Psychoeducation for breast cancer: A systematic review and meta-analysis

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ABSTRACT

Background: Psychoeducation has emerged as an intervention for women with breast cancer (BC). This meta-analysis evaluated the effectiveness of psychoeducation on adherence to diagnostic procedures and medical treatment, anxiety, depression, quality of life (QoL), and BC knowledge among patients with BC symptoms or diagnosis and BC survivors.

Methods: A systematic literature search (in PubMed, Embase, PsycINFO and Cochrane) for randomised controlled trials (RCTs) comparing the effects of psychoeducation to control among patients with BC symptoms or diagnosis and BC survivors. Effects were expressed as relative risks (RRs) and standardized mean differences (SMDs) with their 95% confidence intervals.

Results: Twenty-seven RCTs (7742 participants; 3880 psychoeducation and 3862 controls) were included. Compared with controls, psychoeducation had no significant effect on adherence to diagnostic procedures and medical treatment (RR 1.553; 95% CI 0.733 to 3.290, p = .16), but it significantly decreased anxiety (SMD -0.710, 95% CI -1.395 to -0.027, p = .04) and improved QoL with (SMD 0.509; 95% CI 0.096 to 0.923, p < .01). No effects were found for psychoeducation on depression (SMD -0.243, 95% CI -0.580 to 0.091, p = .14), or BC knowledge (SMD 0.718, 95% CI -0.800 to 2.236, p = .23).

Conclusion: We demonstrated that psychoeducation did not improve adherence to diagnostic procedures and treatment, depression and BC knowledge but was valuable for reducing anxiety and improving QoL. Future studies may explore the effectiveness of psychoeducation in promoting adherence across various types of cancer.

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1. Introduction

Breast cancer (BC) is currently the most frequently diagnosed cancer in 154 of 185 countries worldwide [1] and it affects women’s health both physically and psychologically [2,3]. Throughout the BC care pathway, women may experience various psychosocial issues [4]. In the diagnostic phase, they report a lower QoL and health status than women in general [5], increased anxiety [6], and a lack of power to use resources (inability to pay for care, inability to access care) and social support [7]. During the treatment phase, women with BC may experience symptoms of anxiety and depression [8,9] due to the burden of treatment, and the uncertainties they face regarding recovery. Furthermore, in the survivorship phase (after completing curative primary treatment), the long-term side effects of cancer treatments may contribute to the poor QoL of BC survivors [10] and can also lead to psychological distress such as anxiety and depression [11].

Previous studies reported that over 75% of women with BC symptoms reported inadequate knowledge about BC and its treatment [11]. In the diagnostic phase, they report a lower QoL and health status than women in general [5], increased anxiety [6], and a lack of power to use resources (inability to pay for care, inability to access care) and social support [7]. During the treatment phase, women with BC may experience symptoms of anxiety and depression [8,9] due to the burden of treatment, and the uncertainties they face regarding recovery. Furthermore, in the survivorship phase (after completing curative primary treatment), the long-term side effects of cancer treatments may contribute to the poor QoL of BC survivors [10] and can also lead to psychological distress such as anxiety and depression [11].

Psychoeducation has emerged in practice as an adjunctive psychosocial intervention for cancer for both patients and families [17]. Psychoeducation refers to strategies that involve information giving and receiving, discussion of concerns, problem-solving, coping skills training, expression of emotions, and social support [18]. Psychoeducation may be helpful for women with BC symptoms or diagnosis, and after recovery from BC to adhere to medical procedures that enable a timely diagnosis and treatment [14,19]. Therefore, psychoeducation is expected to have beneficial effects in improving patients’ adherence to medical procedures throughout the BC care path. Further, it may help them cope with various challenges throughout the BC care time frame, reduce symptoms of anxiety and depression, and improve QoL [20–22]. Psychoeducation can be delivered in an individual format, in group format or in guided self-help format [23] over a number of weeks and may include information about cancer, treatment, coping strategies and complementary therapies [24]. Psychoeducation is scalable, since it is, more easily administered and potentially better accessible than conventional psychological interventions that require delivery by trained mental health professionals [25]. Psychoeducation, on the other hand, can be delivered by trained non-specialist health workers, or in a self-help format (e.g., printed materials, audio-visual materials, internet contents) which requires fewer resources.

Previous meta-analyses indicated that among patients with various types of cancer, psychoeducation is effective in reducing anxiety [26], depression [27], and in improving knowledge about cancer and its treatment [26]. Concerning QoL, results were inconclusive, with one meta-analysis across general cancer patients finding positive effects for psychoeducation [28] whereas another that focused only on BC patients did not find any positive effect on QoL [29].

Until now, no meta-analyses have examined the effect of psychoeducation on adherence to diagnostic and treatment procedures in women with BC symptoms. Further, the most recent meta-analysis on psychoeducation in BC was published in 2014 [29] and many new studies have appeared since then (e.g., 14, 20, 22). This is the first meta-analysis to investigate the effectiveness of psychoeducation on adherence to diagnostic procedures and medical treatment among patients with BC symptoms or diagnosis and BC survivors. Further, we examined the effects of psychoeducation on reductions in anxiety, depression, QoL, and on BC knowledge.

