The psychosocial determinants of quality of life in breast cancer survivors: a scoping review

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Abstract

Background: Breast cancer care today involves state-of-the-art biomedical treatment but can fail to address the broader psychosocial and quality-of-life (QoL) issues associated with the transition to breast cancer survivorship. This scoping review examines the evidence on the influence of psychosocial determinants on QoL in breast cancer survivors.

Methods: Scoping review methodology was used to: (1) identify the research question(s); (2) identify relevant studies; (3) undertake study selection; (4) extract data; (5) collate, summarise and report the results.

Results: A total of 33 studies met the inclusion criteria. The majority of studies were conducted in the US (n=22, 67%) and were mainly cross-sectional (n=26, 79%). Sixteen psychosocial determinants of QoL were identified. Social support (n=14, 42%), depression (n=7, 21%) and future appraisal and perspective (n=7, 21%) were the most frequently investigated determinants. Twelve different QoL measures were used. A range of different measurement tools were also used per psychosocial determinant (weighted average = 6). The 14 studies that measured the influence of social support on QoL employed 10 different measures of social support and 7 different measures of QoL. In general, across all 33 studies, a higher level of a positive influence and a lower level of a negative influence of a psychosocial determinant was associated with a better QoL e.g. higher social support and lower levels of depression were associated with a higher/better QoL. For some determinants such as spirituality and coping skills the influence on QoL varied, but these determinants were less commonly investigated.

Conclusion: Consensus around measures of QoL and psychological determinants would be valuable and would enable research to determine the influence of psychosocial determinants on QoL adequately. Research in other healthcare settings beyond the US is required, in order to understand the influence of organisation and follow-up clinical and supportive care on psychosocial determinants and QoL and to improve the quality of care in breast cancer survivors.

Keywords: Breast cancer, Survivorship, Quality of life, Psychosocial, Scoping review
Background
In recent years, with earlier diagnosis and better treatment options, breast cancer survival in women has increased steadily and 5-year net survival in high income countries is now 85–90% [1]. This means that millions of women worldwide are now living with, and beyond, a breast cancer diagnosis; the 5-year prevalence of breast cancer is approximately seven million globally [2, 3]. The concept of breast cancer survivorship encompasses the wider physical, psychological, social and economic issues of breast cancer [4, 5]. The transition from breast cancer patient to breast cancer survivorship brings numerous uncertainties for women [6]. The end of hospital-focused cancer treatment typically includes the loss of the safety net of active medical treatment, a resumption or alteration of former roles within and outside the home, a decline in interpersonal support and ongoing physical and psychological effects of diagnosis and treatment, such as fatigue, sleep disturbance, sexual dysfunction, urinary/bowel problems, and cognitive problems [7, 8]. However, while breast cancer care today often provides state-of-the-art biomedical treatment, it can fail to address the broader psychosocial and quality-of-life (QoL) issues associated with survivorship [9].

Psychosocial factors have been defined as any exposure that may influence a physical health outcome through a psychological mechanism [10]. Psychosocial factors can include depression and other emotional problems, psychological traits and disruptions in the social environment, all of which can compromise the effectiveness of health care and adversely impact breast cancer survivors’ return to good health [9]. Major depression, for example, is substantially more common in people with cancer than the general population and mostly goes untreated in the outpatient setting [11]. There is some evidence that psychosocial factors are associated with impairments in QoL in breast cancer survivors [8]. High social isolation and lack of social support have been reported to be associated with a lower QoL in breast cancer survivors [12]. In contrast, personality attributes such as optimism (i.e. general expectancy for positive outcomes) and use of active coping strategies such as problem solving, identifying benefits in the experience and expressing cancer-related emotions are all associated with greater psychological adjustment and an improved QoL [13].

Some studies have indicated that breast cancer survivors have a significantly lower QoL, including lower physical, functional, emotional and social well-being compared to control-matched healthy populations and experience clinically relevant restrictions in several QoL dimensions 10 years after diagnosis, with restrictions in role, cognitive and social functioning and fatigue increasing over time [12, 14]. While other studies have found that 10 years after diagnosis, many women report having a new meaning to their lives and healthier lifestyles, with long-term survivors having similar or improved QoL levels when compared to age-matched controls who have never had breast cancer [15, 16]. To inform survivorship care planning, it would be valuable to better understand which psychosocial factors are associated with improved or worsened QoL in breast cancer survivorship. Such an understanding would inform evidence-based psychosocial care and enable the development of targeted interventions to enhance QoL and reduce long term psychological and physical morbidity [6, 17]. This scoping review, therefore, examines the evidence on the influence of psychosocial determinants on QoL in breast cancer survivors.

Methods
This scoping review seeks to identify the current literature published in this field, examine how the research was conducted and identify the key factors related to this topic and gaps in knowledge [18]. The scoping review framework of Arksey and O’Malley [19] and later advanced by Levac, Colquhoun [20] was used to guide the current study. This framework includes five stages: (1) identifying the research question(s); (2) identifying relevant studies; (3) study selection; (4) data extraction; (5) collation, summarising and reporting the results [19].

Identifying the research question
This scoping review was developed to describe the nature, number and scope of published research articles measuring the association between psychosocial determinants and QoL in breast cancer survivors.

Identifying relevant studies
A systematic literature search of the databases, PubMed, Embase, PsyCINFO, and CINAHL was conducted of all articles published between 01/01/1998 and 31/12/2018. The electronic search strategy included MeSH headings, key words and their derivatives “breast cancer, survivor, quality of life” (Appendix). The terms and the search criteria were developed and tested with a medical librarian. All articles were downloaded into Endnote and duplicates were removed.

Study selection
The titles and abstracts of all identified studies were screened by an independent team of reviewers. One reviewer independently applied the inclusion criteria (Table 1) to each abstract and a random sample of 75% of the abstracts were reviewed independently by a second reviewer. The review team met to compare screened abstracts and any differences were resolved through consultation with a third reviewer.
The inclusion criteria were then refined and a more detailed set of criteria was developed for the full text review process (Table 1). The breast cancer survivorship definition was refined to only include women who had completed their hospital-focused breast cancer treatment e.g., women had to be post-surgery, chemotherapy and radiotherapy treatments (if applicable). The criteria for the QoL measure was refined to include only validated measures of overall QoL (e.g. FACT-B, EORTC QLQ-C30) [21, 22]. At least one of the psychosocial determinants measured had to be potentially modifiable (e.g. depression, social support). Two reviewers independently reviewed the full texts of all the identified abstracts using these more detailed inclusion criteria. The reference lists of eligible studies were also reviewed to identify any further studies that had been missed in the electronic searches.

**Data extraction**

After reading the full-texts of each study to be included in the review, two researchers independently extracted the following data: author(s), year of publication, study design, study location, participant characteristics, time period, psychosocial determinant(s) and how they were measured, QoL outcome and how it was measured and the main findings and any adjustments for covariates.

**Collating and summarising the data**

The data from the included studies was collated by both psychosocial determinants and QoL measures to provide both a descriptive and numerical summary of the findings and to answer the following four research questions:

1. What are the main psychosocial determinants of QoL in breast cancer survivors that have been investigated to date?
2. What are the most frequently used measurement tools to assess QoL in breast cancer survivors?
3. Which psychosocial determinants measurement tools were used and how frequently were they used per individual QoL measures?
4. What is the influence of these psychosocial determinants on QoL in breast cancer survivors?

Results

Study population
The study selection process is outline in Fig. 1. The four databases yielded 7516 citations, which reduced to 6071 after removing duplicates. Of these, 58 full-texts were deemed potentially eligible and reviewed in full text. Of these, 33 studies were eligible for inclusion in this scoping review.

The majority of included studies (n = 26, 79%) employed a cross-sectional design; the remaining 7 studies (21%) assessed QoL at various different time points post diagnosis e.g. short term at 6, 12 and 18 months [23, 24], medium term 2–4 years [25–27] and longer term 5–13 years later [13, 28]. Most studies were conducted in the United States (n = 22, 67%), with the remainder from China (n = 3, 9%), Germany (n = 2, 6%), and single studies in Australia, Taiwan, Malaysia, Japan, Korea and Austria respectively. Sample size ranged from 51 to 2671 participants; the average was 418 [29, 30]. The average age of participants was mid-40s to mid-50s, but ranged from 18 years to 96 years. The time period since completing breast cancer treatment varied greatly; some studies assessed the psychosocial determinants of QoL 6 months to 1 year post-treatment [28, 31], while other studies included participants who completed treatment up to 35 years previously [32].

Identifying psychosocial determinants of QoL in breast cancer survivors
The eligible studies reported on 16 possible psychosocial determinants of QoL (Table 2). The most prevalent psychosocial determinants investigated were social support (investigated in 14 studies), depression (7 studies) and future appraisal and perspective (7 studies). Five studies assessed coping, optimism and stress determinants and 4 studies assessed spirituality. Three studies looked at anxiety, confidence and self-efficacy and impact of events. Two studies investigated post-traumatic growth and there were single studies for positive and negative affect, cognitive symptoms, work limitations and health care system factors.

QoL measures
There were 12 different validated QoL outcome measures utilised by the various studies in the scoping review (Table 3). The Functional Assessment of Cancer - Breast Cancer (FACT-B) was the most frequently used QoL measure (13 studies) [23–26, 30, 33, 35, 38, 41, 47–49, 54]. Two studies applied the Functional Assessment of Cancer Therapy – General (FACT-G), without the Breast Cancer Subscale (BC Subscale) [31, 42]. The SF-36 was used in 8 studies [27, 33, 36, 37, 47, 50, 52, 53]. The EORTC QLQ-C30 was used to assess QoL in 6
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|---------------------|--------------|---------|-----------------------------|--------------------------|-------------|----------------------------------|----------------------------------|--------|---------------------|
| Ashing – Giwa K.T., 2010 [33] | Cross-sectional | United States | 703 participants aged 29–91 years (mean = 55, SD = 13); European- (n = 179), African- (n = 135), Latina- (n = 183), and Asian- (n = 206) Americans. 14.4% = < secondary education; 10.8% = completed secondary education; 74.8% = > secondary education | 11.1% = Stage 0 36.7% = Stage 1 38.5% = Stage 2 13.7% = Stage 3 58.5% = Lumpectomy/other; 38.4% = Mastectomy; 15.6% = Mastectomy and reconstruction; 57.8% = Chemotherapy; 66.0% = Radiation | 1–5 years since diagnosis (mean = 3 years) | Medical Outcomes Study (MOS) Social Support Survey | FACT-B: Physical and emotional well-being scale SF-36 -general health perception sub-domain and pain sub-domain | Social support did not have a significant direct relationship with QoL. | Life stress scale, Health care system-patient-doctor relationship, comfort in health care system and diagnostic care delay and sociodemographic variables |
| Carver C.S, 2006 [13] | Longitudinal | United States | 163 women with a mean age of 51.4 (SD = 10.61). 70% = Caucasian, 20% = Hispanic, 10% = African American; 72% were married | 3% = Stage 0 62% = Stage 1 35% = Stage 2 53% = Lumpectomy 47% = Mastectomy 31% = Chemotherapy 50% = Radiation 56% = Tamoxifen 25% = Reconstruction | Recruitment between 1988 and 1995 and 1994–1996 Data collection in 2001. 5–13 years since surgery | Interpersonal Support Evaluation List (ISEL) QLACS | Social support was negatively correlated with lack of positive feelings, pain, sexual impairment, family distress and recurrence distress (subset of 101 participants). Not investigated in multivariate analysis | Optimism, cancer confidence and sociodemographic, clinical and treatment variables |
| Cheng H, 2013 [34] | Cross-sectional | China | 100 Asian/Chinese women aged 37–71 (mean = 53.75, SD = 7.27). 7% = < secondary education; 17% = completed secondary education; 84% were married | 15% = Stage 1 61% = Stage 2 44% = Stage 3 44% = Radiotherapy 75% = Hormonal therapy 60% = Traditional Chinese Medicine | Median number of months since treatment was 44 (IQR = 23–61) | Social Support Questionnaire (SSQ-6) QOL-CS | Participants who had moderate and high levels of social support satisfaction had a significantly better overall QOL as well as better physical psychological and social QoL | Annual household income and length of survivorship |
| DiSipio T et al., 2009 [35] | Cross-sectional | Australia | 323 women. 67% of women were aged ≥50 years. 202 regional based and 121 rural | 61% = Complete local excision 39% = Mastectomy | Recruitment between April 2006–March 2012 post diagnosis | Social Networks Index Supportive Care Needs Survey – Health system and FACT-B | Lack of a confidante was associated with a significantly lower QoL. Lower health care | Amount of stress, perceived handling of stress, overall health self-efficacy |
Table 2 Psychosocial determinants of QoL in breast cancer survivors (Continued)

| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|----------------------------------|----------------------------------|---------|----------------------|
| Dura-Ferrandis E, 2016 [28] | Longitudinal United States | 1280 women aged 65–91 (mean = 77, SD = 9). 88.1% = Caucasian; 11.9% = Non-Caucasian. 42.1% = < or completed secondary education; 57.9% = > secondary education. 55.3% were married. | partial / radical Adjuvant treatment 18% = No treatment 82% = Chemotherapy / Radiotherapy | Recruitment was conducted from January, 2004-April 2011 with follow-up in June 2011. Baseline data was collected nearly 2 months after last surgery. Follow-up data was collected 6 and 12 months after the baseline interview and annually for up to 7 years. | Information needs | Medical Outcomes Study (MOS) Social Support Survey | Higher tangible support decreased the probability of being in accelerated emotional and physical functional decline group versus maintained high emotional and physical functional group. | and sociodemographic and clinical variables |
| Goyal N. G, 2018 [23] | Longitudinal United States | 565 women aged 25–96 (mean = 55, SD = 16). 90% Caucasian; 10% = Non-Caucasian. 63% were college educated 72% were partnered | 52% = Stage 1 40% = Stage 2 8% = Stage 3 36% = Mastectomy 67% = Chemotherapy 72% = Radiation 73% = Hormonal therapy | Baseline data was collected within 8 months of diagnosis. Follow-up data was collected at 6, 12, and 18 months post baseline. | Medical Outcomes Study (MOS) Social Support Survey FACT-B | Those in the “consistently high” QoL trajectory had greater social support compared to all other groups. | Optimism, coping and sociodemographic variables |
| Huang CY. 2013 [36] | Cross-sectional Taiwan | 150 women aged 23–83 (mean = 56, SD = 104). 57% had less than 9 years of education. 77% were married | 13% = Stage 0 27% = Stage 1 46% = Stage 2 75% = Adjuvant treatment | Average duration of treatment was 33 months | Interpersonal Support Evaluation List (ISEL) SF-36 | Appraisal support, self-esteem support and belonging support were significantly associated with physical QoL. Belonging support was also significantly associated with mental QoL. | Depression, coping, spirituality, optimism, illness Intrusiveness Rating Scale and sociodemographic and clinical variables |
| Janz NK, 2014 [26] | Longitudinal United States | 772 women aged on average 59.1 (SD = 13). 47.3% = Caucasian; 16.8% = Black; 36.9% = Latina. 21% = < secondary education; | 55.3% = Stage 1 36.0% = Stage 2 8.7% = Stage 3 40.7% = Mastectomy 57.8% = | Data was taken 9 months post diagnosis. Follow-up occurred 4 years post diagnosis. | Emotional support from others and satisfaction with partner scale FACT-B: Emotional well-being subscale | No association between social support and satisfaction with partner relationship and emotional well-being | Depression, spirituality, appraisal and sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country       | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|-------------|---------------|-----------------------------|--------------------------|-------------|---------------------------------|-----------------------------------|---------|---------------------|
| Lewis, J., 2001 [37] | Cross-sectional | United States | 64 women aged between 30 and 81 years (mean = 59.2, SD = 98); 80% = Caucasian; 20% = African American / Hispanic / Asian / West Indian; 6.5% = < secondary education; 28% = completed secondary education; 65.5% = > secondary education; 66% were married | Lumpectomy | Last treatment ranged from 1 to 15 years prior (mean = 7) | Interpersonal Support Evaluation List (ISEL) – Appraisal subscale | SF-36 | Perceived social support was not associated with physical quality of life but was significantly associated with a better mental quality of life | Impact of Events (Intrusive thoughts) and sociodemographic variables |
| Sammarco, A., 2008 [32] | Cross-sectional | United States | 89 Latina breast cancer survivors with a mean age of 57.35 years (SD = 12.74, range 30–86 years); 65% = Caucasian; 35% = Latina; 7% = < secondary education; 41% = completed secondary education; 52% = > secondary education; 61% were married | Surgery only; 6% = Adjutant only; 77% = Both | Breast cancer treatment was completed between 1 and 35 years prior (mean = 4.99 years, SD = 4.73) | Social Support Questionnaire (SSQ) | QLI-CV | Increased perceived social support was associated with improved QoL | Uncertainty in illness |
| Northouse, LL (1999) [38] | Cross-sectional | United States | 98 African American women aged 29–81 years (mean = 55, SD = 18); Average education was 13 years (SD = 6); 41% were married | Mastectomy | The average time since diagnosis was 6 years (SD = 3). Time since diagnosis ranged from 1 to 15 years | Family APGAR-family functioning | FACT-B | Family functioning was significantly associated with QoL | Optimism, symptom distress, current concerns, appraisal of illness and sociodemographic and clinical variables |
| Pedro L.W. (2001) [39] | Cross-sectional | United States | 62 women aged ≥60 years. Majority were married, retired, white and college-educated | Major surgery or a combination of surgery and radiation | 5 to 10 years beyond initial diagnosis and disease and recurrence free | Norbeck Social Support Questionnaire (NSSQ) | QLI-CV | A statistically significant univariate inverse relation was found between total loss (recent loss, number of individuals lost, and amount of that loss) and Self-esteem and learned resourcefulness | |
### Table 2: Psychosocial determinants of QoL in breast cancer survivors (Continued)

| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|-------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|----------------------------------|---------|-----------------------|
| Edib Z (2016) [40]   | Cross-sectional | Malaysia | 117 women. 13.7% = < 40; 24.8% = 40–49; 61.6% = > 50. 58.1% = Malaysian; 29.9% = Chinese; 12.0% = Indian. 29.1% = < secondary education; 39.3% = completed secondary education; 31.6% = > secondary education. 77.8% were married | 68% = Stage 0 205% = Stage 1 368% = Stage 2 239% = Stage 3 120% = Stage 4 31.6% = Breast Cancer Surgery 684% = Mastectomy 803% = Radiotherapy 71.8% = Chemotherapy 793% = Hormone therapy 226% = Immune therapy | Women were at least 1 year post diagnosis. 42.7% were < 2 years post diagnosis. 42.7% were 2–5 years post diagnosis and 14.6% were > 5 years post diagnosis | Supportive Care Needs Survey- Short Form | EORTC QLQ-C30 | QoL. In multivariate analysis, this relationship was no longer significant. Physical and psychological unmet needs were significantly independently associated with QoL. Sociodemographic and clinical variables |
| Avis N.E. (2005) [41] | Cross-sectional | United States | 202 women between the age of 25 and 50 years (mean 43.5 years). 96% were White. 20.3% = < or completed secondary education; 79.7% = > secondary education. 81% were married/partner | 43.4% = Mastectomy 75.1% = Chemotherapy 69.6% = Radiation therapy | Diagnosed with their first breast cancer in the previous 3 years and were at least 4 months after diagnosis | Cancer Rehabilitation Evaluation System (CARES) | FACT-B Ladder of Life | Relationship problems was negatively associated with FACT-B and overall QoL (Ladder of Life). Coping, sociodemographic and clinical variables |
| Begovic-Juhant, A., 2012 [42] | Cross-sectional | United States | 70 women aged 23–79 (mean = 49.72, SD = 10.62). 65% = Caucasian; 45% = African American; 8% = < secondary education; 41% = completed secondary education; 51% = > secondary education. 84% reported employment | 60% = Mastectomy 27% = Lumpectomy 73% = Chemotherapy 57% = Radiation 36% = Hormone therapy | 67 women were diagnosed between 2005 and 2011, 3 were diagnosed between 1981 and 1999 | Center of Epidemiologic Studies Depression Scale (CES-D) | FACT-G EORTC QLQ-BR23 | Depression was significantly correlated with QoL. Body image, physical attractiveness, and femininity, sociodemographic and clinical variables |
| Cheng A.S.K., 2016 [43] | Cross-sectional | China | 90 women aged between 18 and 60 years. 30 were breast 42.3% = Early Stage 30.8% = Mid | Time since completing treatment was 36 months (SD = 33) | Hospital Anxiety and Depression Scale (HADS) | EORTC QLQ-C30 | There was no significant differences in depression among the groups. Anxiety, cognitive symptoms, work limitations and |
| Primary Author, Year | Study design   | Country     | Participant characteristics | Cancer stage & treatment | Time period          | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results                                      | Covariates (adjusted) |
|----------------------|----------------|-------------|-----------------------------|--------------------------|----------------------|----------------------------------|-----------------------------------|------------------------------------------|-----------------------|
| DeShields, T., 2006  | Longitudinal   | United States | 84 women aged 28–87 (mean = 56, SD = 14). 73% = Caucasian, 27% = African American. | Stage 26.9% = Late Stage 10% = Surgery 13.3% = Radiation 10% = Surgery + Radiation 66.7% = Surgery + Radiation + Chemotherapy | 1 week prior to radiation treatment. 3 and 6 months post treatment | Center of Epidemiologic Studies Depression Scale (CES-D) | FACT-B                                      | At time 1 the Depressed groups demonstrated significantly worse QoL than the Never Depressed group. Findings were similar at Time 2. At Time 3, the Recover group demonstrated equivalent QoL to the Never Depressed group, while the other groups exhibited significantly worse QoL. | Sociodemographic and clinical variables |
| Goyal N. G, 2018     | Longitudinal   | United States | 565 women aged 25–96 (mean = 55, SD = 16). 90% Caucasian; 10% = Non-Caucasian. 63% were college educated; 72% were partnered | Stage 52% = Stage 1 40% = Stage 2 8% = Stage 3 36% = Mastectomy 67% = Chemotherapy 72% = Radiation 73% = Hormonal therapy | Baseline data was collected within 8 months of diagnosis. Follow-up data was collected at 6, 12, and 18 months post baseline | Beck’s Depression Inventory | FACT-B                                      | Those in the “consistently high” QoL trajectory had lower depression compared to all other groups | Social support, coping, spirituality, optimism, Illness Intrusiveness Rating Scale and sociodemographic and clinical variables |
| Simone, S.M. H, 2013 | Cross-sectional | China       | 148 Chinese women aged on average 50.5 (SD = 9.1). 7.4% = no formal education; 27.1% = primary education; 51.3% = secondary education; 14.1% = post-secondary. 76.2% were married/co-habiting | Stage 6.7% = Stage 0 12.3% = Stage 1 43.3% = Stage 2 27.9% = Stage 3 9.7% = Stage 4 92.6% = Surgery 84.0% = Chemotherapy 78.4% = Radiotherapy | Recruitment occurred from 2010 to 2011. Treatment had been completed within that last year | Hospital Anxiety and Depression Scale (HADS) Cantonese/Chinese version | FACT-G                                      | Depression was a significant predictor of physical wellbeing functional wellbeing and social/family wellbeing | Anxiety, sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|---------------------|--------------|---------|-----------------------------|--------------------------|-------------|--------------------------------|--------------------------------|---------|----------------------|
| Janz N.K., 2014 [26] | Longitudinal | United States | 772 women aged on average 59.1 (SD = 13). 47.3% = Caucasian; 16.8% = Black; 36.9% = Latina. 21% = < secondary education; 20.9% = completed secondary education; 58.1% = > secondary education. 55% were married | 47.2% = Hormonal therapy 0.4% = Traditional Chinese medicine | Data was taken 9 months post diagnosis. Follow-up occurred 4 years post diagnosis | Depression history | FACT-B-Emotional well-being (EWB) subscale | Compared with women without a history of depression, women with a history of depression and women with current depression were significantly more likely to report EWB declines | Social support, spirituality, appraisal and sociodemographic and clinical variables |
| Kim, S.H., 2008 [44] | Cross-sectional | Korea | 1933 women aged on average 44 (SD = 9.3). 62.4% = < 50; 37.6% = > 50; 29.3% = < secondary education; 41.3% = completed secondary education; 29.4% = > secondary education. 84.9% were married | 7.9% = Stage 0; 34.3% = Stage 1; 48.8% = Stage 2; 8.9% = Stage 3; 32.9% = Surgery; 67.0% = Mastectomy; 28.6% = Chemotherapy | The average time since surgery was 6 years (SD = 4) | Becks Depression Inventory | EORTC QLQ-C30 EORTC QLQ-BR23 | There were large differences in mean scores (lower scores) for those with depression vs. not for global QOL, emotional functioning, and future perspective scales and smaller mean differences in sexual functioning or sexual enjoyment scores | Fatigue, sociodemographic and clinical variables |
| Akechi, T., 2015 [45] | Cross-sectional | Japan | 146 women aged 27–87 years (mean = 57, SD = 11). 38% > 12 years education. 75% were married | 9% = Stage 0; 49% = Stage 1; 38% = Stage 2; 4% = Stage 3; 99% = Surgery; 35% = Chemotherapy; 1% = Trastuzumab; 71% = Hormonal | February 2006–February 2007. 733–4131 days since diagnosis (mean = 1569, SD = 786) | Hospital Anxiety and Depression Scale (HADS) | EORTC QLQ-C 30 | Anxiety level was significantly correlated with all QOL measures -global health status, physical, role emotional cognitive and social functioning | Depression, perceived needs and sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|-------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|---------------------------------|---------|---------------------|
| Cheng A.S.K., 2016   | Cross-sectional | China  | 90 women aged between 18 and 60 years. 30 were breast cancer survivors, 30 had musculoskeletal conditions, and 30 healthy women. 86.7% = < or completed secondary education; 13.3% = > secondary education. 53.3% were married | 43% = Radiation therapy | 42.3% = Early Stage 30.8% = Mid Stage 26.9% = Late Stage 10% = Surgery 13.3% = Radiation 10% = Surgery + Radiation 66.7% = Surgery + Radiation + Chemotherapy | Time since completing treatment was 36 months (SD = 33) | Hospital Anxiety and Depression Scale (HADS) | EORTC QLQ-C30 | There was no significant differences in anxiety among the groups | Depression, cognitive symptoms, work limitations and sociodemographic and clinical variables |
| Simone, S.M.H., 2013 | Cross-sectional | China  | 148 Chinese women aged on average 50.5 (SD = 9.1). 7.4% = no formal education, 27.1% = primary education, 51.3% = secondary education, 14.1% = post-secondary education. 76.2% were married/co-habiting | 6.7% = Stage 0 12.3% = Stage 1 43.5% = Stage 2 27.9% = Stage 3 9.7% = Stage 4 92.6% = Surgery 110% = Chemotherapy 78.4% = Radiotherapy 47.2% = Hormonal therapy 0.4% = Traditional Chinese medicine | Recruitment occurred from 2010 to 2011. Treatment had been completed within that year | Hospital Anxiety and Depression Scale (HADS)- Cantonese/Chinese version | FACT-G | Anxiety was a significant predictor of physical, functional and emotional wellbeing | Depression and sociodemographic and clinical variables |
| Kessler, T.A. 2002   | Cross-sectional | United States | 148 women aged on average 52.4 years (SD = 11.56). 85% = Caucasian; 11% = African American; 3% = Hispanic; 1% = Other. 5% = < secondary education; 38% = completed secondary education; 57% = > secondary education | 24% = Mastectomy 18% = Mastectomy + Chemotherapy 11% = Mastectomy + Hormone therapy 1% = | Time since diagnosis was between 0.3–19 years (M = 54, SD = 6) | Positive and Negative Affect Scale (PANAS) | QOLM | Positive affect was related positively to QoL and negative affect was related negatively to QoL | Depression and sociodemographic and clinical variables |
| Primary Author, Year | Study  | Country       | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------|---------------|-----------------------------|--------------------------|-------------|---------------------------------|----------------------------------|---------|----------------------|
| Dura-Ferrandis E, 2016 [28] | Longitudinal United States | 1280 women aged 65–91 (mean = 77, SD = 9); 88.1% = Caucasian; 11.9% = Non-Caucasian; 42.1% = < or completed secondary education; 57.9% = > secondary education; 55.3% were married | Mastectomy + Radiation 7% = Lumpectomy + Radiation | Recruitment was conducted from January, 2004 and April 2011 with follow-up in June, 2011. Baseline data was collected nearly 2 months after last surgery. Follow-up data was collected 6 and 12 months after the baseline interview and annually for up to 7 years | Brief COPE | EORTC-QLQ-C30 | The accelerated emotional decline group (vs maintained high) were more likely to use disengagement coping strategies and self-distraction | Social support, Optimism and sociodemographic variables |
| Goyal N. G, 2018 [23] | Longitudinal United States | 565 women aged 25–96 (mean = 55, SD = 16); 90% Caucasian; 10% = Non-Caucasian; 63% were college educated; 72% were partnered | Mastectomy 57% = Hormonal therapy only 43% = Chemotherapy | Baseline data was collected within 8 months of diagnosis. Follow-up data was collected 6, 12, and 18 months post baseline | Brief COPE | FACT-B | Those in the “consistently high” QoL trajectory had lower passive coping scores compared to all other groups | Social support, depression, spirituality, optimism, Illness Intrusiveness Rating Scale and sociodemographic and clinical variables |
| Paek M, 2016 [47] | Cross-sectional United States | 156 women aged on average 55.29 years (SD = 9.69); 55% = Chinese, 45% = Korean; 26.9% = < or completed secondary education; 73.1% = > secondary education; 75% were married | Mastectomy 67% = Chemotherapy 72% = Hormonal therapy 73% = Radiation | There was an average of 349 years since diagnosis (SD = 1.47) | Family Crisis Oriented Personal Scale (FCOPES) FACT-B: Emotional Well-Being subscale SF-36: Vitality subscale | Use of external family coping had a direct positive effect on mental health outcomes whereas internal family coping had no effect | Negative self-image and life stress, family communication strain |
| Paek M, 2016 [25] | Longitudinal United States | 637 women aged 26–97 years (mean = 55, SD = 16); 89.6% = Caucasian; 5.5% = Black; 4.9% = Other; 12.6% = < or completed secondary education; | Mastectomy 57% = Hormonal therapy only 43% = Chemotherapy | Recruitment occurred from 2002 to 2006. Baseline (Time 1) data was taken 1 and 3 months since diagnosis (mean = 5, SD = 3). Time 2 was 12–20 months | Brief COPE | FACT-B | The direct paths from Time 1 negative coping to Time 2 QoL and Time 2 QoL to Time 3 negative coping were both statistically significant. No reciprocal | Sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|-----------------------------------|---------|---------------------|
| Avis N.E. (2005) [41]| Cross-sectional United States | 202 women between the age of 25 and 50 years (mean 43.5 years). 96% were White. 20.3% = < or completed secondary education; 79.7% = > secondary education 81% were married/partner | 64.2% = Lumpectomy 35.8% = Mastectomy | post diagnosis. Time 3 was 18–26 months post diagnosis | Ways of Coping | FACT-B Ladder of Life (overall QoL) | Keeping to self was negatively associated with functional well-being. Positive cognitive restructuring, making change and being prepared was positively associated with QoL. Wishful thinking was negatively associated with QoL | Social support, sociodemographic and clinical variables |
| Carver C.S. et al. 2006 [13]| Longitudinal United States | 163 women with a mean age of 51.4 (SD = 10.61). 70% = Caucasian, 20% = Hispanic; 10% = African American. 72% were married | 3% = Stage 0 62% = Stage 1 35% = Stage 2 53% = Lumpectomy 47% = Mastectomy 31% = Chemotherapy 50% = Radiation 56% = Tamoxifen 25% = Reconstruction | Recruitment between 1988 and 1995 and 1994–1996. Data collection in 2001. 5–13 years since surgery | Question-confidence about remaining cancer free | QLACS | In multivariate analysis confidence was significantly associated with cognitive impairment (subscale of QLACS) | Optimism, social support and sociodemographic, clinical and treatment variables |
| DiSipio T et al. 2009 [35]| Cross-sectional Australia | 323 women. 67% of women were aged ≥50 years. 202 regional based and 121 rural. 54% = < secondary education; 32% = completed secondary education; 14% = > secondary education 77% were married | 61% = Complete local excision 39% = Mastectomy / partial / radical Adjuvant treatment 18% = No treatment 82% = Chemotherapy / Radiotherapy | Recruitment between April 2006 March 2012 post diagnosis | Health efficacy—Self-rated Abilities for Health Practices | FACT-B | Poorer health self-efficacy was associated with a lower QoL | Social support, amount of stress, perceived handling of stress and sociodemographic and clinical variables |
| Pedro L.W. (2001) [39]| Cross-sectional United States | 62 women aged ≥60 years. Majority were married, retired, white | Majority surgery or a combination of 5 to 10 years beyond initial diagnosis and disease and recurrence | Rosenberg Self-Esteem Scale and Rosenbaum Self-Control Schedule | QU-CV | A statistically significant positive correlation was found between self- | Social support |
**Table 2** Psychosocial determinants of QoL in breast cancer survivors (Continued)

| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|---------------------------------|---------|----------------------|
| Goyal N. G, 2018 [23] | Longitudinal United States | 565 women aged 25–96 (mean = 55, SD = 16); 90% Caucasian; 10% Non-Caucasian; 63% were college educated; 72% were partnered | 52% = Stage 1; 40% = Stage 2; 8% = Stage 3; 36% = Mastectomy; 67% = Chemotherapy; 72% = Radiation; 73% = Hormonal therapy | Baseline data was collected within 8 months of diagnosis. Follow-up data was collected at 6, 12, and 18 months post baseline | Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being scale | FACT-B | Those in the “consistently high” QoL trajectory had higher scores on meaning/peace and role of faiths compared to all other groups | Social support, depression, coping, optimism, illness intrusiveness Rating Scale and sociodemographic and clinical variables |
| Janz NK, 2014 [26] | Longitudinal United States | 772 women aged on average 59.1 (SD = 13); 47.3% = Caucasian; 16.8% = Black; 36.9% = Latina; 21% = < secondary education; 20.9% = completed secondary education; 58.1% = > secondary education; 55% were married | 55.3% = Stage 1; 36% = Stage 2; 8.7% = Stage 3; 40.7% = Mastectomy; 57.8% = Lumpectomy; 64.5% = Radiation; 45.2% = Chemotherapy | Data was taken 9 months post diagnosis. Follow-up occurred 4 years post diagnosis | System of Beliefs Inventory (SBI-15R) | FACT-B: Emotional well-being subscale | A higher mean score on the beliefs and practices subscale of Spiritual Beliefs Inventory-15R was associated with emotional decline | Social support, depression, appraisal and sociodemographic and clinical variables |
| Manning-Walsh J, 2005 [48] | Cross-sectional United States | 100 women aged 30–74 years (mean = 45.98, SD = 8.85); 93% = Caucasian; 3% = American Indian; 2% = Hispanic; 2% = Other; 2% = < secondary education; 23% = completed secondary education; 73% = > secondary education; 74% were married | 48% = Stage 1; 41% = Stage 2; 5% = Stage 3; 4% = Stage 4; 2% = Missing; 51% = Mastectomy; 48% = Lumpectomy; 70% = Chemotherapy; 68% = Radiation therapy; 41% = Hormone therapy | Recruitment occurred in 2000. 1–24 months post-surgery | Religious Coping (RCOPE) - negative coping subscale | FACT-B | A negative significant correlation between spiritual struggle and QoL | Social support, depression, coping, optimism, illness intrusiveness Rating Scale and sociodemographic and clinical variables |
| Wildes, K.A. 2009 [49] | Cross-sectional United States | 117 Latina women aged on average 57.2 years (SD = 10.21); 64.1% = 99.1% = Surgery | 92% were diagnosed less than 10 years ago | Systems of Belief Inventory (SBI-15R) | FACT-B | Spirituality was significantly associated with functional | Sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|-------------|---------|-----------------------------|--------------------------|-------------|-----------------------------|----------------------------------|---------|-----------------------|
| Mexican/ American/ Chicano; 1.7% = Central American; 0.9% = Puerto Rican; 0.9% = Cuban; 2.6% = South American; 26.9% = Other Latino/ Hispanic; 3.4% = Other. 35% = < secondary education; 35% = completed secondary education; 30% = > secondary education. 50.4% were married. | 163 women with a mean age of 51.4 (SD = 10.6), 70% = Caucasian, 20% = Hispanic, 10% = African American, 72% were married. | 3% = Stage 0 | Recruitment between 1988 and 1995 and 1994–1996. Data collection in 2001. 5–13 years since surgery. | Life Orientation Test | QLACS | In multivariate analysis optimism was significantly inversely associated with negative feelings, lack of positive feelings, sexual impairment social avoidance, fatigue, lack of benefits, recurrence distress and appearance worries. | Social Support, cancer confidence and sociodemographic, clinical and treatment variables. |
| Carver C.S. et al. 2006 [13] | Longitudinal United States | 1280 women aged 65–91 (mean = 77, SD = 9), 88.1% = Caucasian, 11.9% = Non-Caucasian, 42.1% = < or completed secondary education; 57.9% = > secondary education, 55.3% were married. | 45.6% = Stage 1 | Recruitment was conducted from January, 2004 and April 2011 with follow-up in June, 2011. Baseline data was collected nearly 2 months after last surgery. Follow-up data was collected 6 and 12 months after the baseline interview and annually for up to 7 years. | Life Orientation Test | EORTC QLC-C30 | Those in the accelerated emotional decline group (vs maintained high) were significantly less optimistic. | Social support, coping and sociodemographic variables. |
| Dura-Ferrandis E, 2016 [28] | Longitudinal United States | 565 women aged 25–96 (mean = 55, SD = 16). | 52% = Stage 1 | Baseline data was collected within 8 | Life Orientation Test | FACT-B | Those in the “consistently high” QoL. | Social support, depression, coping, |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|----------------------------------|---------|------------------------|
| Northouse, LL (1999) | Cross-sectional | United States | 98 African American women aged 29–81 years (mean = 55, SD = 18). Average education was 13 years (SD = 6). 41% were married | 90% Caucasian; 10% Non-Caucasian. 63% were college educated. 72% were partnered | 8% = Stage 3 36% = Mastectomy 67% = Chemotherapy 72% = Radiation 73% = Hormonal therapy | months of diagnosis Follow-up data was collected at 6, 12, and 18 months post baseline | OPTIMISMhad higher scores on optimism compared to all other groups (p < 0.001) | Spirituality, Illness Intrusiveness Rating Scale and sociodemographic and clinical variables |
| Petersen LR (2008)   | Cross-sectional | United States | 268 women aged 32–95 years (mean = 71, SD = 11.90) | 109% = Stage 0 63.3% = Stage 1 21.3% = Stage 2 4.5% = Stage 3 | QoL was measured on average 8 years after diagnosis. The mean number of years between completion of MMPI to breast cancer diagnosis was 10 (SD = 8.4) and 18.3 (SD = 9.2) between MMPI and SF-36 completion | The Minnesota Multiphasic Personality Inventory (MMPI) – optimism-pessimism (PSM) scale | Optimism was not significantly associated with QoL | Symptom distress, current concerns, family functioning, appraisal of illness and sociodemographic and clinical variables |
| Sammarco, A, 2008    | Cross-sectional | United States | 89 Latina breast cancer survivors with a mean age of 57.35 years (SD = 12.74, range 30–86 years). 65% = Caucasian; 35% = Latina. 7% = < secondary education; 41% = completed secondary education; 52% = > secondary education. 61% were married | 17% = Surgery only 6% = Adjuvant only 77% = Both | Breast cancer treatment was completed between 1 and 35 years prior (mean = 4.99 years, SD = 47.3) | Mishel Uncertainty in Illness Scale-Community (MUIS-C) | Decreased uncertainty was associated with improved QoL | Social support |
| Northouse, LL (1999) | Cross-sectional | United States | 98 African American women aged 29–81 years (mean = 55, SD = 18). Average education was 13 years (SD = 6). 41% were married | 70% = Mastectomy | The average time since diagnosis was 6 years (SD = 3). Time since diagnosis ranged from 1 to 15 years | Appraisal of Illness Questionnaire | Appraisal of illness mediated the influence of optimism and current concerns and partially mediated the influence of symptom distress on Optimism, symptom distress, current concerns, family functioning, and sociodemographic variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|----------------------------------|---------|-----------------------|
| Farren, A.T, 2010 [51] | Cross-sectional | United States | 104 women aged 28–81 years (mean = 53), 92% were Caucasian, 40% = < or completed secondary education, 60% = > secondary education, 69% were married | The majority of women completed treatment (52%) more than 5 years prior to the study | | Power as Knowing Participation in Change Tool (PKPCT), Mishel Uncertainty in Illness Scale – Community Form (MUSIC), Self-Transcendence Scale (STS) | QLI-CV | 39% of the variance in QoL could be explained by power, uncertainty and self-transcendence when considered together. Uncertainty and self-transcendence made a statistically significant contribution to the explained variance, power did not. | Sociodemographic and clinical variables |
| Janz NK, 2014 [26] | Longitudinal | United States | 772 women aged on average 59.1 (SD = 13), 47.3% = Caucasian; 16.8% = Black; 36.9% = Latina. 21% = < secondary education; 20.9% = completed secondary education; 58.1% = > secondary education; 55% were married | Data was taken 9 months post diagnosis. Follow-up occurred 4 years post diagnosis. | Recurrence information, likelihood and worry about recurrence, decision regret | FACT-B - Emotional well-being subscale | Women who did not receive enough information about the risk of breast cancer recurrence, perceived that their likelihood of breast cancer recurrence was quite/very likely and had higher worry about recurrence (Time 1 to Time 2) were significantly more likely to report emotional decline. No significant differences were observed for decision regret | Social support, depression, spirituality and sociodemographic and clinical variables |
| Koch, L, 2014 [29] | Cross-sectional | Germany | 2671 women aged on average 65 (SD = 9.7), 52% = < secondary education, 48% = completed or > secondary education; 66% were married | Recruitment took place from 2009 to 2010. The mean time since diagnosis was 2 years (ranged 5–16) | Fear of Progression Questionnaire-Short Form | EORTC QLQ-C30-EORTC QLQ-BR23 | Fear of progression was significantly associated with global, physical, functional, social, emotional and cognitive QoL | Sociodemographic and clinical variables |
| Taylor, T.R, 2014 | Cross-sectional | United States | 51 women aged 31–87 | Time since diagnosis | Concerns of | FACT-B | Overall fear of recurrence | | |

Table 2: Psychosocial determinants of QoL in breast cancer survivors (Continued)
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|---------------------|-------------|---------|-----------------------------|--------------------------|-------------|--------------------------------|----------------------------------|---------|---------------------|
| 2012 [30] sectional States (mean = 64, SD = 13). 100% were African American. 13.7% = completed secondary education; 84.3% = > secondary education; 2% = Missing. 35.3% were married | 43.1% = Stage 1 19.6% = Stage 2 98% = Stage 3 45.1% = Breast Cancer Surgery 52.9% = Mastectomy 33.3% = Surgery + Radiation 15.7% = Surgery + Chemotherapy 31.4% = Surgery + Chemotherapy + Radiation 78% = Surgery + Hormone + Other | ranged from 1 to 18 years (mean = 2, SD = 3) | Recurrence Scale was negatively related to QoL | | |
| Ganz P.A. (2003) [52] Cross-sectional United States 577 women aged 30–61.6 years (mean = 49.5). 70.2% = Caucasian; 11.6% = African American; 7.3% = Hispanic; 8.5% = Asian; 2.4% = Other 6.3% = < or completed secondary education; 93.3% = > secondary education. 70.3% were married | 55.8% = Lumpectomy 44.2% = Mastectomy 62% = Adjuvant chemotherapy 37.4% = Tamoxifen | On average 6 years after breast cancer diagnosis | Vulnerability SF-36 general health perceptions scale Ladder of Life | Feeling vulnerable was significantly associated with poorer health perceptions and QoL | Physical and emotional functioning, sociodemographic and clinical variables |
| Impact of Events | Lewis J. 2001 [37] Cross-sectional United States 64 women aged between 30 and 81 years (mean = 59.2 SD = 9.8). 80% = Caucasian; 20% = African American / Hispanic / Asian / West Indian 6.5% = < secondary education 28% = completed secondary education; 65.5% = > secondary education 66% were married | 89% = Chemotherapy / Radiation 71% = Mastectomy 23% = Lumpectomy | Last treatment ranged from 1 to 15 years prior (mean = 7) | Impact of Events Survey (IES)- Intrusion subscale. | SF-36 A higher frequency of intrusive thoughts was associated with poorer physical QoL and mental QoL | Social support and sociodemographic variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|---------------------|-------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|---------------------------------|---------|---------------------|
| Goyal N. G, 2018 [23] | Longitudinal | United States | 565 women aged 25–96 (mean = 55, SD = 16). 90% Caucasian; 10% = Non-Caucasian. 63% were college educated 72% were partnered | 52% = Stage 1 40% = Stage 2 8% = Stage 3 36% = Mastectomy 67% = Chemotherapy 72% = Radiation 73% = Hormonal therapy | Baseline data was collected within 8 months of diagnosis. Follow-up data was collected at 6, 12, and 18 months post baseline | Illness Intrusiveness Rating Scale | FACT-B | Those in the “consistently high” QoL trajectory had lower scores on illness intrusiveness compared to all other groups | Social support, depression, coping, spirituality, optimism and sociodemographic and clinical variables |
| Bouskill K. (2016) [53] | Cross-sectional | Austria | 152 women aged on average 48.78 (SD 8.79). 12% = < secondary education; 46% = completed secondary education; 40% = > secondary education; 2% = Missing. 67% were married/long-term partner | On average women diagnosed 13 years prior to study start date (2001) (SD 3.17) | Impact of Cancer scale SF-36- the physical and the mental component summary | The positive impact of cancer was associated with an increase in physical QoL while the negative impact of cancer was associated with a decrease in physical QoL and mental QoL | Sociodemographic and clinical variables |
| Morrill, E.F., 2008 [54] | Cross-sectional | United States | 161 women aged 36–87 years (mean = 59, SD = 10.9. 85% = Caucasian; 12% = African American; 3% = < secondary education; 44% = completed secondary education; 53% = > secondary education; 73% were married | 55% = Stage 1 43% = Stage 2 99% = Surgery 54% = Chemotherapy 62% = Radiation 67% = Tamoxifen | The average time since diagnosis was 4 years (SD = 1) | Post-traumatic Stress Disorder Checklist Civilian Version (PCL-C) | FACT-B | Post-traumatic stress symptoms were significantly associated with QoL and depression | Posttraumatic growth, sociodemographic and clinical variables |
| Northouse, LL (1999) [38] | Cross-sectional | United States | 98 African American women aged 29–81 years (mean = 55, SD = 18). Average education was 13 years (SD = 6). 41% were married | 70% = Mastectomy | The average time since diagnosis was 6 years (SD = 3). Time since diagnosis ranged from 1 to 15 years | Omega Screening Questionnaire (OSQ) | FACT-B | Symptom distress made a significant independent contribution to women’s QoL. The influence of current concerns on women’s QoL was mediated by appraisal of illness | Optimism, appraisal of illness, family functioning, and sociodemographic and clinical variables |
| Ashing – Giwa K.T., 2010 [33] | Cross-sectional | United States | 703 participants aged 29–91 years (mean = 55, SD = 13). European- (n = 179), African- (n = 135), | 11.1% = Stage 0 36.7% = Stage 1 38.5% = Stage 2 13.7% = Stage 3 | 1–5 years since diagnosis (mean = 3 years) | Life burden- Life Stress Scale | FACT-B- Physical and emotional well-being | Life burden was significantly related to physical and psychological QoL | Social support, Health care system-patient-doctor relationship, comfort in... |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|--------------------------|-------------|---------------------------------|---------------------------------|---------|----------------------|
| DiSipio T et al., 2009 [35] | Cross-sectional | Australia | Latina- (n = 183), and Asian- (n = 206) Americans. 14.4% = < secondary education; 10.8% = completed secondary education; 74.8% = > secondary education | PRIMARY - 58.5% = Lumpectomy/ other; 38.4% = Mastectomy; 15.6% = Mastectomy and reconstruction; 57.8% = Chemotherapy; 66.0% = Radiation | Recruitment between April 2006 March 2012 post diagnosis | Amount of stress and perceived handling of stress | FACT-B + 4 (plus arm morbidity) | Greater primary stressors (negative self-image and life stress) were associated with poorer mental health Greater secondary stress (family communication strain) had negative effects on mental health outcomes | Social support, health care service needs, overall health self-efficacy and sociodemographic and clinical variables |
| Paek M, 2016 [47] | Cross-sectional | United States | 323 women, 67% of women were aged ≥ 50 years. 202 regional based and 121 rural. 54% = < secondary education; 32% = completed secondary education; 14% = > secondary education. 77% were married | 61% = Complete local excision 39% = Mastectomy/ partial / radical Adjuvant treatment 18% = No treatment 82% = Chemotherapy / Radiotherapy | There was an average of 3.49 years since diagnosis (SD = 1.47). | Negative Self-Image (FACT-B) Urban Life Stress Scale Secondary Stressor The Family Communication Scale of the Family Adaptability and Cohesion Evaluation (FACES-IV) and the Family Avoidance of Communication about Cancer (FACC) | FACT-B: Emotional Well-Being subscale SF-36-Vitality subscale | Post-traumatic Growth Inventory | Coping |
| Morrill, E.F., 2008 [54] | Cross-sectional | United States | 161 women aged 36–87 years (mean = 59, SD = 10.9). 85% = Caucasian 12% = African American 3% = < secondary education 44% = completed secondary education 53% = > secondary education | 55% = Stage 1 43% = Stage 2 99% = Surgery 54% = Chemotherapy 62% = Radiation 67% = Tamoxifen | The average time since diagnosis was 4 years (SD = 1). | Posttraumatic Growth Inventory | FACT-B | Greater primary stressors (negative self-image and life stress) were associated with poorer mental health Greater secondary stress (family communication strain) had negative effects on mental health outcomes | Social support, health care service needs, overall health self-efficacy and sociodemographic and clinical variables |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|--------------|---------|-----------------------------|-------------------------|-------------|---------------------------------|---------------------------------|---------|---------------------|
| Bellizzi K.M. (2009) [27] | Longitudinal | United States | secondary education. 73% were married | 802 women aged on average 57.2 years (SD = 10.1). 62.3% = Caucasian; 12.2% = Hispanic; 25.5% = Black. 25.4% = < or completed secondary education; 74.6% = > secondary education 56% were married | 32.4% = Surgery only 36.8% = Surgery + Radiation 91% = Surgery + Chemotherapy 21.7% = Surgery + Radiation + Chemotherapy | Baseline questionnaire – on average 6.1 months following diagnosis, Time 2–24 months after baseline, Time 3–35 months after baseline | Posttraumatic Growth Inventory | SF-36 – physical component score (PCS) and mental component score (MCS) | Posttraumatic growth was significantly associated with a lower mental QoL No association with physical QoL | Religiosity and sociodemographic and clinical variables |
| Cheng A.S.K., 2016 [43] | Cross-sectional | China | 90 women aged between 18 and 60 years. 30 were breast cancer survivors, 30 had musculoskeletal conditions, and 30 healthy women. 86.7% = < or completed secondary education; 13.3% = > secondary education. 53.3% were married | 42.3% = Early Stage 30.8% = Mid Stage 26.9% = Late Stage 10% = Surgery 13.3% = Radiation 10% = Surgery + Radiation 66.7% = Surgery + Radiation + Chemotherapy | Time since completing treatment was 36 months (SD = 33) | Cognitive Symptom Checklist-Work | EORTC QLQ-C30 | The number of cognitive symptoms was significantly higher in breast cancer survivors, especially for the symptoms related with working memory. The cognitive limitations were significantly associated with QoL | Anxiety, depression, work limitations and sociodemographic and clinical variables |
| Cheng A.S.K., 2016 [43] | Cross-sectional | China | 90 women aged between 18 and 60 years. 30 were breast cancer survivors, 30 had musculoskeletal conditions, and 30 healthy women. 86.7% = < or completed secondary education; 13.3% = > secondary education. 53.3% were married | 42.3% = Early Stage 30.8% = Mid Stage 26.9% = Late Stage 10% = Surgery 13.3% = Radiation 10% = Surgery + Radiation 66.7% = Surgery + Radiation + Chemotherapy | Time since completing treatment was 36 months (SD = 33) | Work Limitation Questionnaire (WLQ) | EORTC QLQ-C30 | There was no significant difference in the overall WLQ productivity loss score among the three groups | Depression, anxiety, cognitive symptoms, and sociodemographic and clinical variables |
| Ashing – Giwa K.T. | Cross-sectional | United States | 703 participants aged 29–91 years (mean = 55, 11.1% = Stage 0 36.7% = Stage 1 1–5 years since diagnosis (mean = 3 years) | | Health care system-patient-doctor | FACT-B-Physical and Health Care Inventory | Only European and Latina-Americans | Social support, life burden and |
| Primary Author, Year | Study design | Country | Participant characteristics | Cancer stage & treatment | Time period | Psychosocial measure (predictor) | Quality of Life measure (outcome) | Results | Covariates (adjusted) |
|----------------------|-------------|---------|-----------------------------|--------------------------|------------|---------------------------------|---------------------------------|---------|--------------------|
| 2010 [33]            |             |         | SD = 13, European- (n = 179), African- (n = 135), Latina- (n = 183), and Asian- (n = 206) Americans. 14.4% = < secondary education; 10.8% = completed secondary education; 74.8% = > secondary education | 38.5% = Stage 2, 13.7% = Stage 3, 58.5% = Lumpectomy/other; 38.4% = Mastectomy; 15.6% = Mastectomy and reconstruction; 57.8% = Chemotherapy; 66.0% = Radiation | relationship, comfort in health care system and diagnostic care delay | emotional well-being scale SF-36 -general health perception sub-domain and pain sub-domain | showed positive relationships between patient-doctor relationship and psychological well-being. European-Americans showed the direct impact of diagnostic care delay on physical QoL | sociodemographic variables |

