT: 45.9%	4.5 (2.3), 1-10	Convenience sample 85 lesbian or bisexual women with no history of cancer, not using hormone replacement therapy, recruited via flyers, advertisements, etc.; individual matching for age (± 3 years) and partner status (partnered vs. unpartnered).	Scale: FSFI	Prevalence: 52.5%	Prevalence: 4.3%	All women: OR=1.44 Sexually active: OR=1.79	All women: 95%CI: 0.72-2.90 Sexually active: 95%CI 0.78-4.07	40% of the cases and 31% of the controls were sexually inactive.
						Scale: FSFI Overall score	Mean score (SD): 24.0 (7.2)	Mean score (SD): 26.0 (5.3)	-	P=0.08	
						Subscales: Desire	4.3 (2.0)	5.7 (2.2)	-	P<0.01 *	
						Arousal	13.2 (5.3)	14.9 (4.5)	-	P=0.07	
						Lubrication	13.5 (6.0)	11.6 (1.1)	-	P=0.03 *	
						Orgasm	11.1 (4.1)	12.6 (3.2)	-	P=0.04 *	
						Satisfaction	11.0 (3.2)	11.8 (3.2)	-	P=0.22	
						Pain	12.8 (3.2)	14.1 (1.8)	-	P=0.03 *	
Safarinejad et al., 2013 [103] Iran (continues)	Convenience sample 186 women cancer survivors aged 25-45, with BMI<30 kg/m^2, in a relationship and attempted intercourse weekly, with no breast cancer recurrence, no other cancer, no psychopathology, no relationship disturbances, no diabetes or cardiac, renal, neurological, or liver disease, among others; identified from the cancer registry.	I (62.4%) II (37.6%)	Srg, C: 100% Srg, M: 0% CT: 67.7% RT: 46.2% HT: 79.6%	2.4 (ND), >1	Convenience sample 204 women without cancer aged 25-45 in a relationship, who attempted intercourse weekly, in same geographical area of cases, with BMI<30kg/m^2, no psychopathology, no relationship disturbances, no diabetes or cardiac, renal, neurological, or liver disease, among others, recruited from a private clinic; matched for age (matching method not reported).	Scale: FSFI	Prevalence of dysfunction: 52.5% By treatment: RT+CT: 44.6% CT+HT: 46.2% CT+RT+HT: 66.7%	Prevalence: of dysfunction: 28.7%	PR=1.81 * † By treatment: PR= 1.55 * PR= 1.61 * OR= 8.2 *	95%CI: 1.40-2.34 By treatment: 95%CI: 1.13-1.98 95%CI: 1.32-1.90 95%CI: 6.5-14.2	Odds ration adjusted for age, body mass index, occupational status, educational level, smoking history, serum hormonal levels, tumour stage and grading. The categorization of the variables included in the model were not reported.
						FSFI Subscales:	All treatments: 41.9%		PR=1.50 * †	95%CI: 1.13-1.98	
						Desire	By treatment: RT+CT: 33% CT+HT: 42% CT+RT+HT: 53%	28.0%	By treatment: OR= 1.8 OR= 3.6 * OR= 4.7 *	By treatment: 95%CI: 0.9-2.2 95%CI: 2.6-6.8 95%CI: 2.8-8.7	
						Arousal	All treatments: 33.9% By treatment: RT+CT: 31% CT+HT: 30% CT+RT+HT: 50%	25.0%	PR=1.36 † By treatment: OR= 1.6 OR= 1.5 OR= 4.2 *	95%CI: 0.99-1.85 By treatment: 95%CI: 0.8-2.8 95%CI: 0.8-2.8 95%CI: 2.6-8.2	
						Orgasm	All treatments: 41.9% By treatment: RT+CT: 33% CT+HT: 41% CT+RT+HT: 56%	29.0%	PR=1.44 * † By treatment: OR= 2.1 OR= 3.2 * OR= 5.2 *	95%CI: 1.10-1.90 By treatment: 95%CI: 0.8-3.4 95%CI: 2.4-7.1 95%CI: 3.7-10.2	