2. Method

2.1. Data sources and searches

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines throughout the design, conduct, and reporting of this review [30]. The study protocol was published on PROSPERO (registration number: CRD42020146320). To identify all relevant publications, we conducted systematic searches in the bibliographic databases PubMed, Embase.com and EbSCO/PsycINFO and Wiley/Cochrane Library from inception up to July 13, 2020, in collaboration with a medical information specialist. The following terms were used (including
synonyms and closely related words) as index terms or free-text words: “Breast Neoplasms”, “Psychotherapy”, “Psycho-education”, “Psycho-oncology”. The references of the identified articles were searched for relevant publications. Duplicate articles were excluded. The full search strategies for all databases can be found in Appendix A.

2.2. Study selection and data extraction

We used the Rayyan QCRI web application [31] for screening the articles. Two reviewers (HS and HA) independently screened the titles of articles identified in the searches and references and eliminated irrelevant studies. Next, they independently screened the abstracts of the remaining studies according to the inclusion criteria. A reference check was performed as well. Any disagreements were resolved by joint discussion, and if consensus was not reached, a third author (MS) was consulted for a joint final decision.

Studies were included if they met the following criteria (a): they were RCTs published in the English-language scientific peer-reviewed journals; (b); participants were patients with BC symptoms (define as patients who visited the healthcare professional with BC symptoms or who have received an abnormal mammogram before obtaining a definitive diagnosis), patients with BC diagnosis, and BC survivors (define as patients who completed curative primary BC treatments). We included all types of patients that underwent medical procedures from the diagnosis phase until the survivorship phase due to women experiencing various psychosocial concerns along the care path (c); studies evaluated a psychosocial intervention with a main focus on psychoeducation (including health educational, self-help, and self-management interventions) (d); the comparison control group was either treatment as usual, standard care or waiting list (e); at least one of the following outcomes was reported: adherence to medical procedures (defined as patient’s adherence to BC diagnosis and treatment procedures) was measured using a self-reported questionnaire or an interview to assess “adhere or non-adhere” to medical recommendations, anxiety (measured mainly by using BAI, HADS, STAI), depression (measured mainly by using, CES-D, HADS), QoL (measured by WHOQOL-BREF and EORTQOL-L C-30 as most used instruments), and BC knowledge (defined as patient’s knowledge related to BC) was measured using knowledge test that consists of items to assess patient’s knowledge related to BC. No restrictions were placed on the duration of the psychoeducational intervention.

The following descriptive data were extracted by the author (HS): (a) participants (women with BC symptoms, women with BC diagnosis, and women who completed curative primary BC treatments); (b) setting/recruitment; (c) interventions/groups (type of psychoeducation and control group); (d) number of participants; (e) duration of the intervention; (f) content of psychoeducation; and (g) measured outcomes. All descriptive data were checked by two independent bachelor-level research assistants. For the meta-analysis, two authors (HS and WY) independently extracted the outcome data, namely: (a) number of participants; (b) mean; (c) standard deviation.

2.3. Qualitative assessment of the risk of bias (RoB)

Risk of bias (RoB) was independently assessed by two researchers (HS and JH) with the Cochrane Collaboration’s tool for assessing RoB [32]. Disagreements were discussed and resolved mediated by a third researcher (JP). We evaluated sources of bias across seven domains: (a) random sequence generation; (b) allocation concealment; (c) blinding participant and personnel; (d) blinding of outcome assessment; (e) incomplete outcome data; (f) selective reporting; (g) other bias. These domains aimed to detect selection, performance, detection, attrition and reporting bias. We followed the criteria in the Cochrane Collaboration’s tool for assessing RoB for judging “high risk”, “low risk”, and “unclear risk”. In addition, studies with more than three high or unclear risk on the criterions were categorized as “high/unclear risk” and the others were categorized as “low risk studies”.

2.4. Meta-analysis

This meta-analysis consisted of two types of outcome data. First, since the adherence outcomes were binary outcome data, the risk ratios (RRs) were calculated by comparing the RR of those who adhere to the medical procedures in the psychoeducation groups versus those who were in the control groups. As recommended, the random-effects model using Mantel-Haenszel method was used to combine the RRs from all studies [33]. Second, anxiety, depression, QoL and BC knowledge scores were continuous outcome data. Thus, we used random-effects meta-analyses and the inverse variance method. The effect of psychoeducation was expressed as a standardized mean difference (SMD) and its 95% confidence interval (95% CI). The SMDs were used to handle the differences in measurement scale from various studies. The values were calculated based on the differences of mean and standard deviation between intervention and control groups. However, several studies reported median, range and interquartile range. To handle these cases, we estimated samples and standard deviations as proposed by Wan, Wang [34]. Moreover, we used the average effect sizes for the studies with more than one measures for the same outcomes [35]. Cohen’s d effect size guidelines [36] were used to interpret the SMD scores: 0.2 was considered a small, 0.5 a moderate, and 0.8 a large difference. We also calculated a test of homogeneity of effect sizes using I²-statistic, which quantifies the heterogeneity in percent-
ages. A value of <30%, 30–60%, and >60% was interpreted as low, moderate and high of heterogeneity, respectively [37].

In addition, subgroup analyses were conducted for subgroups with at least three studies. We compared the effect sizes between the following subgroups: patient status (BC patients vs. BC survivors), delivery format (individual vs. group and digital vs. face to face), type of guidance (self-help vs. helper-assisted), duration of the intervention (<8 weeks vs. ≥ 8 weeks), studies with high/un-
clear vs. low RoB, content (delivered within the context of Cognitive Behaviour Therapy (CBT) vs. other types of psychoeducation), and whether it provided by a single discipline or multidisciplinary professionals. All statistical analyses were conducted using the computer program R [38] with the meta package [39,40] following explanations from Harrer, Cuijpers [41].