Functional Assessment of Cancer - Breast Cancer (FACT-B), Medical Outcomes Study Short Form (SF-36), The European Organisation of Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), The European Organisation of Research and Cancer Treatment Quality of Life Questionnaire - Breast Cancer (QLQ-BR23), Functional Assessment of Cancer Therapy - General (FACT-G), Quality of Life Index - Cancer Version (QLI-CV), Quality of Life Measurement (QoL-M), Quality of Life in Adult Cancer Survivors (QLACS), Quality of Life Cancer Survivor Version (QOL-CS), Global Life Satisfaction Scale (GLSS)
| QoL measure                                                                 | Frequency used | Primary Author, Year |
|---------------------------------------------------------------------------|----------------|----------------------|
| Functional Assessment of Cancer - Breast Cancer (FACT-B). This 44-item    | 13             | Ashing-Giwa, K. T, 2010 [33], DiSipio, T., 2009 [35], Goyal, N., 2018 [23], Janz, N., 2014 [26], Manning-Walsh, J., 2005 [48], Morrill, F., 2008 [54], Northouse, L., 1999 [38], Paek, M.S., 2016 [47], Paek, M.S., 2016 [25], Taylor, T., 2012 [30] Avis N.E. 2005 [41], DeShields T 2006 [24], Wildes, K., 2009 [49] |
| Medical Outcomes Study Short Form (SF-36). This questionnaire consists of | 8              | Lewis, J., 2001 [37], Paek, M.S., 2016 [47], Huang, C.Y., 2013 [36], Ashing-Giwa, K. T, 2010 [33], Ganz P.A., 2003 [52], Petersen, L.R., 2008 [50], Bouskill, K., 2016 [53], Bellizzi K.M., 2010 [27] |
| The European Organisation of Research and Treatment of Cancer Quality of  | 6              | Akechi, T., 2015 [45], Cheng, A.S.K., 2016 [43], Dura-Ferrandis, E., 2016 [28], Kim, S. H., 2008 [44], Edlib Z, 2016 [56], Koch, L, 2014 [29] |
| Life Questionnaire (EORTC, QLC-C30). This questionnaire consists of 30 items | 3              | Koch, L, 2014 [29], Begovic-Juhant, A., 2012 [42], Kim, S. H., 2008 [44] |
| The European Organisation of Research and Cancer Treatment Quality of Life | 3              | Farren, A., 2010 [51], Sammarco, A., 2008 [32], Pedro L.W.,2001 [39] |
| Ladder of Life provides a global single-item QOL score. Respondents are   | 2              | Begovic-Juhant, A., 2012 [42], Simone S.M.H., 2013 [31] |
| Ladder of Life - adapted from the Ladder of Life - asks individuals to    | 2              | Avis N.E. 2005 [41], Ganz P.A., 2003 [52] |
| Quality of Life in Adult Cancer Survivors (QLACS). This 47-items          | 1              | Carver, C. S., 2006 [13] |
| Quality of Life Cancer Survivor Version (QOL-CS). This 41-items           | 1              | Cheng, H., 2013 [34] |
| Global Life Satisfaction Scale (GLSS) - adapted from the Ladder of Life   | 1              | Kessler, T., 2002 [46] |
Frequency of psychosocial determinants measurement tools per individual QoL measures in breast cancer survivors

A range of different measurement tools were used per psychosocial determinant (Table 4). There were 10 different measures of social support used in 14 studies, with the Medical Outcomes Survey (MOS) Social Support Survey and the Interpersonal Support Evaluation List (ISEL) used most frequently (3 studies respectively). The majority of measurement tools were used in only 1 or 2 studies. Table 5 presents the frequency of the individual psychosocial determinant measures per individual QoL measure. The 14 studies that measured the influence of the determinant social support employed 10 different measures of social support and 7 different measures of QoL. The MOS Social Support Survey was used to measure social support in 3 different studies but only 2 of these studies used the same QoL measure [23, 33]. Similarly depression was measured by 4 different measures and its influence was assessed using 4 different QoL measures. While future appraisal and perspective was measured in 7 studies using 8 different measures and 6 different QoL measures; only 2 studies used the same measure for the determinant (uncertainty in illness) and QoL [32, 51].

Assessing the influence of the psychosocial determinants on QoL in breast cancer survivors

Among the studies that investigated social support, the general conclusion was that low perceived support was associated with a worse QoL [35, 41, 56] and higher levels of support were associated with better QoL [13, 23, 28, 32, 34, 37, 38]. Three studies found that the influence of social support on QoL varied by the type of support e.g. appraisal, belonging [36, 39]. Only 2 studies found no association between social support and QoL [26, 33].

For depression, 6 studies showed an inverse relationship with higher/lower levels of depression associated with a lower/higher QoL [23, 24, 26, 31, 42, 44] and one study found no association [43]. Out of the 7 studies that investigated future appraisal and perspectives, fear/worry about cancer recurrence was associated with a lower QoL in 4 studies [26, 29, 30, 52]. Higher uncertainty about illness was found to be associated with a lower QoL in 2 studies [32, 51] and appraisal of illness was also shown to mediate the influence of concerns and optimism on women’s QoL in one study [38].

The 5 studies that looked into coping generally found that the most relevant aspect of coping was the type of coping strategy one used, with disengagement, self-distrauction, keeping to self and wishful thinking all having a negative association with QoL [28, 41, 47]. In general higher utilisation of active coping and lower utilisation of passive coping were positively associated with QoL [23, 25, 41]. Four of the 5 studies that assessed the role of optimism on QoL found that higher levels of optimism were positively associated with QoL [13, 23, 28, 50]; the remaining study was null [38]. All 5 studies that investigated stress found that greater psychological stress, symptom distress and life burden were associated with a lower QoL [33, 35, 38, 47, 54].

The 4 studies that examined the association between faith or spirituality and QoL had mixed findings. One study found that women with greater spiritual beliefs were more likely to have a lower emotional QoL [26], and another study reported that spiritual struggles were associated with lower QoL [48]. The other 2 studies concluded that higher rates of engagement with faith and spirituality had a positive impact on QoL [23, 49].

For the 3 studies that assessed anxiety, 2 studies reported that higher anxiety was associated with a lower QoL [31, 45] while the remaining study found a null association [43]. In 3 individual studies higher confidence, self-efficacy and self-esteem were each found to be associated with higher QoL [13, 35, 39]. Higher frequency of intrusive thoughts in 2 studies [23, 37] and a perceived negative impact of cancer in 1 study were associated with a lower QoL [53].