Safarinejad et al., 2013 [103] Iran (continued)	Convenience sample 186 women cancer survivors aged 25-45, with BMI<30 kg/m^2, in a relationship and attempted intercourse weekly, with no breast cancer recurrence, no other cancer, no psychopathology, no relationship disturbances, no diabetes or cardiac, renal, neurological, or liver disease, among others; identified from the cancer registry.	I (62.4%) II (37.6%)	Srg, C: 100% Srg, M: 0% CT: 67.7% RT: 46.2% HT: 79.6%	2.4 (ND), >1	Convenience sample 204 women without cancer aged 25-45 in a relationship, who attempted intercourse weekly, in same geographical area of cases, with BMI<30kg/m^2, no psychopathology, no relationship disturbances, no diabetes or cardiac, renal, neurological, or liver disease, among others, recruited from a private clinic; matched for age (matching method not reported).	Pain	All treatments: 39.2% By treatment: RT+CT: 31% CT+HT: 36% CT+RT+HT: 59%	Prevalence: 30.0%	PR=1.31 † By treatment: OR= 1.2 OR= 2.2 * OR= 5.6 *	95%CI: 0.99-1.72 By treatment: 95%CI: 0.96-1.8 95%CI: 1.5-3.8 95%CI: 3.2-11.4	Odds ratio adjusted for age, body mass index, occupational status, educational level, smoking history, serum hormonal levels, tumour stage and grading. The categorization of the variables included in the model were not reported.
						Lubrication	All treatments: 58.1% By treatment: RT+CT: 56% CT+HT: 55% CT+RT+HT: 61%	31.0%	PR=1.87 * † By treatment: OR= 4.2 * OR= 4.1 * OR= 6.4 *	95%CI: 1.48-2.38 By treatment: 95%CI: 3.4-8.7 95%CI: 3.2-8.4 95%CI: 4.6-12.6	
						Satisfaction	All treatments: 53.8% By treatment: RT+CT: 50% CT+HT: 53% CT+RT+HT: 59%	29.0%	PR=1.86 * † By treatment: OR= 3.4 * OR= 3.8 * OR= 5.7 *	95%CI: 1.44-2.39 By treatment: 95%CI: 1.8-5.8 95%CI: 2.2-6.1 95%CI: 3.4-11.4	
						Desire	Mean score (95%CI): 3.7 (3.1-4.3) By treatment: RT+CT: 4.4 (3.8-4.7) CT+HT: 3.6 (2.9-4.4) CT+RT+HT: 3.1 (2.6-3.6)	Mean score (95%CI): 4.8 (3.6-5.6)	-	P<0.05 * By treatment: P>0.05 P<0.05 * P<0.05 *	Women who had RT+CT+HT reported more sexual dysfunction problems than women who had RT+CT for all domains, and more impairments than women who had CT+HT for arousal, lubrication, satisfaction and pain.
						Arousal	4.0 (3.3-4.3) By treatment: RT+CT: 4.4 (3.6-4.6) CT+HT: 4.3 3.6-4.6() CT+RT+HT: 3.3 (2.7-3.7)	4.9 (3.5-5.4)	-	P<0.05 * By treatment: P>0.05 P>0.05 P<0.05 *	
						Lubrication	2.8 (2.4-3.3) By treatment: RT+CT: 3.1 (2.6-3.6) CT+HT: 3.1 (2.6-3.5) CT+RT+HT: 2.4 (1.9-2.8)	5.1 (3.5-5.8)	-	P<0.05 * By treatment: P<0.05 * P<0.05 * P<0.05 *	
						Orgasm	3.7 (3.1-4.1) By treatment: RT+CT: 4.3 (3.6-4.7) CT+HT: 3.6 (3.1-3.9) CT+RT+HT: 3.2 (2.7-3.6)	4.7 (3.8-5.8)	-	P<0.05 * By treatment: P>0.05 P<0.05 * P<0.05 *	
						Satisfaction	3.3 (2.9-3.7) By treatment: RT+CT: 3.4 (3.0-3.9) CT+HT: 3.5 (3.1-4.0) CT+RT+HT: 2.9 (2.5-3.3)	5.1 (3.7-5.7)	-	P<0.05 * By treatment: P<0.05 * P<0.05 * P<0.05 *	
						Pain	4.6 (3.8-4.7) By treatment: RT+CT: 4.9 (4.5-5.0) CT+HT: 4.4 (4.1-4.6) CT+RT+HT: 3.1 (2.7-3.5)	5.1 (3.8-5.5)	-	P>0.05 By treatment: P>0.05 P<0.05 * P<0.05 *	