3. Results

3.1. Selection and inclusion of studies

The literature search generated a total of 7530 publications: 1993 in PubMed, 3509 in Embase. com, 963 in APA PsyclINFO, 1064 in Cochrane Library and 1 additional record identified through reference checking. After removing duplicates and screening titles and abstracts, 54 studies were selected for full-text evaluation. Ultimately, 27 studies were included in the meta-analysis (see Fig. 1).

3.2. Characteristics of included studies

The 27 studies included a total of 7742 participants (3880 in the intervention groups and 3862 in the control groups). Table 1 summarises the selected characteristics of the included studies.

Two studies involved women with BC symptoms before
obtaining a definitive diagnosis, 13 studies involved patients with a diagnosis of BC, and 12 studies involved BC survivors (defined as patients who completed curative primary treatment). Patients were recruited from a clinic setting in 24 studies, and only three studies recruited participants in a non-clinical setting. Most studies (n = 25) were conducted in high-income countries (HIC). Fifteen studies compared psychoeducation to usual care, whereas nine studies included a waitlist control group, and three studies included a control group but did not specify the control condition (or the characteristic of the control group were not clear). Regarding the duration of the intervention, seventeen studies evaluated interventions taking eight weeks or more, whereas nine studies evaluated interventions of fewer than eight weeks. One study did not describe the intervention duration.

Two studies compared more than one type/format of psychoeducation to control: individual vs. group psychoeducation vs. control and videotape vs. face-to-face psychoeducation vs. control. Fourteen studies evaluated individual psychoeducation while fourteen used a group format. In terms of professional support, most studies (23 studies) evaluated a helper-assisted (defined as psychoeducation delivered or assisted by one or more professionals) intervention and five studies evaluated a self-help intervention. Most studies (21 studies) involved face-to-face psychoeducation, while the remaining seven studies utilised digital media (email, telephone, website, video).

The content of psychoeducation for women with BC symptoms included (a) BC symptoms and screening (2 studies); (b) promoting to continue the examination/diagnostic procedures (1 study); and (c) social support (1 study). Meanwhile, psychoeducation for BC patients consisted of: (a) information regarding BC (the medical aspect of their condition, including the treatment) (7 studies); (b) nutrition (1 study); (c) coping with BC (11 studies); (d) psychosocial support and use resources (7 studies). The content of psychoeducation for BC survivors was: (a) physical and psychological changes after treatment (8 studies); (b) diet and nutrition (2 studies); (c) coping and problem-solving (5 studies); (d) social support (1 study); (e) exercise or physical activities (4 studies).

Regarding outcomes measured, adherence to medical procedures was measured in three studies (4 comparisons), anxiety in fourteen studies (15 comparisons), depression in fifteen studies (19 comparisons), QoL in nineteen studies (21 comparisons) and BC knowledge in four studies (4 comparisons).

3.3. Quality of included studies based on the RoB tool

In total, 22 studies (81.5%) showed a high RoB on at least one criterion (Appendix B and Appendix C). The highest RoB was identified for the category 'other bias' (n = 19; 70.4%), while the lowest RoB was identified for 'incomplete outcome data' (n = 19; 70.4%) and 'selective reporting' (n = 19; 70.4%). Seventeen studies
| No | Studies | Participants | Setting | Intervention groups | N | Duration | Content | Format | Outcomes |
|----|---------|--------------|---------|---------------------|---|----------|---------|--------|----------|
| 1  | Admiraal et al., 2017 [42] | BC survivors | Clinic; NL (HIC) | Psychoeducation | 59 | 12 weeks | A web-based tailored psychoeducation that comprise background information about problems (including normalization), possible problem-solving strategies for coping, and resources including hyperlinks to other web sites and services (for self-referral). | Individual; Digital (internet); Self-help | QOL: QLQ-C30 |
| 2  | Ashing and Rosales, 2014 [43] | BC survivors | Non-clinic; US (HIC) | Telephone-based psychoeducational | 45 | 4 weeks (8 sessions) | Telephone-based psychoeducational which is grounded in the health-related QOL, the cognitive-behavioural framework and socio-ecological factors to promote resource utilization and a solution-focused, resilient orientation to coping with BC. | Individual; Digital (Telephone); Helper-assisted | Depression: CES-D |
| 3  | Boesen et al., 2011 [44] | BC patients | Clinic; DK (HIC) | Psychoeducation and Group psychotherapy | 89 | 10 weeks (10 sessions) | A group intervention to improve patients’ QOL; promoting a supportive environment, facilitating grief over multiple losses, altering maladaptive cognitive patterns, enhancing problem-solving and coping skills, fostering a sense of mastery and providing an opportunity to sort out priorities for the future. | Group; Face to face; Helper-assisted | Anxiety: POMS; Depression: POMS; QOL: EORTC |
| 4  | Chan et al., 2017 [20] | BC survivors | Clinic; SG (HIC) | Psychoeducation group | 34 | 3 weeks (3 sessions) | Psychoeducational group intervention based on the principles of cognitive behavioural therapy (CBT) to address and alleviate survivorship issues that they encounter after treatment. | Group; Face to face; Helper-assisted | Anxiety: Beck Anxiety Inventory; QOL: QLQ-C30 |
| 5  | Dastan and Buzlu, 2012 [45] | BC patients | Clinic; TR (LMIC) | Semi structured psychoeducation | 41 | 6 weeks (8 sessions) | A semi-structured “Psychoeducational Program” to provide education and support. Main content: basic | Group; Face to face; Helper-assisted | Anxiety: Mental Adjustment to Cancer Scale |
| Study | Participants | Setting | Intervention | Duration | Methodology | Measures | Control Group |
|-------|--------------|---------|--------------|----------|-------------|----------|---------------|
| 6     | David et al., 2011 [46] | BC patients | Non-Clinic; DE (HIC) | Online counselling - Psychoeducational intervention | 31 weeks | Individual; Digital; Helper-assisted | Anxiety: BSI; Depression: BSI; QOL: QLQ-C30 |
| 7     | Dolbeault et al., 2009 [47] | BC survivors | Clinic; FR (HIC) | Wait-list control - Psychoeducational group | 8 weeks (8 sessions) | Group; Face to face; Helper-assisted | Anxiety: STAI, POMS; Depression: POMS; QOL: QLQ-C30 |
| 8     | Edgar et al., 2001 [48] | BC patients | Clinic, CA (HIC) | Individual Nucare | 24 weeks (5 sessions) | Individual; Face to face; Helper-assisted | Depression: POMS; QOL: FACT |
| 9     | Fenlon et al., 2020 [49] | BC patients | Clinic, UK (HIC) | Group CBT | 6 weeks (6 sessions) | Group; Face to face; Helper-assisted | Anxiety: GAD-7; Depression: PHQ; |

