Effects of the appearance care on psychosocial outcomes for breast cancer: a systematic review and meta-analysis

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Abstract

Purpose To synthesize the evidence for the immediate and short-term effects of appearance care on psychosocial outcomes in breast cancer patients in order to inform the design of future research and clinical practice.

Methods A search of four databases (PubMed, Embase, Cochrane Central Register of Controlled Trials, and Web of Science). The JBI Critical Appraisal Checklists were used by two reviewers to assess methodology quality. Subgroup analysis was conducted for the different time points measured after intervention.

Results Seven studies were eligible for the meta-analysis, including two RCTs and five quasi-experimental studies, from 1994 to 2022. The type of intervention was mainly grouped education, led by beauty specialists, and the dose and frequency varied. The quality of included studies was moderate to high. The results showed that appearance care had positive immediate effect on self-esteem (SMD = 0.63, 95% CI 0.37 to 0.89), anxiety (SMD = −0.46, 95% CI −0.60 to −0.31), and depression (SMD = −0.41, 95% CI −0.62 to −0.19), with short-term effects on anxiety (SMD = −0.42, 95% CI −0.54 to −0.34), depression (SMD = −0.41, 95% CI −0.55 to −0.26), and sexual function (SMD = 0.50, 95% CI 0.18 to 0.81). The effect of appearance care on body image and quality of life was uncertain.

Conclusion Appearance care could be a promising intervention to improve self-esteem, anxiety, depression, and sexual function among patients with breast cancer. More high-quality RCTs are needed to validate these findings. Online appearance care programs and exploration of long-term effects should also be considered.

Keywords Appearance care · Self-esteem · Anxiety and depression · Sexual function · Body image · Quality of life

Introduction

Breast cancer is the most common cancer worldwide that threatens women’s health [1]. Meanwhile, the survival rate of breast cancer patients increased significantly, due to a gradual improvement in screening, diagnostic, and therapeutic technology. In the long-term survival process, how to maintain psychosocial well-being of breast cancer patients has become the focus of the nursing staff.

At present, surgery combined with possible radiotherapy and chemotherapy is still the preferred treatment for breast cancer patients. Receiving these treatments is associated with negative body image, such as breast loss, hair loss, and skin damage. These changes and losses in appearance can lead to cognitive, behavioral, and emotional changes, and a perceived loss of femininity and attractiveness, which can affect their self-esteem and quality of life [2–5], and also it will negatively affect the well-being of couples and lead to sexual disorders [6, 7]. Therefore, there is a need to provide support for the appearance-related side effects of treatment to maintain their psychosocial well-being.

The current interventions on appearance-related side effects of breast cancer survivors mainly focus on cognitive-behavioral therapy [8], health education [9], exercise therapy [10, 11], support group intervention [12], and marital
therapy [13]. However, there is no consensus on whether these interventions improve appearance-related side effects, and most psychological interventions do not specifically focus on them, which are often addressed as a small part of larger interventions.

Appearance care is designed to teach makeup techniques and camouflage strategies in response to changes in appearance [14], which act directly on appearance-related side effects. Appearance care is particularly promising as a simple, convenient, and economical method that also does not require technologically advanced equipment. Given the important impact of appearance-related side effect on the psychosocial well-being of patients with breast cancer, increasingly researchers explored the effectiveness on appearance care on psychosocial outcomes. Studies have shown that targeted appearance care for breast cancer patients can effectively reduce body image disturbance [15], improve sexual function [15], self-esteem [14, 16–19], anxiety and depression [15–19], and quality of life [14, 19, 20]. However, there are also studies with different results [21, 22]. Since the inconsistent results and unknown magnitude of effects, a systematic review of the existing evidence is warranted to enable informed decisions about the clinical implications and further research orientation. Thus, this systematic review and meta-analysis aims to synthesize the evidence for the effects of appearance care on psychosocial outcomes, including but not limited to body image, self-esteem, anxiety, depression, quality of life, and sexual function.

Materials and methods

Literature search strategy

There was no registration for the review and no protocol. A thorough search was performed on the databases PubMed, Embase, Cochrane Central Register of Controlled Trials, and Web Of Science from database establishment until March 2022 for the following terms:

(1) Breast Neoplasm OR Breast Tumor* OR Breast Cancer
(2) Appearance Care OR Cosmetic Care OR Beauty Care OR Beauty Treatment OR Cosmetic Class OR Make-up OR Camouflage OR Aesthetics

The terms related to (1) and (2) were combined to perform the research. The search was limited to experimental study published in English.