Claus et al., 2006 [41] United States	Population-based All 795 women in Connecticut diagnosed with DCIS in 1994-1998, with history of invasive breast cancer	0 (100%)	Srg, C: 35.5% Srg, M: 14.0%	5.8 (1.0), ND	Population based 702 women selected by random-digit-dialling methods, with no history of DCIS or invasive breast cancer; frequency matched by age (± 5 years) and geography.	Scale: MOS-SFS, Lack of interest	Prevalence: 27.9% By treatment: Srg, C: 25.6% Srg, C + RT: 31.0% Srg, M: 22.6%	Prevalence: 22.3%	PR= 1.25 * † By treatment: PR= 1.15 † PR= 1.39 * † PR= 1.01 †	95%CI: 1.05-1.49 By treatment: 95%CI: 0.90-1.46 95%CI: 1.14-1.70 95%CI: 0.70-1.47	Cut-off for case: "somewhat of a problem" or "very much of a problem".
						Unable to relax	Prevalence: 19.2% By treatment: Srg, C: 20.1% Srg, C + RT: 18.6% Srg, M: 18.7%	Prevalence:12.8%	PR=1.50 * † By treatment: PR= 1.57 * † PR= 1.45 * † PR= 1.46 †	95%CI: 1.16-1.91 By treatment: 95%CI: 1.16-2.12 95%CI: 1.10-1.93 95%CI: 0.95-2.25	
						Difficulty with arousal	Prevalence: 23.0% By treatment: Srg, C: 25.6% Srg, C + RT: 22.3% Srg, M: 18.7%	Prevalence:15.2%	PR=1.51 * † By treatment: PR= 1.68 * † PR= 1.47 * † PR= 1.23 †	95%CI: 1.22-1.88 By treatment: 95%CI: 1.29-2.19 95%CI: 1.14-1.89 95%CI: 0.80-1.87	
						Difficulty with orgasm	Prevalence: 20.4% By treatment: Srg, C: 21.3% Srg, C + RT: 20.8% Srg, M: 16.8%	Prevalence:14.8%	PR=1.38 * † By treatment: PR= 1.44 * † PR= 1.41 * † PR= 1.14 †	95%CI: 1.10-1.73 By treatment: 95%CI: 1.08-1.92 95%CI: 1.08-1.83 95%CI: 0.72-1.78	
Broeckel et al., 2002 [40] United States	Convenience sample 58 breast cancer survivors who had a spouse or partner, free of recurrence for >5 years, with no known neurological disorder, and no history of other cancer.	I (26%) II (62%) III (10%) Unknown (2%)	Srg, C: 50% Srg, M: 47% CT: 100% RT: 71% HT: 48%	7.7 (2.3), 5.2-15.2	Convenience sample 61 women with no history of cancer who had a spouse or partner, recruited among the friends of the women who had breast cancer; individual matching for age (± 6 years).	Scale: MOS-SFS	Mean score (SD):	Mean score (SD):	-	P≤0.01 *	Sexual dysfunction positively correlated with vaginal dryness in breast cancer survivors.
						Overall	1.95 (1.05)	1.50 (0.70)			
						Interest	2.06 (1.16)	1.67 (0.83)	-	P≤0.05 *	
						Enjoyment	1.72 (0.94)	1.38 (0.74)	-	P≤0.01 *	
						Arousal	1.87 (1.08)	1.40 (0.83)	-	P≤0.01 *	
						Orgasm	1.78 (1.01)	1.44 (0.80)	-	P≤0.05 *	
Rubino et al., 2007 [10] Italy	Convenience sample 33 consecutive patients who had had breast-reconstruction after mastectomy, in 2001-2002, in one hospital.	ND	Srg, M: 100% Srg, R: 100%	ND (ND), >1	Convenience sample 33 healthy women, randomly selected amongst the personnel of the local university.	Psychiatric interview	Prevalence: 18.5%	Prevalence: 9.1%	PR=2.03 †	95%CI: 0.19-21.26	-

Vazquez-Ortiz et al., 2010 [104] Spain	Convenience sample 30 women aged 25-59 years who had mastectomy ≥1 year ago, were free of disease, in a stable heterosexual relationship, able to read and write and with no psychological or psychiatric treatment in the last 10 years, recruited from hospitals.	I (13.3%) II (60.0%) III-A (26.7%)	Srg, M: 100%	ND (ND), 2-5	Convenience sample 30 women without breast cancer aged 25-59, assistants to talks and workshops about woman's health, who did not have an incapacitating or severe disease.	Scale: SAI-E Arousal	Mean score (SD): 68.5 (23.9)	Mean score (SD): 72.6 (23.7)	-	P=0.690	-
						Scale: SAI-E Satisfaction	Mean score (SD): 72.3 (23.3)	Mean score (SD): 76.9 (23.9)	-	P=0.524	
						Scale: WSQ					
						Sex frequency per month: 0	10.0%	3.3%	PR=3.33 †	95%CI: 0.33-33.27	
						1-3	20.0%	13.3%	PR=1.50 †	95%CI: 0.47-4.80	-
						4-6	33.3%	30.0%	PR=1.11 †	95%CI: 0.53-2.34	
						7-9	13.3%	20.0%	PR=0.67 †	95%CI: 0.21-2.12	
						>9	23.3%	33.3%	PR=0.70 †	95%CI: 0.31-1.59	
						Orgasm frequency during sex					
						Never (0%)	7.1%	3.3%	PR=2.15 †	95%CI: 0.21-22.11	
						Sometimes (1-29%)	14.3%	10.0%	PR=1.43 †	95%CI: 0.36-5.72	-
						Often (30-58%)	17.9%	23.3%	PR=0.77 †	95%CI: 0.28-2.10	
						Most of the time (60-89%)	21.4%	16.7%	PR=1.28 †	95%CI: 0.45-3.67	
						Almost always (90-100%)	39.3%	46.7%	PR=0.84 †	95%CI: 0.47-1.51	