(continued on next page)
| No | Studies | Participants | Setting | Intervention groups | N   | Duration | Content                                                                                                                                                                                                                                                                                                                                                                                                                                           | Format                                        | Outcomes                                      |
|----|---------|--------------|---------|---------------------|-----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| 10 | Fillion et al., 2008 [50] | BC survivors | Clinic CA (HIC) | Group Education Usual care | 44  | 4 weeks (4 sessions) | A brief group intervention that combines stress management psychoeducation and physical activity (i.e., independent variable) intervention in reducing fatigue and improving energy level, QOL (mental and physical), fitness (VO2submax), and emotional distress in BC survivors. The conventional medical follow-up for BC treatments. | Group; Face to face; Helper-assisted           | QOL: MOS SF-12                                |
|    |         |              |         |                     |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |                                               |
| 11 | Johns et al., 2020 [51] | BC survivors | Clinic; US (HIC) | Survivorship education | 32  | 6 weeks (6 sessions) | Survivorship education covering relevant survivorship topics: symptom management, weight management, physical activity, and survivorship care plan, didactic discussion guided by masters-level oncology social workers. Usual care 26 Standard care and received booklet entitled: facing forward: Life after cancer treatment, and list of supplemental resources. | Group; Face to face; Helper-assisted          | Anxiety: GAD; Depression: PHQ; QOL: PROMIS |
|    |         |              |         |                     |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |                                               |
| 12 | Jones et al., 2013 [52] | BC survivors | Clinic; CA (HIC) | Brief group psychoeducational | 190 | 12 weeks + 1 session (2 h) | GBOT: Life After Treatment - Group, brief group psychoeducation that covers: Nursing, Radiation Therapy; Physiotherapy, Nutrition, Social Work, and Occupational Therapy. Received Getting Back On Track (GBOT) book, contains information on what to expect after treatment and introduces self-management strategies to deal with physical, social, and psychological effect of breast cancer diagnosis and treatment, and list of community resources. | Group; Face to face; Helper-assisted          | BC knowledge: Knowledge regarding re-entry transition; |
|    |         |              |         |                     |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |                                               |
| 13 | Lerman et al., 1992 [19] | Patients with BC symptoms | Non-Clinic; US (HIC) | Psychoeducational booklet - positive framing | 94  | 12 weeks | Psychoeducation sent by email that described the meaning of abnormal mammograms and emphasized the necessity of continued screening (with positive framing). Psychoeducation sent by email that described the meaning of abnormal mammograms and emphasized the necessity of continued screening (with negative framing). The standard breast screening packet sent by email, which included the free mammogram referral. | Individual; Digital (Email); Self-help        | Adherence: Self-reported                     |
| Study | Group | Clinic Type | BC Education/Intervention | Duration | Setting | Description | Control | Measure | Comparator |
|-------|-------|-------------|---------------------------|----------|---------|-------------|---------|---------|------------|
| 14 Meneses et al., 2007 [53] | BC survivors | Clinic; US (HIC) | BC Education Intervention | 28 weeks (8 sessions) | | A psychoeducational support intervention designed for BC survivors and consists of three education and support sessions: education about physical changes after treatment; personal and emotional changes after BC and ways to maintain health; psychological distress and the spiritual effects of cancer and its treat. | Wait-list control | QOL: QOL-BC | |
| 15 Meneses et al., 2009 [54] | BC survivors | Clinic; US (HIC) | BC Education Intervention | 28 weeks (8 sessions) | | A psychoeducational support intervention designed specifically for BC survivors during post-treatment survivorship that consist of three sessions on: Physical wellbeing; psychological and social wellbeing; Spiritual wellbeing. | Wait-list control | QOL: QOL-BC | |
| 16 Park et al., 2012 [55] | BC survivors | Clinic; KR (HIC) | Psychoeducation support | 12 weeks (9 sessions) | | A psychoeducational support program which focused on helping women to prevent, identify, and resolve problems that they might confront after primary treatment of BC and to develop beneficial coping and management strategies. | Usual care | QOL: FACT-G | |
| 17 Park et al., 2020 [56] | BC patients | Clinic; JP (HIC) | Mindfulness-based cognitive therapy | 8 weeks (8 sessions) | | The program consisted of formal meditational exercises, psychoeducation based on cognitive therapy, and discussion and interaction among the participants to facilitate their learning | Group; Face to face; Helper-assisted | Anxiety: HADS; Depression: HADS | |
| 18 Ploos van Amstel et al., 2020 [57] | BC patients | Clinic; NL (HIC) | Wait-list control Nurse-led DT intervention-NDTI | 31 | | The NDTI comprised a discussion of the DT results by a study nurse. The intervention encompassed providing emotional support and education about cancer and its treatment. It also included giving practical advice on emotional, social, practical, and/or physical issues raised. Routine follow up visit with healthcare professionals. | Individual; Face to face; Helper-assisted | Anxiety: HADS; Depression: HADS | |