Two studies found that higher scores for posttraumatic growth were associated with a higher QoL [27, 54]. While higher scores on negative affect and cognitive limitations were found to be associated with a lower QoL [43, 46]. Work limitations were reported to have no significant impact on QoL [43]. The one study on health care system determinants found that a positive patient-doctor relationship was associated with better psychological well-being, while diagnostic care delay was associated with lower physical well-being in some ethnic groups [33].

Discussion

This review confirms that there are numerous psychosocial determinants that are associated with QoL in breast cancer survivors. The psychosocial determinants investigated most frequently were social support, depression and future appraisal and perspective. There was less research undertaken on societal determinants, such as healthcare system factors, work limitations etc. In
| Psychosocial measure                                                                 | Frequency used | Primary Author, Year                                                                 |
|-------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------|
| **Social Support**                                                                   |                |                                                                                      |
| Medical Outcomes Study (MOS) Social Support Survey-(19 items)- measures perceived    | 3              | Ashing – Giwa K.T., 2010 [33], Dura-Ferrandis E, 2016 [28], Goyal N. G, 2018 [23]   |
| availability of support: emotional/informational support, tangible support,          |                |                                                                                      |
| affective support, and positive social interaction [62]                               |                |                                                                                      |
| Interpersonal Support Evaluation List (ISEL)- 40 items- evaluates the perceived     | 3              | Carver C.S. 2006 [13], Huang C.Y. 2013 [36] Lewis, J., 2001 [37]                     |
| availability of four dimensions of social support consisting of belonging, appraisal,|                |                                                                                      |
| tangible and self-esteem support. Belonging support is the availability of people    |                |                                                                                      |
| with whom one can do things. Appraisal support is the availability to talk to or     |                |                                                                                      |
| behaviours of a supporting person, including empathy, caring, love and trust. Tangible|                |                                                                                      |
| support is instrumental aid and comprises providing support in a physical way that    |                |                                                                                      |
| assists an individual in meeting their role responsibilities. Self-esteem support is  |                |                                                                                      |
| the availability of a positive comparison when comparing oneself with others [63]     |                |                                                                                      |
| Social Support Questionnaire (SSQ-6) - 6 questions asking about the affective aspects | 1              | Cheng H, 2013 [34]                                                                   |
| of social support. Each question has two parts, which are the number of support      |                |                                                                                      |
| persons (SSQ6-N) and the satisfaction with social support (SSQ6-S) [64].             |                |                                                                                      |
| Social Networks Index - assesses participation in 12 types of social                  | 1              | DiSipio T, 2009 [35]                                                                |
| relationships. These include relationships with a spouse, parents, parents-in-law,   |                |                                                                                      |
| children, other close family members, close neighbours, friends, workmates, school- |                |                                                                                      |
| mates, fellow volunteers, members of groups without religious affiliation, and       |                |                                                                                      |
| religious groups. One point is assigned for each type of relationship (possible score |                |                                                                                      |
| of 12) for which respondents indicate that they speak (in person or on the phone) to |                |                                                                                      |
| persons in that relationship at least once every 2 weeks [65].                       |                |                                                                                      |
| Emotional support from health care providers, family members and friends/co-workers | 1              | Janz N.K., 2014 [26]                                                                |
| (rated low vs. high). Satisfaction with partner scale was combined with marital      |                |                                                                                      |
| status as follows: (1) respondent did not report a partner; (2) respondent is          |                |                                                                                      |
| slightly satisfied or very satisfied with partner relationship, or (3) respondent is  |                |                                                                                      |
| neutral, slightly, or very unsatisfied with their partner.                           |                |                                                                                      |
| Social Support Questionnaire (SSQ-8) is a self-administered measure of social         | 1              | Sammarco, A., 2008 [32]                                                             |
| support from five sources: spouse, family member, friend, nurse, and physician (40  |                |                                                                                      |
| items in all) [66].                                                                 |                |                                                                                      |
| Family APGAR- family functioning- a 5-item scale assesses participants’ satisfaction | 1              | Northouse, LL (1999) [38]                                                           |
| with their family’s ability to communicate, assist one another, and respond to       |                |                                                                                      |
| change. Each item (e.g., “I am satisfied when I can turn to my family for help      |                |                                                                                      |
| when something is troubling me”) is rated on a scale from 1 (never) to 5 (always)    |                |                                                                                      |
| Norbeck Social Support Questionnaire (NSSQ) is a self-administered 9-item instrument  | 1              | Pedro L.W. (2001) [39]                                                              |
| that measures the multiple dimensions of social support including functional         |                |                                                                                      |
| components of affirmation, aid, and affection; social network properties of          |                |                                                                                      |
| frequency of contact, number in network, and duration of relationships; and recent   |                |                                                                                      |
| losses of supportive relationships [68].                                             |                |                                                                                      |
| Supportive Care Needs Survey- Short Form- is a standardised instrument for measuring  | 2              | Edib Z (2016) [40]                                                                  |
| cancer patients’ perceived needs across a range of domains. A total number of 34-     |                | DiSipio T., 2009 [35]                                                               |
| items are divided into five domains: physical/daily living (5 items),                |                |                                                                                      |
| psychological (10 items), sexuality (3 items), patient care and support (5 items)    |                |                                                                                      |
| and health system and information needs (10 items) [69].                             |                |                                                                                      |
| Supportive Care Needs Survey – Health system and information needs domain only       |                |                                                                                      |
| only [69].                                                                           |                |                                                                                      |
| Cancer Rehabilitation Evaluation System (CARES)- a multidimensional self-administered | 1              | Avis N.E. (2005) [41]                                                              |
| instrument containing multiple problem areas. Administered the marital and sexual     |                |                                                                                      |
| scales and the body image subscale. The marital scale includes five subscales        |                |                                                                                      |
| (communication with partner, affection with partner, interaction with partner,       |                |                                                                                      |
| neglect by partner, and overprotection). The sexual scale included two subscales:    |                |                                                                                      |
| sexual interest and sexual dysfunction [70].                                         |                |                                                                                      |
| **Depression**                                                                       |                |                                                                                      |
| Centre for Epidemiological Studies-Depression (CES-D) is a screening tool for        | 2              | Begovic-Juhant, A., 2012 [42], DeShields, T., 2006 [24]                             |
| depressive symptoms and includes 20-item to investigate perceived mood and level of  |                |                                                                                      |
| functioning within the past 7 days. Scores of 16 or higher are considered indicative  |                |                                                                                      |
| of depression [71].                                                                 |                |                                                                                      |
| Psychosocial measure                                                                 | Frequency used | Primary Author, Year                                      |
|--------------------------------------------------------------------------------------|----------------|----------------------------------------------------------|
| Hospital Anxiety and Depression Scale (HADS) is a validated screening instrument for| 2              | Cheng A.S.K., 2016 [43], Simone, S.M. H, 2013 [73]       |
| anxiety and depression in somatically ill patients. A score of 0 to 7 is classified  |                |                                                          |
| as normal, a score of 8 to 10 is considered to indicate a possible anxiety or depressive |                |                                                          |
| disorder, and a score of 11 or above is considered to indicate a probable anxiety or depressive disorder [72]. |                |                                                          |
| Becks Depression Inventory- a 21-item, self-report rating inventory that measures char-| 2              | Goyal N. G, 2018 [23], Kim, S.H., 2008 [44]               |
| acteristic attitudes and symptoms of depression [74].                                  |                |                                                          |
| Depression history - no history, history of depression without current symptoms, his- | 1              | Janz N.K., 2014 [26]                                     |
| tory of depression with current symptoms                                              |                |                                                          |
| Anxiety                                                                              |                |                                                          |
| Hospital Anxiety and Depression Scale (HADS) is a validated screening instrument for| 3              | Akechi, T., 2015 [45], Cheng A.S.K., 2016 [43], Simone,  |
| anxiety and depression in somatically ill patients. A score of 0 to 7 is classified  |                | S.M. H, 2013 [73]                                       |
| as normal, a score of 8 to 10 is considered to indicate a possible anxiety or depressive |                |                                                          |
| disorder, and a score of 11 or above is considered to indicate a probable anxiety or depressive disorder [72]. |                |                                                          |
| Positive and negative affect                                                         |                |                                                          |
| Positive and Negative Affect Scale (PANAS) is a 20-item tool that contains two 10-item scales, one measuring positive affect and the other negative affect. Positive affect items reflect the extent to which an individual feels enthusiastic, active, and alert. Negative affect items reflect subjective feelings of distress, including anger, contempt, guilt, fear, and nervousness [75]. | 1              | Kessler, T. A. 2002 [46]                                 |
| Coping                                                                               |                |                                                          |
| Brief COPE- 9 of the original 14 subscales were grouped. Active coping, instrumental support, emotional support, acceptance, and positive reframing were combined to assess Engagement Coping. The behavioral disengagement and denial subscales were combined as Disengagement Coping. Venting and self-distraction were considered as separate subscales [76]. | 1              | Dura-Ferrandis E, 2016 [28]                             |
| Brief COPE- The 28-item scale was used to measure 14 types of coping strategies. Two domains were formed from seven strategies: active coping (active coping, use of emotional support, use of instrumental support, and positive reframing) and passive coping (self-blame, denial, and behavioral disengagement) [76]. | 2              | Goyal N. G, 2018 [23], Paek, M., 2016 [25]               |
| Family Crisis Oriented Personal Evaluation Scale (F-COPES)- assesses a family’s problem-solving strategies in response to family problems/difficulties and includes 3 external (use of outside resources) and 2 internal family coping strategies (utilize the family’s internal strengths/resources). This study focused on the following coping: external (6-item acquiring social support from friends/relatives, 3-item acquiring social support from neighbors, and 4-item seeking spiritual support) and internal (8-item reframing) family coping strategies [77]. | 1              | Paek M, 2016 [47]                                       |
| Ways of Coping-Cancer Version - participants were asked to indicate how often they had used each of the following strategies in the last 6 months in attempting to cope with the most stressful part of their breast cancer; seeking and using social support, keeping feelings to self, using positive cognitive restructuring, using wishful thinking, making changes, spirituality and detachment. Three items assessed feelings of preparedness for coping with breast cancer, how well prepared patients were for the impact of cancer on their relationships, how they might feel about their appearance after surgery, and availability of counseling or support groups [78]. | 1              | Avis N.E. (2005) [41]                                  |
| Confidence and self-efficacy                                                         |                |                                                          |
| Question- confidence about remaining cancer free- ‘To what extent do you believe that you will remain free of cancer in the future?’ answered on a nine-point scale, with 9 = absolutely sure I won’t get cancer again, 5 = I don’t know and 1 = not at all confident, I expect to get cancer again. | 1              | Carver C.S. et al. 2006 [13]                            |
| The Self Rated Abilities for Health Practices Scale (SRAHP) is a 28-item, 5-point scale to measure self-perceived ability to implement health-promoting behaviors. SRAHP contains four subscales: Exercise, Nutrition, Responsible | 1              | DiSipio T et al., 2009 [35]                             |
Table 4 Description and frequency of psychosocial measures (Continued)