BC = breast cancer; CT = chemotherapy; FSFI = Female Sexual Functioning Index [105];
HT = hormone therapy; MOS-SFS = MOS Sexual Functioning Scale [106]; ND = not defined; PR = prevalence ratio; RT = radiotherapy; SAI-E = Sexual Arousal and Satisfaction Scale - Expanded [107]; SD = standard deviation; Srg, C = Breast conserving surgery; Srg, M = Mastectomy; Srg, R = Breast reconstructive surgery; WSQ = Women's Sexuality Questionnaire [108].

* There was some statistical evidence (P<0.05) for a different prevalence, risk or severity of anxiety between breast cancer survivors and women who did not have cancer.

† Prevalence ratio calculated by the authors of the present study.

Supplementary Table 7. Other outcomes: characteristics and results of the studies that provided data on the frequency and/or severity of bipolar disorders, obsessive-compulsive problems, post-traumatic stress, sleep-wake disturbances, somatization and suicide in breast cancer survivors (>1 year) and women who did not have cancer.

First author, year of publication Country	Breast cancer survivors				Comparison group	Outcome assessment	Prevalence / cumulative incidence of the outcome		Relative risk estimate (RR, OR, SIR, PR)	P-value or 95% confidence interval	Notes
	Type of population and main characteristics	Stage at diagnosis (%)	Breast cancer treatments (%)	Time since diagnosis/ treatment in years: mean/ median (SD), range	Type of population and main characteristics		Breast cancer survivors	Comparison group			
Bipolar disorder											
Hung et al., 2013 [2] Taiwan	Population-based 26,629 women with no prior mood disorder and cancer, with primary breast cancer registered in the National Health Insurance Database in 2000-2005.	All	ND	2.7 (ND), ND-7 (median follow up years for breast cancer survivors: 2.7; for matched cohort: 3.21)	Population-based 26,629 women randomly selected from 1 million women with no history of breast cancer in the same database; individual matching for age and Charlson comorbidity score (categories of matching not reported).	EHR, recorded in the Registry for Catastrophic Illness with an ICD-9-CM code for anxiety (ICD-9-CM codes: 296.0X-296.1X, 296.4X-296.8X)	Cumulative incidence: 0.3%	Cumulative incidence: 0.1%	RR=2.06 *	95%CI: 1.37-3.15	Approximate cumulative incidence values estimated from the graphics provided in the original study. P value for the log-rank test comparing the Kaplan-Meier curves: P<0.001
				2			0.3%	0.1%	RR=3.0 * †	95%CI: 2.56-3.39	
				4			0.4%	0.2%	RR=2.0 * †	95%CI: 1.82-2.19	
				6			0.6%	0.3%	RR=2.0 * †	95%CI: 1.86-2.16	
Obsessive-compulsive problems											
Amir et al., 2002 [13] Israel	Convenience sample 39 women free of cancer symptoms for ≥3 years and not under active treatment, identified in 2 hospitals.	I (46%) II (46%) III (8%)	Srg, C: 20% Srg, M: 80% CT: 66% RT: 41% HT: 46%	6.5 (ND), ≥5	Convenience sample 39 women without any life-threatening disease, recruited by unknown methods; matched for age and education; matched for age and education (method of matching not reported).	Scale: SCL-90	SCL-90 mean score (SD): 0.92 (0.70)	SCL-90 mean score (SD): 0.68 (0.42)	-	P<0.001 *	Higher SCL-90 scores indicate more obsessive-compulsive symptoms. Women who had breast cancer and PTSD symptoms had more obsessive-compulsive problems than those who did not have PTSD symptoms (P<0.01).
Post-traumatic stress											
Gurevich et al., 2004 [109] Canada	Convenience sample 66 women with a good working knowledge of English ≥1 year post breast cancer treatments with negative mammography before.	Local (61%) Regional (30.5%) Distant (2%) Unknown (11%)	Srg: 96.6% CT: 48% RT: 71% HT: 48%	6.6 (4.5), ≥1	Convenience sample 69 'healthy' women undergoing surveillance mammography in the same hospital.	Scale: SASRQ	SASRQ mean scores (SD): Dissociative: 1.07 (1.05) Re-experiencing: 1.23 (1.25) Avoidance: 1.34 (1.21) Arousal: 1.96 (1.40) Impairment: 1.29 (1.30) Total acute stress: 1.37 (1.05)	SASRQ mean scores (SD): 0.45 (0.80) 0.58 (0.95) 0.83 (1.17) 1.00 (1.21) 0.66 (1.10) 0.69 (0.91)	-	P<0.0001 * P<0.001 * P<0.02 * P<0.0001 * P<0.003 * P<0.0001 *	-