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| No | Studies | Participants | Setting | Intervention groups | N   | Duration | Content                                                                 | Format                        | Outcomes                        |
|----|---------|--------------|---------|---------------------|-----|----------|-------------------------------------------------------------------------|-------------------------------|---------------------------------|
| 19 | Ruiz-Vozmediano et al., 2020 [58] | BC survivors | Clinic; ES (HIC) | Multidisciplinary program | 31  | 24 weeks | Program on dietary habits, physical activity, and mindfulness received program on dietary, habits, physical activity, and mindfulness. | Group; Face to face; Helper-assisted | Adherence: Mediterranean Diet Adherence Screener (MEDAS); QOL: QLQ-C-30; Anxiety: HADS; Depression: HADS |
| 20 | Schou Bredal et al., 2014 [59] | BC patients | Clinic: NO (HIC) | Psychoeducation group | 185 | 5 weeks (5 sessions) 3 weeks (3 sessions) | Psychoeducational group that consist of: health education, stress management, enhancement of problem-solving skills, and psychological support. Support group that consists of 3 weekly 2-h sessions for encouraging patients to share their experiences and feelings. | Group; Face to face; Helper-assisted | Anxiety: HADS; Depression: HADS |
| 21 | Setyowibowo et al., 2020 [14] | BC symptoms | Clinic; IND (LMIC) | Self-help psychoeducation materials | 54  | 1 week | A self-help psychoeducational program, named PERANTARA to motivate of women with BC symptoms to comply with diagnostic procedures and to seek social support. It consists of printed material with information about symptoms and actions to be taken and of audiovisual material with testimonials of BC survivors. Consultations with an oncologist about medical examination procedures and an educational poster on the wall in the hospital waiting room. | Individual; Digital (DVD); Self-help | Adherence: Medical record; Anxiety: HADS; Depression: HADS; QOL: WHOQOL-Bref.; EQ5D5L; BC knowledge: BC Knowledge Test |
| 22 | Stanton et al., 2005 [60] | BC patients | Clinic; US (HIC) | Psychoeducational counselling -EDU | 143 | 2 weeks (2 sessions) | Individual psychoeducational intervention with 1 face-to-face session and 1 telephone session with trained cancer educators. Session 1: reviewing cancer-related concerns across physical health, emotional well-being, interpersonal relations, and life perspectives, develop action plan to address primary concern and associated. Session 2: evaluate progress on action plan, and address generalization of strategies to other challenges. | Individual; Face to face; Helper-assisted | Depression: CES-D; QOL: SF; |

Peer Modelling Videotape -VID | 139 | 1 session | A 23-min film addressing re-entry challenges in four life domains: physical health, emotional well-being, interpersonal relations, and life perspectives. Peer modelling by presenting four BC survivors describing their experiences and coping skills they used to meet challenges. | Individual; Digital (Video); Self-help |
| Study (Year) | Country | Intervention Type | Setting | Sessions | Duration | Language | Control Details | Outcomes | Notes |
|-------------|---------|-------------------|---------|----------|----------|----------|----------------|----------|-------|
| Stanzer et al., 2019 [61] | Austria (HIC) | Psychoeducational | Clinic; Austria (HIC) | 30 | 8 weeks (8 sessions) | Group; Face to face; Helper-assisted | Anxiety: STAI; Depression: BDI-II; QOL: EORTC-QLQ-C-30 | BC knowledge: BC-related knowledge | |
| Taylor et al., 2003 [62] | US (HIC) | Psychoeducational | Clinic; US (HIC) | 40 | 8 weeks (8 sessions) | Group; Face to face; Helper-assisted | Anxiety: STAI; Depression: BDI-II; QOL: EORTC-QLQ-C-30 | BC knowledge: BC-related knowledge | |
| Teo et al., 2020 [63] | US and SG (HIC) | Psychosocial | Clinic; US and SG (HIC) | 34 | 8 weeks (4 sessions) | Individual; Face to face; Helper-assisted | Anxiety: HADS; Depression: HADS | |
| van den Berg et al., 2015 [64] | NL (HIC) | BC E-Health | Clinic; NL (HIC) | 70 | 16 weeks | Individual; Digital; Self-help | QOL: EORTC QLQ-C30 | |
| Wu et al., 2018 [22] | CN (HIC) | Psychoeducation | Clinic; CN (HIC) | 20 | 18 weeks (6 sessions) | Individual; Face to face; Helper-assisted; | Anxiety: HADS; Depression: HADS; QOL: EORTC QLQ-C30; BC knowledge: the disease-specific care knowledge scale | |

Usual care 136 1 session
Usual care 20

The 43-page booklet contains general information for cancer survivors and focuses on health care after cancer treatments, managing emotions, and financial issues.