Inclusion and exclusion criteria

Clinical trials (including RCTs and quasi-experimental studies) of breast cancer patients were included. The intervention measures in the intervention group involved appearance care or related interventions. The intervention measures in the possible control groups were usual care or no control. The outcome indicators of each study had psychosocial outcomes, such as body image, self-esteem, depression, anxiety, sexual function, and quality of life. Other exclusion criteria were as follows: reviews, comments, and letters, and no data or incomplete data.

Appraisal of included studies

The JBI Critical Appraisal Checklists for RCTs and for quasi-experimental studies were used to assess the methodological quality of the included studies [23]. The checklist for RCTs includes 13 items and for quasi-experimental studies includes 9 items. Each checklist was rated “Yes,” “No,” “Unclear,” or “Not Applicable.” The appraisal process was performed independently by two reviewers. Disagreements were resolved by a discussion with a third reviewer. While there was no consensus on determining the cutoff point for inclusion of papers after methodological evaluation, it was generally accepted that, if included, at least 50% of the evaluation criteria were met [24].

Study selection and data extraction

EndnoteX9 was used to collect and screen literature. First, we removed the duplicate literature retrieved from the four databases. Studies were initially screened by title and abstract. Then, the full text was read to assess eligibility for inclusion. When duplicate articles from the same institution were reported, either the better quality or most recent publication was included. We extracted data and recorded the information: (1) the first author, the year of publication, and the country; (2) study type; (3) study setting; (4) sample size; (5) sample characteristic; (6) intervention type, components, dosage, and mode; (7) facilitators; (8) outcome measures; (9) duration of follow-up; and (10) results. Meanwhile, we extracted data for calculating the effect size. In studies without a control group, the pre-intervention time point was considered a control. The study selection and data extraction process were performed independently by two reviewers. Disagreements were resolved by a discussion with a third reviewer.

Data synthesis

Rev Man 5.4.1 was used for data analysis. If $P > 0.1$ or $I^2 < 50\%$, multiple studies were considered to be homogeneous, and a fixed effect model was used; otherwise, a random effect model was selected. When the results were measured using the same scale or assessment tool, the weighted mean differences (MD) were compared;
otherwise, the standardized mean differences (SMD) were compared. The corresponding 95% confidence interval (CI) was calculated. For those studies that did not provide eligible data, descriptive analyses were used. Based on the time point of measurement after the intervention, the immediate post-intervention measurement was referred to as the immediate effect, and the 1–3 months post-intervention measurement was referred to as the short-term effect, in which context a subgroup analysis was applied. Effect sizes were determined according to the Cohen guidelines, with 0.2 considered a small effect; 0.5, moderate; and 0.8, large [25].

Results

As shown in Fig. 1, a systematic search yielded 1930 articles. After removing 485 duplicates, 1445 papers were left for the title and abstract screening, and 1046 records that did not meet the inclusion criteria were further removed. Then, 39 full-text articles were reviewed, and 25 studies that were found not to meet the inclusion criteria were further excluded. Subsequently, 7 studies were rejected due to qualitative studies, the same authorship, or incomplete data, or the population was not breast cancer. Finally, this systematic review included 7 articles, including 2 RCTs and 5 quasi-experimental studies. Two studies [19, 20] with incomplete data were descriptive.

Fig. 1 PRISMA Flow Diagram

Records identified from:
Databases (n = 1930)
Registers (n = 0)

Records removed before screening:
Duplicate records removed (n = 485)

Records screened (n = 1445)

Records excluded (n = 1046)

Reports sought for retrieval (n = 39)

Reports not retrieved (n = 25)

Reports assessed for eligibility (n = 14)

Reports excluded:
Qualitative research (n = 2)
Same author (n = 2)
Incomplete data (n = 2)
Not breast cancer (n = 1)

Studies included in review (n = 7)
Study characteristics

The studies were published between 1994 and 2022 (Table 1). The studies were conducted in six countries such as Japan [14], Korea [15, 22], Brazil [16], Italy [17], the USA [18], and France [21]. The trials comprised 675 breast cancer patients, sample size ranged from 55 to 152. Effects were described according to outcome measures including body image (six studies) [15–18, 21, 22], anxiety (six studies) [15–18, 21, 22], depression (five studies) [15–18, 21, 22], sexual function (two studies) [15, 22], and quality of life (two studies) [14, 17].