| Psychosocial measure                                                                 | Frequency used | Primary Author, Year |
|-------------------------------------------------------------------------------------|----------------|----------------------|
| Health Practice, and Psychological Well Being. Each subscale has seven items.      |                | Goyal N. G, 2018 [23] |
| Respondents are asked to rate the extent to which they are able to perform health  |                | Janz N.K., 2014 [26] |
| practices related to these four domains [79],                                      |                | Northouse, LL (1999) [38] |
| Rosenberg Self-Esteem Scale- a self-administered, 10-item scale that measures      | 1              | Pedro L.W. (2001) [39] |
| the self-acceptance aspect of self-esteem or the overall sense of being             |                | Manning-Walsh, J, 2005 [48] |
| capable, worthwhile, and competent [80].                                            |                |                      |
| Rosenbaum Self-Control Schedule- used as a measure of learned resourcefulness       | 1              | Pedro L.W. (2001) [39] |
| (36 items). For each of the 36 items participants indicate the degree to             |                |                      |
| which it describes their behavior on a 6-point scale ranging from extremely          |                |                      |
| descriptive (+ 3) to extremely non-descriptive (− 3) [81].                         |                |                      |
| Spirituality                                                                        |                |                      |
| Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being (FACIT     | 1              |                      |
| T-SP-12). This 12-item questionnaire consists of two subscales, one measuring       |                |                      |
| a sense of meaning and peace and the other assessing the role of faith in illness   |                |                      |
| [82].                                                                              |                |                      |
| Religious Coping (RCOPE) - spiritual struggle was measured using the 7-item        | 1              |                      |
| Negative Coping subscale of RCOPE. Examples of items on the Negative               |                |                      |
| Coping subscale include “I wondered what I did for God to punish me” and           |                |                      |
| “I wondered whether God had abandoned me”. Measured on a 4-point                    |                |                      |
| Likert-type scale ranging from 0 (not at all) to 3 (a great deal), the              |                |                      |
| participants were asked to indicate the degree to which they used each strategy    |                |                      |
| [83].                                                                              |                |                      |
| System of Beliefs Inventory– (SBI-15R) - which measures both religious and          | 2              |                      |
| spiritual aspects of belief systems in coping with a life-threatening illness.       |                |                      |
| The SBI-15R encompasses both constructs by assessing beliefs and practices of      |                |                      |
| faith systems (10 items, Subscale I) and social support from the religious and/or   |                |                      |
| spiritual community (5 items, Subscale II), and applies equally to atheists,       |                |                      |
| agnostics, those with no religious affiliation, and those with a moderate or        |                |                      |
| strong religious or spiritual orientation [84].                                     |                |                      |
| The SBI-15R was modified to include 4 items from the Beliefs and Practices         |                |                      |
| subscale (e.g. “Religion is important in my day-to-day life”, “Prayer has helped   |                |                      |
| me cope during times of serious illness”) and four items from the Social Support   |                |                      |
| subscale (e.g., “I enjoy attending religious functions held by my religious or      |                |                      |
| spiritual group”, “I know someone in my religious or spiritual community that I     |                |                      |
| can turn to”). Items from each subscale were averaged for all participants, with    |                |                      |
| a range of values from 1 (strongly disagree) to 5 (strongly agree) [84].            |                |                      |
| Optimism                                                                            |                |                      |
| Life Orientation Test- comprised of 8 items, plus 4 filler items that are not       | 4              | Carver C.S. et al. 2006 [13], Dura-Ferrandis E, 2016 [28], |
| calculated in the total score. Each item (e.g., “I always look on the bright side  |                | Goyal N. G, 2018 [23], Northouse, LL (1999) [38] |
| of things”), is rated on scale from 0 (strongly disagree) to 4 (strongly agree).    |                |                      |
| Individual items are summed (excluding the filler items) with higher scores        |                |                      |
| indicating more dispositional optimism [85].                                       |                |                      |
| The Minnesota Multiphasic Personality Inventory (MMPI) – The original MMPI is a   | 1              | Petersen L.R. (2008) [50] |
| 566-item self-report inventory that utilizes a true/false response format. The     |                |                      |
| MMPI yields information about personality factors related to psychiatric           |                |                      |
| syndromes. The optimism-pessimism (PSM) scale was developed using 298 MMPI items  |                |                      |
| [86].                                                                              |                |                      |
| Future perspectives and appraisal                                                  |                |                      |
| Mishel Uncertainty in Illness Scale – Community Form (MUISC) is a 23-item,        | 2              | Sammarco, A., 2008 [32], Farren, A. T, 2010 [51] |
| 5-point (strongly disagree to strongly agree), Likert-type scale, self-             |                |                      |
| administered measure of the uncertainty perceived in illness [87].                 |                |                      |
| Appraisal of illness scale- consists of 27 scored items (e.g., “this situation     | 1              | Northhouse, LL (1999) [38] |
| threatens to overwhelm me”) and 5 unscored filler items, with a 5-point             |                |                      |
| Likert-type response format with choices ranging from 1 (very false) to 5          |                |                      |
| (very true) [88].                                                                |                |                      |
| Power as Knowing Participation in Change Tool (PKPCT) is a 52 item                 | 1              | Farren, A. T, 2010 [51] |
| semantic differential scale designed to measure an individual’s capacity to         |                |                      |
| participate knowingly in change on four subscales (awareness, choices, freedom to  |                |                      |
| act intentionally, and involvement in creating change) [89].                       |                |                      |
Table 4 Description and frequency of psychosocial measures (Continued)

| Psychosocial measure | Frequency used | Primary Author, Year |
|----------------------|----------------|----------------------|
| Self-Transcendence Scale (STS) measures the capacity for self-transcendence. It is a unidimensional, 15-item, 4-point Likert scale. The scale ranges from not at all to very much [90]. | 1 | Farren, A.T., 2010 [51] |
| Received enough information from their doctors or the staff about risk of breast cancer recurrence (yes/no). (Time 1) Perceived likelihood of breast cancer recurrence ("not at all likely" to "very likely to recur"). (Time 2) Worry about recurrence—concern the cancer would recur in the same breast, the other breast, or to another part of the body. (Change from Time 1 to Time 2 scores Decision regret—categorized as a lot of decision regret versus none or some decision regret [91]. | 1 | Janz N.K., 2014 [26] |
| Fear of Progression Questionnaire—Short Form (FoP-Q-SF) consists of 12 items pertaining to four scales (affective reactions, partnership/family, occupation, and loss of autonomy), answered on a Likert scale (frequency of experience of fear/worry: 1 = never to 5 = very often) [92]. | 1 | Koch, L 2014 [29] |
| Concerns of Recurrence Scale (CARS) assesses the extent and the nature of women’s concerns about breast cancer recurrence. Two components; Overall fear index includes 4 questions on frequency, potential for upset, consistency, and intensity of fears. Scores are given on a six-point Likert scale that ranges from 1 (not at all) to 6 (continuously). The nature of women’s fears about recurrence includes 26 items subdivided into four domains: health worries, womanhood worries, role worries, and death worries. Health worries (11 items) measures concern about future treatment (e.g., chemotherapy, radiation, and surgery), emotional upset, physical health, carrying out planned activities, and loss of breast(s). Womanhood worries (7 items) measure femininity, sexuality, womanhood, body image, romantic relationships, identity, and spirituality or faith. Role worries (6 items) measure roles and responsibilities at work and at home, relationships with friends and family, physical ability to complete daily activities, financial problems, and self-confidence. Death worries (2 items) measure the possibility that a recurrence of breast cancer could lead to death. Scores range from 0 (not at all), 1 (a little), 2 (moderately), 3 (a lot), to 4 (extremely), to indicate the extent to which they worry about each item [93]. | 1 | Taylor, T.R., 2012 [30] |
| Perceptions of life- a 12-item scale to measure perceptions of life after cancer (developed by the authors). Example items include "Surviving breast cancer has changed my outlook on life,", "I get less worried about trivial things," and "I feel more vulnerable now, as if the world is a more dangerous place." Respondents indicate the extent to which they believe their outlook has changed on a 5-point scale, ranging from 0 (not at all) to 4 (very much). The first factor includes six items assessing changes in perspectives and priorities as a measure of positive meaning. The second factor includes five items assessing fears about recurrence and about one’s body, and measures vulnerability [94]. | 1 | Ganz P.A. (2003) [52] |
| Impact of Events Survey (IES)- The IES is a 15 item self-report measure of intrusive thoughts and avoidance associated with a stressor (breast cancer). In this study the Intrusion subscale of the IES is considered a measure of processing. Participants rated how true each statement has been for them in the past 3 weeks, using the following scale: 0 = Not at all, 1 = Rarely, 3 = Sometimes, and 5 = Often. All statements were anchored to the participant’s cancer and its treatment, such as “Thought about it when I didn’t mean to” and “I had dreams about it.” [95] | 1 | Lewis J., 2001 [37] |
| Illness Intrusiveness Rating Scale- measures the impact of cancer on multiple life areas (13-items). Using a Likert scale ranging from one (not very much) to seven (very much), participants rate the degree of interference caused by their illness or its treatment with 13 aspects of their lives. These domains are: health, diet, work, active and passive recreation, financial situation, relationship with spouse, sex life, family and other social relations, self-expression/self-improvement, religious expression and community/civic involvement [96]. | 1 | Goyal N. G, 2018 [23] |
| Impact of Cancer scale—is a self-report instrument that is designed to capture how long-term survivors interpret the overall positive and negative impacts of cancer [97]. | 1 | Bouskill K. (2016) [53] |
Table 4 Description and frequency of psychosocial measures (Continued)

| Psychosocial measure                                                                 | Frequency | Primary Author, Year |
|-------------------------------------------------------------------------------------|-----------|----------------------|
| of having cancer in their lives. Item responses are in a five-point Likert scale    |           |                      |
| format where respondents are asked to give their overall agreement from 1 (strongly |           |                      |
| disagree) to 5 (strongly agree). Mean scores are compiled for each domain and then   |           |                      |
| aggregated into the two meta-domains: the positive impact of cancer (PIC) and the    |           |                      |
| negative impact of cancer (NIC) [97].                                               |           |                      |
| Stress                                                                              |           |                      |
| Post-traumatic Stress Disorder Checklist Civilian Version (PCL-C) - assesses        | 1         | Morrill, E.F., 2008  |
| post-traumatic stress symptoms. The PCL-C is a 17-item self-report checklist         |           | [54]                 |
| of PTSD symptoms based closely on the DSM-IV criteria. Respondents rate each item   |           |                      |
| from 1 (“not at all”) to 5 (“extremely”) to indicate the degree to which they       |           |                      |
| have been bothered by that particular symptom over the past month [98].             |           |                      |
| Omega Screening Questionnaire (OSQ) - is comprised of four parts: (a)                | 1         | Northouse, LL (1999) |
| demographic and background information, (b) health history, (c) inventory           |           | [38]                 |
| of current concerns, and (d) symptoms scale. The demographic section of the OSQ     |           |                      |
| includes a number of questions about the respondent’s age, education, income, and    |           |                      |
| so forth. The Inventory of Current Concerns is a 40-item scale that asks           |           |                      |
| participants to rate the extent to which they have experienced a list of concerns   |           |                      |
| about issues such as finances, children and work in the past                         |           |                      |
| month. Participants rate each item according to whether the statement is not true   |           |                      |
| (0), somewhat true (1), or true (2) for them. The Symptoms Scale asks participants  |           |                      |
| to rate the extent to which they have experienced 13 symptoms (e.g., fatigue,       |           |                      |
| breathing problems, pain). Response options are 0 (no trouble), 1 (some), and 2     |           |                      |
| (a lot) [99].                                                                        |           |                      |
| Life Stress Scale – Life burden- which assesses the level of stress associated      | 1         | Ashing –Giwa K.T.,   |
| with various aspects of daily living. Scale consists of family (6-items),           |           | 2010 [33]            |
| functional (4-items), and neighborhood stresses (6-items). Items are rated from     |           |                      |
| 1 to 5, with a higher score indicating less life burdens/ stress, and             |           |                      |
| calculated into a mean score [100].                                                |           |                      |
| Amount of stress (very little, some, a moderate amount, a lot) Perceived            | 1         | Disipio T et al.,    |
| handling of stress (not well at all, not well, fairly well, very well)             |           | 2009 [35]            |
| FACT-B Additional Concerns subscale.                                              | 1         | Paek M, 2016         |
| Negative self-image was measured using two items (e.g. “I feel sexually           |           | [47]                 |
| attractive” and “I am able to feel like a woman”) [21]                             |           |                      |
| Urban Life Stress Scale assesses the level of life-related stress for the past      | 1         | Paek M, 2016         |
| 3-month [101]. In this study, a three-factor structure was selected and named      |           | [47]                 |
| as “functional stress” (e.g., finances, job situation; 3-item), “stressful life-     |           |                      |
| events” (e.g., illness of someone close; 2-item), and “role stress” (e.g.,         |           |                      |
| parenting; 3-item).                                                               |           |                      |
| The Family Communication Scale of the Family Adaptability and Cohesion              | 1         | Paek M, 2016         |
| Evaluation (FACES-IV) [102] and the Family Avoidance of Communication about       |           | [47]                 |
| Cancer (FACC) Scales [103] were used to assess both general and cancer-specific     |           |                      |
| family communication problems. A composite score was created by averaging the z    |           |                      |
| scores of both measures, with greater scores representing higher communication     |           |                      |
| strain.                                                                             |           |                      |
| Posttraumatic Growth                                                               | 2         | Morrill, E.F., 2008  |
| Posttraumatic Growth Inventory-an instrument for assessing positive outcomes       |           | [54], Bellizzi K.M.  |
| reported by persons who have experienced traumatic events. This 21-item scale       |           | (2009) [27]          |
| includes factors of New Possibilities, Relating to Others, Personal Strength,      |           |                      |
| Spiritual Change, and Appreciation of Life [104].                                  |           |                      |
| Cognitive Symptoms                                                                 | 1         | Cheng A.S.K., 2016   |
| Cognitive Symptoms Checklist-Work-21 items are used to assess work-related         |           | [43]                 |
| cognitive problems. The original English version consists of three subscales,       |           |                      |
| including working memory, executive functioning, and attention. The Chinese        |           |                      |
| version used by this current study applied a two-factor instead of three-factor     |           |                      |
| structure that combined items measuring task completion and executive function     |           |                      |
| [105].                                                                             |           |                      |
| Work Limitations                                                                   | 1         | Cheng A.S.K., 2016   |
| Work Limitation Questionnaire (WLQ); measures the degree of work                   |           | [43]                 |
general, across all the 33 articles included in this review, a higher level of a positive influence and a lower level of a negative influence of a psychosocial determinant was associated with a better QoL e.g. higher social support and lower levels of depression were found to be associated with a higher/better QoL. There were some determinants such as spirituality and coping were the influence on QoL was mixed or it varied, depending on which aspect of the determinant was measured e.g. type of coping strategy; but these determinants were also less commonly investigated.