BC: Breast cancer; BDI-II: Beck depression inventory-II; BSI: Brief Symptom Inventory; CES-D: Center for Epidemiological Studies Depression; EORTC-QLQ-C-30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; FACT: Functional Assessment of Cancer Therapy; FACT-B: Functional Assessment of Cancer Therapy Breast questionnaire; GAD 7: General Anxiety Disorder-7; HADS: Hospital Anxiety and Depression Scale; HIC: High Income Countries; LMIC: Low - and Middle Income countries; MOS SF-12: Medical Outcomes Study Short Form 12; POMS: Profile of Mood States; PHQ: Patient Health Questionnaire-8; PROMIS: Patient-Reported Outcomes Measurement Information System; QOL: Quality of life; QOL-BC: the Quality of Life-BC Survivors; SF-36: Short Form-36 Vitality Subscale; STAI: State-Trait Anxiety Inventory; WHOQOL-BREF: World Health Organization Quality of Life- BREF.
(63%) were rated as low risk on at least three domains. On other potential sources of bias, nineteen studies (70.4%) were rated as high risk, seven studies (25.9%) were rated as unclear risk, and one study (3.7%) was rated as low risk. We also categorized every study into “low risk” vs “high/unclear risk”. The studies with more than three high or unclear risks on the criterions were categorized as “high/unclear risk” studies (n = 19, 70.4%) and the others were categorized into “low risk” studies (n = 8, 29.6%).

3.4. Meta-analysis

3.4.1. Adherence

Psychoeducation had no significant effect on adherence to the diagnostic and treatment procedures (4 comparisons, n = 555; RR 1.553; 95% CI 0.733 to 3.290, p = .16), with high heterogeneity (I² = 68%) (Fig. 2 and Table 2).

3.4.2. Mental health outcomes

Psychoeducation significantly decreased anxiety symptoms and the effect was moderate (15 comparisons, n = 1915; SMD -0.710, 95% CI -1.395 to −0.027, p = .04), with high heterogeneity (89.2%). (Fig. 3A and Table 2). The effect of psychoeducation on depression symptom was not significant (19 comparisons, n = 2250; SMD -0.243, 95% CI -0.580 to 0.091, p = .14), with high heterogeneity (I² = 82%), (Fig. 3B and Table 2). In addition, psychoeducation had a significant moderate effect on QoL (21 comparisons, n = 2425; SMD 0.509; 95% CI 0.096 to 0.923, p < .01; with high heterogeneity; I² = 91%), (Fig. 3C and Table 2).

3.4.3. BC knowledge

Psychoeducation did not have an effect on BC knowledge (4 comparisons, n = 597; SMD 0.718, 95% CI -0.800 to 2.236, p = .23; and heterogeneity was high, I² = 87%) (Fig. 4 and Table 2).

3.4.4. Subgroup analyses

The following subgroup comparisons were conducted, BC vs BS survivors, individual vs group intervention, face to face vs digital delivery, self-help vs helper-guided, low vs non-low risk of bias studies, duration of intervention <8 weeks vs ≥8 weeks, content (delivered within the context of CBT vs. other types of psycho-education), and helper-assisted (single discipline vs. multidisciplinary professionals). If subgroups consisted of less than three studies, no subgroup analysis was done. This was the case for comparisons between the self-help vs helper-assisted psycho-education for anxiety and depression, and face to face vs digital delivery for anxiety. Lastly, no subgroup analysis was done for BC knowledge as outcome, since the number of studies in one subgroup was less than three for all subgroup comparisons.

The result of subgroup analyses (Table 2) showed no significant differences in terms of patient status (BC patients vs BC survivors), delivery mode of the intervention (face to face vs digital, self-help vs helper-assisted, and individual vs group), low and non-low RoBi, the duration of the intervention (<8 vs ≥8 weeks), content (delivered within the context of CBT vs. other types of psycho-education), and helper-assisted (single discipline vs. multidisciplinary professionals) on adherence, anxiety, depression, QoL and BC knowledge. However, we found significant differences on depression when psychoeducation was delivered face-to-face (14 comparisons, n = 1607; SMD -0.389, 95% CI -0.832 to 0.054) than digitally (5 comparisons, n = 643; SMD -0.110, 95% CI -0.218 to 0.439; χ² = 4.45, p = .03). Furthermore, psychoeducation with ≥8 weeks duration had a higher effect on QoL (14 comparisons, n = 1463; SMD 0.695, 95% CI 0.07 to 1.319) than <8 weeks duration (6 comparisons, n = 875; SMD 0.1104, 95% CI -0.037 to 0.245, p = .04).

4. Discussion

This meta-analysis examined the effects of psychoeducation in patients with BC symptoms, BC diagnosis and BC survivors. The results showed that compared with control groups psychoeducation did not have a significant effect on improving adherence to medical procedures. However, psychoeducation significantly decreased anxiety and improved QoL, with moderate effect sizes. No effects were found for reducing depression and improving BC knowledge.

This is the first systematic review and meta-analysis that examined the effects of psychoeducation on adherence to medical recommendations from the first discovery of symptoms to the survivorship phase in BC patients. We found only three studies that included adherence to medical procedures as an outcome [14,19,58], which may explain the lack of finding a positive effect. A recent meta-analysis in patients with end-stage renal disease [65] and patients with coronary heart disease [66] indicated that psychoeducation has the potential to be utilised for enhancing adherence to medical treatment. In addition, the same might be the case for enhancing BC knowledge, the outcome for which only four studies could be included.