Voigt et al., 2016 [110] Germany	Convenience sample 150 women aged 18-65 years, newly diagnosed with breast cancer at recruitment, with no history of psychotic disorders	0 (7%) I (42%) II (41.4%) IIIc (%9.6)	Srg, M: 26% Srg, C: 74% CT: 58%	~ 1	Convenience sample 56 women aged 18-65 years, who never had cancer, who attended the same institution as cases for breast imagining and did not require further tests	SCID, number of PTSD symptoms	Prevalence of PTSD related to BC: 2.0% Prevalence of PTSD related to stressors other than BC: 0.7%	Prevalence of PTSD related to stressors other than BC: 0%	PR= 1.51 †	95%CI: 0.17-13.20	Mean number of PTSD symptoms (SD) in breast cancer survivors: 1.7 (2.3); significantly different from the mean number of symptoms in controls (P<0.001).
Yang et al., 2017 [4] Sweden	Population based All 40,849 women diagnosed with an invasive breast cancer at the age of 20-80 years between 2001-2009	I-IV	ND	4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for stress-related disorders (F430-2, F438-9) at in patient or outpatient hospital visits	Cumulative incidence: 0.9%	Cumulative incidence: 0.5%	SIR= 1.77 * By age group: 20-44: SIR= 1.68 * 45-54: SIR= 1.78 * 55-64: SIR= 1.89 * 65-80: SIR= 1.64 *	95%CI: 1.60-1.95 By age group: 95%CI: 1.36-2.08 95%CI: 1.52-2.09 95%CI: 1.56-2.28 95%CI: 1.23-2.19	Standardised incidence ratios were standardised by calendar period (1-year categories), age (5-year categories), and region of residence (North, Stockholm-Gotland, South, Southeast, Uppsala-Orebro, West).
				0-0.5			-	-	SIR= 4.22 *	95%CI: 3.44-5.19	
				0.5-1			-	-	SIR= 2.73 *	95%CI: 2.11-3.52	
				1-2			-	-	SIR= 1.72 *	95%CI: 1.36-2.17	
				2-5			-	-	SIR= 1.36 *	95%CI: 1.14-1.63	
				5-10			-	-	SIR= 0.98	95%CI: 0.73-1.32	
	Population based All 40,849 women diagnosed with an invasive breast cancer at the age of 20-80 years between 2001-2009	0	ND	4.5 (4.5), 0-10 (median (IQR) duration of follow up: 4.4 (4.5))	Population based 452,507 women randomly selected from the respondents to the 1990 census	EHR, ICD-10 diagnostic codes for stress-related disorders (F430-2, F438-9) at in patient or outpatient hospital visits	Cumulative incidence: 0.6%	Cumulative incidence: 0.5%	SIR= 1.02 By age group: 20-44: SIR= 0.38 45-54: SIR= 1.06 55-64: SIR= 1.46 65-80: SIR= 1.15	95%CI: 0.70-1.50 By age group: 95%CI: 0.09-1.51 95%CI: 0.60-1.87 95%CI: 0.76-2.81 95%CI: 0.37-3.56	
				0-0.5			-	-	SIR= 2.76 *	95%CI: 1.31-5.79	
				0.5-1			-	-	SIR= 0.78	95%CI: 0.20-3.14	
				1-2			-	-	SIR= 1.04	95%CI: 0.43-2.51	
				2-5			-	-	SIR= 0.88	95%CI: 0.46-1.69	
				5-10			-	-	SIR= 0.57	95%CI: 0.18-1.76	
Sleep-wake disturbances											
Ancoli-Israel et al., 2014 [33] United States	Convenience sample 44 women who had been newly diagnosed with breast cancer 1 year before, and scheduled to receive ≥4 cycles of CT, with no psychological impairments and not receiving RT at recruitment.	I (27.9%) II (39.7%) III (30.9%) Unknown (1.5%)	Srg, C: 45.6% Srg, M: 49.7% CT: 100%	~ 1 (follow up at 1 year after CT)	Convenience sample 35 cancer-free friends of the women who had breast cancer, or 'volunteers', with no psychological impairments at the time of recruitment individual matching for age (±5 years), ethnicity and education (categories of ethnicity and education not reported).	Nocturnal total sleep time	Mean time (SD), hours: 7.01 (0.74)	Mean time (SD), hours: 7.07 (0.66)	-	P>0.05	Sleep measure by wrist activity, using an actigraph during 72 consecutive hours.
						Daytime total nap time	Mean time (SD), hours: 0.49 (0.47)	Mean time (SD), hours: 0.36 (0.44)		P=0.63	
						Scale: PSQI	PSQI mean scores (SD): 7.4 (ND)	PSQI mean scores (SD): 5.0 (ND)	-	P=0.02 *	