Participant characteristics

All studies focused on patients during treatment or recovery period. The studies by Ikeda (2020) (31%) [14], Panissi (2021) (16.5%) [16], and Di Mattei (2017) (25%) [17] had a small number of patients who had not undergone surgery. Besides, participants of the remaining study were postsurgical breast cancer patients, including patients who will be having, who are having, or who had completed adjuvant therapy.

Intervention characteristics

The types of interventions were mainly education program. Among them, one study (Kang, 2022) [15] combined psychological intervention, while one study (Quintard, 2008) [21] adopted only cosmetic treatment. The intervention components were mainly to teach makeup techniques and camouflage strategies, including wigs and eyebrows. The number of interventions varied from 1 to 4 times, the duration varied from 1 day to 4 weeks, and the total duration varied from 2 to 16 h. The intervention mode was mainly face-to-face group, while only one study (Quintard, 2008) [21] adopted one-to-one treatment. Interventions were mainly performed by cosmetic specialists, with only two studies (Ikeda, 2020; Kang, 2022) [14, 15] involving oncology nurse specialists.

Effect of appearance care on psychosocial outcomes

Body image

Body image was evaluated in six studies [15–18, 21, 22] involving 686 participants. Eight instruments were used to measure body image level: the Body-Image Questionnaire; the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Breast cancer module (EORTCQLQ-BR23); the Body Image Scale (Hopwood et al., 2001); the Body Image States Scale; Body Cathexis Scale; Body Image Scale (Leon et al., 1979); Body Parts Satisfaction Scale; and a 10-point scale.

Among the studies, five studies [16–18, 21, 22] assessed the immediate effect of appearance care on body image, and only two studies [17, 18] generated a significant result. Five studies were eligible for meta-analysis without showing an overall statistically significant effect on body image ($SMD=0.25$, 95% CI $-0.18$ to $0.68$, $P=0.26$, $I^2=89\%$).

Five studies [15–17, 21, 22] assessed the short-term effects of appearance care on body image, and three studies [15–17] generated a significant result. Five studies were eligible for meta-analysis without showing an overall statistically significant effect on body image ($SMD=0.03$, 95% CI $-0.35$ to $0.40$, $P=0.89$, $I^2=85\%$) (Fig. 2).

Self-esteem

Self-esteem was evaluated in 5 studies [14, 16–18, 22] involving 476 participants. All studies used the Rosenberg Self-Esteem Scale.

Among the studies, four studies [14, 17, 18, 22] assessed the immediate effect of appearance care on self-esteem, and only one study [18] generated a significant result. Four studies were eligible for meta-analysis showing an effect of appearance care on self-esteem ($MD=0.63$, 95% CI $0.37$ to $0.89$, $P<0.00001$, $I^2=0\%$).

Four studies [14, 16, 17, 22] assessed the short-term effects of appearance care on self-esteem, and two studies [16, 17] generated a significant result. Four studies were eligible for meta-analysis without showing an overall statistically significant effect on self-esteem ($MD=0.08$, 95% CI $0.20$ to $0.36$, $P=0.58$, $I^2=90\%$) (Fig. 3).

Anxiety

Anxiety was evaluated in six studies [15–18, 21, 22] involving 620 participants. Three instruments were used to measure anxiety level: the Hospital Anxiety and Depression Scale (HADS), the Beck Depression Inventory-II, and the Visual Analogue Scale (VAS).

Among the studies, five studies [16–18, 21, 22] assessed the immediate effect of appearance care on anxiety, and four studies [16–18, 22] generated a significant result. Four studies were eligible for meta-analysis showing a small effect of appearance care on anxiety ($SMD=-0.46$, 95% CI $-0.60$ to $-0.31$, $P<0.00001$, $I^2=43\%$).