Our finding that psychoeducation reduced anxiety in BC is in line with the results of a previous meta-analysis showing positive effects of psychoeducation in reducing anxiety among various types of cancer [26,28]. Psychoeducation may alleviate anxiety by enabling patients to feel less isolated and find reassurance through social support while elevating their understanding of coping strategies, and teaching stress management strategies (breathing and relaxation exercises). We did not find a beneficial effect on
Table 2
Comparative effects (RR and SDMs) of psychoeducation versus control on adherence, anxiety, depression, Quality of Life, BC Knowledge both overall and for the subgroups.

| Variable                          | n-comp | RR    | 95% CI          | I²  | p   |
|----------------------------------|--------|-------|-----------------|-----|-----|
| **Adherence**                    | 4      | 1.553 | 0.733; 3.290    | 67.60 |     |
| All Studies                      | 15     | -0.711| -1.395 to -0.027| 89.20 |     |
| **Anxiety**                      | 11     | -0.674| -1.296 to -0.053| 89.36 | .65 |
| **Risk of Bias**                 | 3      | 1.37  | -7.808 to 0.067 | 92.96 |     |
| Individual versus Group          | 6      | -0.203| -0.595 to 0.19  | 45.53 | .11 |
| Group                            | 9      | -1.077| -2.273 to 0.119 | 93.23 |     |
| **Depression**                   | 11     | -0.784| -1.773 to 0.206 | 91.42 | .69 |
| **Duration of intervention**     | 6      | -0.306| -1.018 to 0.406 | 87.37 | .21 |
| <8 weeks                         | 8      | -1.107| -2.462 to 0.249 | 91.95 |     |
| **Content**                      | 9      | 0.624 | 1.444 to 0.195  | 91.51 | .72 |
| Non-CBT                          | 14     | -0.893| 2.605 to 0.819  | 85.17 |     |
| Helper-assisted/guided           | 8      | -0.366| -0.688 to -0.044| 49.79 | .17 |
| Multidiscipline                  | 6      | 1.44  | 3.411 to 0.531  | 95.45 |     |
| **All Studies**                  | 19     | -0.244| 0.58 to 0.092   | 82.07 |     |
| **Subgroup analyses**            |        |       |                 |     |     |
| Patient status                   |        |       |                 |     |     |
| BC                               | 11     | -0.365| -0.81 to 0.08   | 84.35 | .11 |
| BC Survivor                      | 4      | 0.102 | -0.552 to 0.756 | 79.17 |     |
| Individual versus Group          | 11     | 0.005 | -0.267 to 0.277 | 59.21 | .09 |
| Group                            | 9      | -0.574| -1.34 to 0.193  | 87.86 |     |
| Digital versus Face to Face      | 5      | 0.11  | -0.218 to 0.439 | 45.73 | .03*|
| Face to Face                     | 14     | -0.389| -0.833 to 0.054 | 84.49 |     |
| **Risk of Bias**                 | 13     | -0.205| -0.673 to 0.263 | 82.99 | .69 |
| High/Unclear Risk                | 6      | -0.329| -0.929 to 0.27  | 83.21 |     |
| **Duration of intervention**     | 8      | 0.019 | -0.197 to 0.236 | 57.64 | .08 |
| <8 weeks                         | 10     | -0.508| -1.158 to 0.141 | 87.68 |     |
| **Content**                      | 9      | -0.418| -1.092 to 0.256 | 86.12 | .35 |
| Non-CBT                          | 10     | -0.102| -0.475 to 0.271 | 78.85 |     |
| Helper-assisted/guided           | 10     | -0.199| -0.581 to 0.183 | 76.85 | .37 |
| Multidiscipline                  | 7      | -0.399| -1.351 to 0.553 | 89.23 |     |
| **Quality of Life**              | 21     | 0.509 | 0.096 to 0.923  | 91.34 |     |
| **All Studies**                  | 10     | 0.695 | 0.036 to 1.355  | 87.83 | .45 |
| **Subgroup analyses**            |        |       |                 |     |     |
| BC                               | 10     | 0.380 | -0.303 to 1.062 | 93.82 |     |
| BC Survivor                      | 12     | 0.569 | -0.036 to 1.175 | 93.77 | .74 |
| Individual versus Group          | 9      | 0.432 | -0.259 to 1.123 | 85.21 |     |
| **Self-help versus Leader Guided**| 4    | 0.560 | -0.934 to 2.053 | 96.57 | .91 |
| **Digital versus Face to Face**  | 5      | 0.487 | -0.545 to 1.52  | 95.42 | .94 |
| Face to Face                     | 16     | 0.520 | 0.007 to 1.033  | 89.53 |     |
| **Risk of Bias**                 | 12     | 0.477 | -0.145 to 1.098 | 89.59 | .84 |
| High/Unclear Risk                | 9      | 0.559 | -0.11 to 1.228  | 92.66 |     |
| **Duration of intervention**     | 6      | 0.104 | -0.031 to 0.245 | 5.34  | .04*|
| <8 weeks                         | 14     | 0.695 | 0.07 to 1.319   | 93.90 |     |
| **Content**                      | 14     | 0.512 | -0.084 to 1.108 | 90.57 | .97 |
| Non-CBT                          | 7      | 0.525 | -0.122 to 1.172 | 91.82 |     |
| Helper-assisted/guided           | 7      | 0.525 | -0.122 to 1.172 | 91.82 |     |

(continued on next page)