El Rafihi-Ferreira et al., 2011 [111] Brazil	Convenience sample 50 women with a previous diagnosis of breast cancer without encephalopathies or severe psychiatric disorders. Patients were all disease free at enrolment.	I-II (100%)	Srg, ND: 40% CT: 66% RT: 54% HT: 77%	3.8 (2.8), 1-10	Convenience sample 50 women without a previous cancer diagnosis, encephalopathies or severe psychiatric disorders.	Scale: PSQI	Prevalence:40%	Prevalence: 50%	PR=0.8 †	95%CI: 0.52-1.24	Cut-off for case: score >5
						Cannot get to sleep in 30 min	Prevalence: 42%	Prevalence: 38%	PR= 1.1 †	95%CI: 0.68-1.79	Cut-off for case: reported problems three or more times a week. Worse sleep quality associated with poorer quality of life for the social domain, and domains of physical and psychological health (P<0.05). Women who had had breast cancer and had worse quality of sleep reported higher depressive symptomatology compared to those with good quality of sleep (SDS mean scores 20.8 (7.12) vs. 16.6 (3.76), P<0.05).
						Wake up in the middle of the night or early morning	40%	22%	PR= 1.82 †	95%CI: 0.98-3.39	
						Get up to use the bathroom	52%	26%	PR= 2.0 * †	95%CI: 1.17-3.43	
						Cannot breathe comfortably	8%	8%	PR= 1.0 †	-	
						Cough or snore loudly	16%	16%	PR= 1.0 †	-	
						Feel too cold	4%	6%	PR= 0.67 †	95%CI: 0.12-3.82	
						Feel too hot	36%	14%	PR= 2.57 * †	95%CI: 1.18-5.61	
						Pain	14%	20%	PR= 0.70 †	95%CI: 0.29-1.69	
						Sleep medication	12%	16%	PR= 0.75 †	95%CI: 0.28-2.00	
						Daytime sleepiness	2%	4%	PR= 0.50 †	95%CI: 0.05-5.34	
						<6h of sleep	18%	14%	PR= 1.29 †	95%CI: 0.52-3.18	
Otte et al., 2010 [43] United States	Convenience sample 246 breast cancer survivors free of cancer at recruitment, with no history of other cancers and able to speak, read and write English	I (ND) II (ND) III (ND)	Srg, C: 42% Srg, M: 59% CT: 89% RT: ND HT: 33%	5.6 (2.0), 2-10	Convenience sample 246 women in general good health with no history of breast cancer recruited by acquaintance referral, self-referral or from corporative group; individual matching for age (±5 years).	Scale: PSQI Overall score	PSQI mean scores (SD): 7.31 (3.80)	PSQI mean scores (SD): 5.80 (3.45)	-	P<0.01 *	Adjusted for race (minority vs. not minority) and menopausal status (pre or post menopausal). Determinants sleep-wake disorders in women who had breast cancer: race other than Caucasian, having hot flashes, poor physical functioning and depression.
						Sleep quality	1.20 (ND)	0.85 (ND)	-	P<0.01 *	
						Sleep latency	1.39 (ND)	1.00 (ND)	-	P<0.01 *	
						Sleep disturbance	1.50 (ND)	1.31 (ND)	-	P<0.01 *	
						Sleep medication	0.65 (ND)	0.61 (ND)	-	P=0.70	
						Sleep efficiency	0.59 (ND)	0.57 (ND)	-	P=0.77	
						Sleep duration	0.98 (ND)	0.84 (ND)	-	P=0.03 *	Adjusted for race.
						Daytime dysfunction	0.96 (ND)	0.70 (ND)	-	P<0.01 *	-
Dahl et al., 2011 [8] Norway	Convenience sample 337 tumor free breast cancer survivors treated with radiotherapy during 1998 and 2002 in one hospital.	II (ND) III (ND)	Srg, C: 24% Srg, M: 76% CT: 82% RT: 100% HT: 81%	3.9 (ND), 2.6-6.9	Convenience sample 1,685 women randomly selected from a population-based sample of women with no history of cancer whose questionnaires had complete data; matched individual matching for age (± 5 years).	Prevalence of regular use of hypnotics	Prevalence: 15%	Prevalence: 4%	PR=3.75 * †	95%CI: 2.65-5.30	Adjusted for level of education, on disability pension and menopausal status.