This review also identified a range of gaps and limitations in the current literature and areas for further research. The majority of studies were cross-sectional and assessed the influence of psychosocial determinants on QoL at a single point in time. It is possible that the influence of psychosocial determinants on QoL may vary over time. A US study of breast cancer survivors found that when worry about recurrence increased over time (4 years after diagnosis), women were more likely to report a decline in emotional well-being. On average, there was a gradual lessening of worry as the years of survivorship increased, but some women reported greater worry at 4 years than they did shortly after primary treatment was completed [26]. The majority of the studies were undertaken in North America and the findings may not be transferable to other countries, with differing health care systems and cultures.

There is also considerable variation in the type of measures being used to assess both QoL and the individual psychosocial determinants across studies. There were 12 different QoL measures utilised across the 33 studies. Some of the QoL measures were breast cancer specific (FACT-B), some were cancer focussed (though not specific to a particular cancer; EORTC QLQ-C30) and some were generic (SF36) and hence may not have focussed on the same aspects of QoL aspects. Thus findings may not be comparable. A systematic review of QoL instruments in long-term breast cancer survivors identified only three instruments (QLACS, QLI-CV, QOL-CS) that evaluated all four domains of QoL (physical, psychological, social and spiritual) [107]. These instruments were only used in 5 studies in the current review (Table 3). Similarly, this review identified that on average 6 different measures were used per psychosocial determinant, making comparability of findings difficult.

While the findings provide evidence of a relationship between individual psychosocial determinants and QoL, they are not conclusive. Across the 34 studies there was only ever a maximum of 2 studies where results could be directly compared and this was only feasible for 6 determinants; social support, anxiety, coping, spirituality, optimism and future perspectives and appraisal. (Table 5) The clinical relevance of the possible effects of the determinants on QoL is also difficult to interpret. Differences in QoL should be compared to the minimal important difference for the various QoL measures, if known e.g. estimated to be in the range of 3–8 points for the FACT-B [108, 109]. It is also possible given the breadth in definition of a “psychosocial determinant”, that there are a range of other determinants whose influence on QoL has yet to be measured in studies e.g. motivation, goals. A recent systematic review identified that cancer may impact patients’ life goals and life goal disturbance may be related to poorer psychological outcomes but further studies are required [110].

This is the first scoping review of the psychosocial determinants of QoL in breast cancer survivors.
Table 5 Frequency of psychosocial determinant measures per individual QoL measure

|                              | FACT-B | SF-36 | EORTC QLQ-C30 | EORTC QLQ-BR23 | FACT-G | QLI-CV | Ladder of Life | QOLM | QLAC | QOL-CS |
|------------------------------|--------|-------|---------------|----------------|--------|--------|----------------|------|------|--------|
| **Social Support**           |        |       |               |                |        |        |                |      |      |        |
| Medical Outcomes Study (MOS) Social Support Survey- 3 items | 2 [23, 33] | 1 [33] | 1 [28]        |                |        |        |                |      |      |        |
| Interpersonal Support Evaluation List (ISEL)                    | 2 [36, 37] |        | 1 [13]        |                |        |        |                |      |      |        |
| Social Support Questionnaire (SSQ)- 6 items                     |        |        |                | 1 [34]        |        |        |                |      |      |        |
| Social Support Questionnaire (SSQ)- 8 items                     |        |        |                |                | 1 [32] |        |                |      |      |        |
| Norbeck Social Support Questionnaire- 9 items                   |        |        |                |                | 1 [39] |        |                |      |      |        |
| Social Networks Index                                            | 1 [35] |        |                |                |        |        |                |      |      |        |
| Supportive Care Needs Survey                                    | 1 [35] |        |                | 1 [56]        |        |        |                |      |      |        |
| Cancer Rehabilitation Evaluation System (CARES)                  | 1 [41] |        |                |                |        |        |                | 1 [41]|      |        |
| Emotional support from others and satisfaction with partner scale| 1 [26] |        |                |                |        |        |                |      |      |        |
| Family APGAR-family functioning                                  | 1 [38] |        |                |                |        |        |                |      |      |        |
| **Depression**                                                    |        |       |               |                |        |        |                |      |      |        |
| Center of Epidemiologic Studies Depression Scale (CES-D)        | 1 [24] |        |                | 1 [42]        | 1 [42] |        |                |      |      |        |
| Hospital Anxiety and Depression Scale (HADS)                    |        |        |                | 1 [43]        | 1 [73] |        |                |      |      |        |
| Becks Depression Inventory                                       | 1 [23] |        |                | 1 [44]        | 1 [44] |        |                |      |      |        |
| Depression history                                               | 1 [26] |        |                |                |        |        |                |      |      |        |
| **Anxiety**                                                      |        |       |               |                |        |        |                |      |      |        |
| Hospital Anxiety and Depression Scale (HADS)                    |        |        |                | 2 [43, 45]    | 1 [73] |        |                |      |      |        |
| **Positive and negative affect**                                 |        |       |               |                |        |        |                |      |      |        |
| Positive and Negative Affect Scale (PANAS)                       |        |        |                |                |        |        |                | 1 [46]|      |        |
| **Coping**                                                       |        |       |               |                |        |        |                |      |      |        |
| Brief COPE- Engagement Coping, Disengagement Coping, Venting and Self-Distraction | 1 [28] |        |                |                |        |        |                |      |      |        |
| Brief COPE- active/positive coping and passive/negative coping   | 2 [23, 25] |        |                |                |        |        |                |      |      |        |
| Family Crisis Oriented Personal Evaluation Scale (F-COPES)       | 1 [47] |        |                | 1 [47]        |        |        |                |      |      |        |
| Ways of Coping-Preparedness                                     | 1 [41] |        |                |                |        |        |                |      |      |        |
| **Confidence and self-efficacy**                                 |        |       |               |                |        |        |                |      |      |        |
| Question- confidence about remaining cancer free                 |        |        |                |                |        |        |                | 1 [13]|      |        |
| Health efficacy                                                 | 1 [35] |        |                |                |        |        |                |      |      |        |
| Rosenberg Self-Esteem Scale                                     |        |        |                |                | 1 [39] |        |                |      |      |        |
| Rosenberg Self-Control Schedule                                  |        |        |                |                | 1 [39] |        |                |      |      |        |
| **Spirituality**                                                 |        |       |               |                |        |        |                |      |      |        |
| Functional Assessment of Chronic Illness Therapy- Spiritual Well-being Scale | 1 [23] |        |                |                |        |        |                |      |      |        |
| Religious Coping- negative coping subscale                       | 1 [48] |        |                |                |        |        |                |      |      |        |
| Systems of Belief Inventory                                     | 2 [26, 49] |        |                |                |        |        |                |      |      |        |
| **Optimism**                                                     |        |       |               |                |        |        |                |      |      |        |
| Life Orientation Test                                            | 2 [23, 38] | 1 [28] |                | 1 [13]        |        |        |                |      |      |        |
| The Minnesota Multiphasic Personality Inventory                 |        |        |                |                | 1 [50] |        |                |      |      |        |
However there were some limitations to this review process. It is feasible that despite an extensive search of multiple databases, some relevant papers may have been missed. Not all abstracts were screened by two independent reviewers; 75% were screened. However the adaption of the inclusion/exclusion criteria by the two independent reviewers as part of the scoping review iterative process allowed for a more focused review by alleviating any potential ambiguity, given the broad research question [20]. There was also no quality appraisal or meta-analysis of the included studies undertaken, but again is not
deemed to be part of the scoping review process [19].

Recently there has been an emphasis on developing more patient-centered care in breast cancer survivors and using an individual’s psychological needs as a guide for psychosocial treatment selection rather than their diagnostic or medical treatment [111]. Understanding the influence of psychosocial determinants on QoL in breast cancer survivors potentially helps to enable the development of more personalised and tailored intervention strategies and support services to reduce long term physical and psychological morbidity. The identified psychosocial determinants can be mapped to evidence based psychosocial treatments such as Cognitive and Behavioral Cancer Stress Management to provide patients with skills to live well with breast cancer and/or improve QoL [112].

Conclusion
This review has identified several psychosocial determinants of QoL in breast cancer survivors. The overall consistency of the associations found between the various psychosocial variables and QoL, regardless of the measures used, provides a reasonably clear picture of the influence of individual psychosocial determinants on QoL in breast cancer survivors. The fact that these associations do not depend on the specific measures used adds validity to the findings. However this review has also highlighted a clear need to standardise measures of both QoL and individual psychosocial determinants, potentially through expert consensus groups, in order to be able to evaluate the impact of psychosocial determinants on QoL systematically and to compare results across studies. Further research also needs to be undertaken in health care settings, outside of the USA; given that psychosocial determinants and QoL itself may in fact be influenced by the organisation and availability of follow-up clinical and supportive care. Future studies should also use a prospective or longitudinal design to monitor change and understand the complexity and variety of influences on QoL long-term. By improving the quality of evidence on this topic there is the potential to also improve the quality of follow-up care in breast cancer survivors.

Abbreviations
QoL: Quality-of-life; FACT-B: Functional Assessment of Cancer - Breast Cancer; FACT-G: Functional Assessment of Cancer Therapy – General; SF-36: Medical Outcomes Study Short Form; EORTC QLQ-C30: The European Organisation of Research and Treatment of Cancer Quality of Life Questionnaire; QLQ-BR23: The European Organisation of Research and Cancer Treatment Quality

Appendix

Table 6 Database search criteria

| PubMed | EMBASE | PsycINFO | CINAHL |
|--------|--------|----------|--------|
| Survivors(MeSH Terms) OR survivor*(Title/Abstract) breast neoplasms (MeSH Terms) OR Breast cancer(Title/Abstract) QOL (MeSH Terms) OR HRQOL OR physical OR emotional OR functional OR social women OR female | ‘survivors’/exp. OR survivor*:to,ab ‘breast cancer’/exp. OR ((breast NEXT/1 cancer):ti,ab) OR ((breast NEXT/1 neoplasm*:ti,ab) QOL OR HRQOL OR physical OR emotional OR functional OR social women OR female | DE “Survivors+” OR survivor* (DE "Breast Neoplasms+") QOL OR HRQOL OR Physical OR Emotional OR Functional OR Social women OR female | MH “Survivors+” OR survivor* (MH "Breast Neoplasms") QOL OR HRQOL OR Physical OR Emotional OR Functional OR Social women OR female |
of Life Questionnaire - Breast Cancer; QLI-CV: Quality of Life Index - Cancer Version; QoL-M: Quality of Life Measurement; QLACS: Quality of Life in Adult Cancer Survivors; QOL-CS: Quality of Life Cancer Survivor Version; GLSS: Global Life Satisfaction Scale

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Authors’ contributions
MC and CC were involved in the concept and design of the study. MC was the primary reviewer. MC, KB, CMK, LS and CC were involved in interpretation of the findings. MC wrote the first draft of the manuscript and KB, CMK, LS and CC contributed to subsequent drafts. All authors have read and approved the manuscript.

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