We found evidence for an effect of psychoeducation on QoL, in contrast with a previous meta-analysis on psychoeducation for women with early-stage BC that found only an effect of psychoeducation on the BC Symptoms subscale but not on global QoL [29]. However, the Matsuda, Yamaoka [29] study included only eight studies that evaluated QoL, whereas we were able to include eighteen studies evaluating QoL in our more recent meta-analysis. A reasonable explanation is that psychoeducation promoted QoL by helping participants to manage their BC-related problems, taught stress management strategies (breathing and relaxation exercises) and taught adaptive strategies for coping with BC. Interestingly, subgroup analyses showed that the delivery format of psychoeducation (face-to-face or digital) had a differential effect in terms of reducing depression, with the strongest reduction in depression found for the face-to-face format. These results should be interpreted with caution due to the fact that study sample sizes were very different (digital n = 5 comparisons vs. face to face = 14 comparisons). The digital interventions included both web-based and phone-based interventions. This may partially be explained since drop-out within the digital psychoeducation (up to 33%) was slightly higher than in the face-to-face psychoeducation (up to 24%). Attrition is a common problem in e-health interventions [69], and for patients with BC it may be more feasible to integrate psychoeducation into the regular psychosocial care delivered at the hospital instead of offering it digitally or remotely. Another explanation for reduced effectiveness of digital delivery of psychoeducation may be that patients with BC, who are more often middle-aged than young women, may not all have optimal digital proficiency. However, it should be noted that a previous meta-analysis showed no indication for a difference in efficacy between guided self-help and face-to-face interventions for depression [70]. Furthermore, face-to-face interventions are generally more time-consuming and costly than self-help interventions [71]. Several digital formats have been utilised to provide psychoeducation for patients with cancer [27], and these remain promising alternatives that deserve further evaluations.

Another subgroup finding was that psychoeducation with more than eight sessions had a higher effect in improving QoL than fewer than eight sessions. It is not surprising that longer interventions have stronger effects from the perspective of a dose-effect relationship (the higher the dose, the more effect). Given that more sessions also require more effort and the requirement of more resources, a careful balance should be found between providing the...
Fig. 3. Standardized effect sizes between psychoeducation for BC compared to control on mental health outcomes.
most optimal and effective intensity of psychoeducation, while remaining its feasibility and acceptability for the individual patient. The optimal intensity may also be different for the different phases of BC diagnosis and treatment.

Various health professionals delivered psychoeducation with helper-assisted (or guided) format. This variety impeded a statistical comparison between the different types of health professionals. However, we compared the effect of psychoeducation delivered or assisted by a single discipline versus a multidisciplinary professional on anxiety, depression, and quality of life. This sub-group analysis indicated no differences between psychoeducation delivered by a single discipline or multidisciplinary professionals on any of these outcomes. Moreover, we found no differences between psychoeducation within a CBT framework vs. other types of psychoeducation on anxiety, depression, and quality of life.

4.1. Study limitations

This meta-analysis has a few limitations. First, the included studies showed a large variation in quality, and most of them were rated as having a high or unclear risk of bias, the latter meaning that authors did not provide sufficient information to decide whether a measure to reduce bias was taken. Other limitations of our study are the high heterogeneity between the studies, the variety in terms of contents of psychoeducation that might have affected the results of the review, the limited number of studies that assessed adherence and BC knowledge which may have limited statistical power, and the different outcome measures for assessing anxiety, depression, QoL, and BC knowledge across studies. Furthermore, most studies were conducted in HICs and their outcomes might not be translated to LMICs, due to the differences between settings in health facilities, access to health services, and differences in local concepts and idioms of distress.

4.2. Clinical implications

In clinical practice, psychoeducation is a crucial tool to reduce anxiety and improve QoL, and there is enough reason to promote the wide-scale use of psychoeducation in BC. When offered as a face-to-face, integrated into or added-on to clinical care, its effects may be most optimal. Further, its content may be adapted to the BC care stage of patients. Women with early symptoms of BC may benefit from psychoeducational strategies that promote adherence to diagnostic and treatment procedures, whereas at later stages in the BC care path psychoeducation may be targeted at promoting wellbeing, recovery and quality of life. To improve the effectiveness of psychoeducation on promoting adherence, we suggest that psychoeducation should be targeted to address the variety of concerns that women present with throughout the BC care path: from the early discovery of BC symptoms to the recovery phases. Psychoeducation should be delivered in multiple sessions and the delivery method should be adapted to fit in with the local context, and may include group discussions, individual consultations, or audio-visual or interactive materials. Further, effective strategies (e.g., supporting behavioural activation) should be added to address depression symptoms.

4.3. Research implications

For future studies, we recommend evaluating the effectiveness of psychoeducation in promoting adherence to medical procedures and reducing depression across various types of cancer and its long-term effects. In addition, research is needed into which elements of an intervention contribute to promoting adherence. Further, studies may evaluate the optimal dosage of psychoeducation. Although we found that psychoeducation of a longer duration was more effective in improving QoL, lengthy interventions may not be feasible or acceptable for BC patients and may not be scalable. The minimum required intensity of psychoeducation to effectively promote adherence and reduce distress including anxiety and depression deserves further investigation.

5. Conclusion

This review indicates that psychoeducation is a promising intervention to help patients throughout the BC care pathway. While finding no effects for improving adherence to diagnosis and treatment, as well as depression and BC knowledge, this meta-analysis shows that psychoeducation, especially when delivered face-to-face and over an extended duration, was effective in reducing anxiety and improving QoL.

Ethical approval

Approval was not required.

Declaration of interest

The authors have no conflicts to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.breast.2022.01.005.

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