Von Ah et al., 2012 [45] United States	Convenience sample 62 non-Hispanic African American women diagnosed with non-metastatic breast cancer and able to read and write English, recruited by medical record review and by self-referral.	I-IIB (85.7%) IIIB (14.3%)	Srg, C: 0% Srg, M: 60.3% CT & RT: 54.6% HT: ND	5.0 (2.7), 2-10	Convenience sample 78 African American women with no history of breast cancer, recruited through community advertisements and events.	Scale: PSQI	PSQI mean scores (SD): 9.0 (4.2)	PSQI mean scores (SD): 6.1 (4.0)	-	P=<0.001 *		Mean scores adjusted for age, income, years of education and body mass index.
Somatization												
Cohen et al., 2011 [5] Israel	Convenience sample 56 married Israeli Arab breast cancer survivors, post treatment and free of disease recruited from one hospital.	I-III (ND%)	Srg, C: 48.2% Srg, M: 51.8% Srg, R: 12.5% CT: 85.7% RT: 85.7% HT: 58.9%	4.8 (4.2), 1-17	Convenience sample 66 married and 'healthy' Arab women living in northern Israel, approached in community settings; individual matching for age and education (matching categories not reported).	Scale: BSI-18	BSI-18 mean score (SD): 2.6 (1.2)	BSI-18 mean score (SD): 1.8 (0.8)	-	P<0.001 *		More somatic symptoms in breast cancer survivors were associated with lower education, religiosity, depression, anxiety, emotional distress and lower body image (P<0.05).
Amir et al., 2002 [13] Israel	Convenience sample 39 women free of cancer symptoms for ≥3 years and not under active treatment, identified through two hospitals.	I (46%) II (46%) III (8%)	Srg, C: 20% Srg, M: 80% CT: 66% RT: 41% HT: 46%	6.5 (ND), ≥5	Convenience sample 39 women who did not experience any life-threatening disease, recruited by unknown methods; matched for age and education (method of matching not reported).	SCL-90	SCL-90 mean score: 0.92 (0.86)	SCL-90 mean score: 0.51 (0.47)	-	P<0.001 *		Higher SCL-90 scores indicate more somatic symptoms. Women who had breast cancer and reported PTSD symptoms had more somatic symptoms than women who did not have PTSD symptoms: 1.61 (1.06) vs. 0.77 (0.60), P<0.01.
Suicide												
Schairer et al., 2006 [112] Denmark, Finland, Norway, Sweden, United States (continues)	Population based 723,810 one-year breast cancer survivors diagnosed between 1953 and 2001.	All	ND	8.7 (ND), 1-49 (mean follow up duration: 7.7 years, range <1 month to 49 years)	Population-based General female population in each of the countries	Official mortality databases in each country. ICD-7 codes: E963 and E970 - 979; ICD-8 and ICD-9: E950 - E959; and ICD-10: X60 - X84.	Incidence rate: 1.5 per 10,000 person-years Cumulative incidence of suicide by time since diagnosis: 5 yrs: 0.05% 10 yrs: 0.10% 20 yrs: 0.16% 30 yrs: 0.20%	Incidence rate: 1.09 per 10,000 person-years	SIR= 1.37 * By country US: SIR= 1.49 * Sweden: SIR= 1.27 * Denmark: SIR= 1.25* Finland: SIR= 1.53 * Norway: SIR= 1.40 * By calendar period 1953-59: SIR=1.86* 1960-69: SIR=1.72* 1970-79: SIR=1.31* 1980-89: SIR=1.29* 1990-2001: SIR=1.36*	95%CI: 1.28-1.47 By country 95%CI: 1.32-1.70 95%CI: 1.12-1.45 95%CI: 1.07-1.46 95%CI: 1.28-1.83 95%CI: 1.07-1.81 By calendar period 95%CI: 1.20-2.78 95%CI: 1.42-2.07 95%CI: 1.15-1.49 95%CI: 1.15-1.46 95%CI: 1.18-1.57	- - -

Schairer et al., 2006 [112] Denmark, Finland, Norway, Sweden, United States (continued)	Population based 723,810 one-year breast cancer survivors diagnosed between 1953 and 2001.	All	ND	8.7 (ND), 1-49	Population-based General female population in each of the countries	Official mortality databases in each country. ICD-7 codes: E963 and E970 - 979; ICD-8 and ICD-9: E950 - E959; and ICD-10: X60 - X84.	Incidence rate: 1.5 per 10,000 person-years Cumulative incidence of suicide by time since diagnosis: 5 yrs: 0.05% 10 yrs: 0.10% 20 yrs: 0.16% 30 yrs: 0.20%	Incidence rate: 1.09 per 10,000 person-years	By race White: SIR=1.36 * Black: SIR=2.88 * Other: SIR=1.02	By race 95%CI: 1.27-1.46 95%CI: 1.44-5.17 95%CI: 0.44-2.01	-
									By age <40: SIR=1.34 * 40-49: SIR=1.42 * 50-59: SIR=1.50 * 60-69: SIR=1.26 * ≥70: SIR=1.24 *	By age 95%CI: 1.24-1.62 95%CI: 1.32-1.71 95%CI: 1.09-1.47 95%CI: 1.04-1.48 95%CI: 1.24-1.62	-
									By time since diagnosis, years 1: SIR=1.51 * 2: SIR=1.49 * 3: SIR=1.57 * 4: SIR=1.31 * 5-9: SIR=1.30 * 10-14: SIR=1.28 * 15-19: SIR=1.25 20-24: SIR=1.32 ≥25: SIR=1.35	By time since diagnosis, years 95%CI: 1.25-1.82 95%CI: 1.22-1.82 95%CI: 1.27-1.93 95%CI: 1.02-1.66 95%CI: 1.14-1.49 95%CI: 1.07-1.54 95%CI: 0.95-1.62 95%CI: 0.89-1.90 95%CI: 0.82-2.12	
									By stage at diagnosis Local: SIR=1.38 * Regional: SIR=1.55* Distant: SIR=2.11 * Unknown: SIR=1.05*	By stage at diagnosis 95%CI: 1.24-1.53 95%CI: 1.34-1.79 95%CI: 1.16-3.55 95%CI: 0.73-1.50	Includes only patients from the US, Demark, Finland and Norway.
									By treatment Surgery only SIR= 1.40 * Radiotherapy, no chemotherapy SIR= 1.46 * Chemotherapy, no radiotherapy SIR= 1.12 Radiotherapy and chemotherapy SIR= 1.50 * Other/none/unknown SIR= 1.84 *	By treatment 95%CI: 1.24-1.58 95%CI: 1.27-1.67 95%CI: 0.80-1.55 95%CI: 1.09-2.02 95%CI: 1.14-2.96	Refers to initial course of treatment only; Includes only patients from the US, Demark, Finland and Norway.
									Breast conserving surgery SIR= 1.22 Radical mastectomy SIR= 1.30 *	 95%CI: 0.89-1.64 95%CI: 1.04-1.63	US women only, 1983-2001.

Fang et al., 2012 [113]	Population based 74,977 women diagnosed with primary breast cancer between 1991 and 2006	All	ND	>1 (Mean follow up time of the all cancer cohorts was 4.07 years (median 2.65, range 0 to 15.99)	Population based Women not diagnosed with cancer during follow up.	ICD-9 codes E950–E959 and ICD-10 codes X60–X84 and Y870	-	-	RR= 1.6 *	95%CI: 1.2-2.1	RR adjusted for age at follow-up (≤49 years, 5-yr groups for 50 to 74 yrs, ≥75 yrs), calendar period at follow-up (5-year groups), civil status (cohabitation or non-cohabitation), socioeconomic status (blue-collar, white-collar, self-employed, or unclassified), and education (≥9 years, <9 years, or missing).

BC = breast cancer; BSI-18 = Brief Symptom Inventory-18 [22]; CT = chemotherapy; EHR = electronic health records; HT = hormone therapy; ICD-9-CM = The International Classification of Diseases, Ninth Revision, Clinical Modification; IRR = incidence rate ratio; ND = not defined; PR = prevalence ratio; PSQI = Pittsburgh Sleep Quality Index [114]; RR = relative risk; RT = radiotherapy; SASRQ = Stanford Acute Stress Reaction Questionnaire [115]; SCL-90 = Somatization subscale of Symptoms Checklist-90 [27]; SD = standard deviation; Srg, C = Breast conserving surgery; Srg, M = Mastectomy.

* There was some statistical evidence (P<0.05) for a different prevalence, risk or severity of anxiety between breast cancer survivors and women who did not have cancer.

† Prevalence ratio calculated by the authors of the present study.

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