Five studies [15–17, 21, 22] assessed the short-term effect of appearance care on anxiety, and four studies [15–17, 22] generated a significant result. Five studies were eligible for meta-analysis showing a small effect of appearance care on anxiety ($SMD=-0.42$, 95% CI $-0.54$ to $-0.34$, $P<0.00001$, $I^2=22\%$) (Supplementary Fig. 1).
| No | First author, year, country | Study type | Study setting | Sample size IG/CG | Sample characteristic | Intervention type, components, dosage and mode | Facilitators | Outcome measures | Duration of follow-up | Results |
|----|-----------------------------|------------|---------------|-------------------|-----------------------|-----------------------------------------------|-------------|-----------------|---------------------|---------|
| 1  | Kang D, 2022, Korea         | RCT        | Hospital      | 99 (46/53)        | Postsurgical breast cancer patients and chemotherapy and/or radiotherapy within 18 months | Type: structured education program Components: 1 h for mind control and 1 h for appearance management Dosage: 4 weeks; 2 h/week Mode: face-to-face, group | Oncology nurse specialists, beauty specialists, clinical psychologists, breast cancer survivors | EORTC QLQ-BR23; HADS; 10-point scale | 1 month T0: baseline T1: 1 month after the intervention | T0–T1: Compared with the CG, the body image level \( (P<0.01) \) and sexual satisfaction \( (P<0.01) \) of the experimental group were significantly increased, the body image distress \( (P<0.01) \), and the level of depression was decreased \( (P<0.01) \). No significant effect on depression |
| 2  | Panissi KC, 2021, Brazil    | One-armed non-RCT | Hospital      | 152               | Current outpatient treatment for breast cancer | Type: self-makeup workshops Components: hide the visible side effects, such as hair loss and skin spots Dosage: once, 3 h Mode: face-to-face, group | Hairdressers and makeup artists | BISS; HADS; RSES; | 1 month T0: baseline T1: right after the intervention T2: 1 month after the intervention | T0–T1: Compared with the baseline, the anxiety \( (P<0.001) \) was significantly decreased. No significant effect on depression, self-esteem, BISS T0–T2: Compared with the baseline, the anxiety \( (P<0.001) \), depression \( (P=0.001) \) were significantly decreased, self-esteem \( (P<0.001) \), BISS body image satisfaction \( (P<0.001) \), and BISS-appearance satisfaction \( (P<0.001) \) were significantly increased. No significant effect on BISS-weight concerns |
Table 1 (continued)

| No | First author, year, country | Study type | Study setting | Sample size | Sample characteristic | Intervention type, components, dosage and mode | Facilitators | Outcome measures | Duration of follow-up | Results |
|----|-----------------------------|------------|---------------|-------------|-----------------------|---------------------------------------------|--------------|------------------|-----------------------|---------|
| 3  | Ikeda M, 2020, Japan        | One-group pretest–posttest study | Hospital    | 55          | Breast cancer patients who were being, or planned to be, treated by chemotherapy, or who had finished chemotherapy, within the past 6 months | Type: appearance care program Components: lecture and a group discussion Dosage: 3 sessions Mode: face-to-face, group | Oncology nurses, clinical psychologists, licensed beauticians | RSES; FACT-B; Skindex-16 | 1 month | T0–T1: Compared with the baseline, all subscale scores of the Skindex-16 and quality of life ($P=0.034$) were significantly increased No significant effect on self-esteem T0–T2: Compared with the baseline, all subscale scores of the Skindex-16 was significantly increased No significant effect on self-esteem and quality |
| 4  | Di Mattei VE, 2017, Italy   | One-group pretest–posttest study | Hospital    | 88          | Breast cancer patients who underwent chemotherapy | Type: appearance management Components: makeup and wig tutorial, educational and a practical tutorial, group discussion Dosage: 3 sessions Mode: face-to-face, group | Makeup artist, wig expert, oncology estheticians, psychologists | BIS; BDI-II; STAI-Y; EORTC QLQ-C30; RSES | 3 months | T0–T1: Compared with the baseline, the anxiety ($P<0.001$), depression ($P<0.001$), and body image concerns ($P<0.001$) was significantly decreased No significant effect on quality of life and self-esteem T0–T2: Compared with the baseline, the anxiety ($P<0.001$), depression ($P<0.005$), and body image concerns ($P<0.001$) was significantly decreased, the level of self-esteem was increased ($P<0.01$) No significant effect on quality of life |
| No | First author, year, country | Study type | Study setting | Sample size | Sample characteristic | Intervention type, components, dosage and mode | Facilitators | Outcome measures | Duration of follow-up | Results |
|----|-----------------------------|------------|---------------|-------------|-----------------------|-----------------------------------------------|-------------|-----------------|---------------------|---------|
| 5  | Park HY, 2015, Korea        | Two-armed non-RCT | Hospital     | 60 (31/29)  | Postsurgical breast cancer patients in 2 years and were subsequently being treated with chemotherapy or radiation therapy | Type: cosmetics education program Components: skin care, facial massage, applying makeup, hair care for depilation, and dressing strategies Dosage: 2 h Mode: face-to-face, group | Professional beauty specialists | BCS; HADS; RSES; ASSS; MAC; DSFI | 1 month T0: baseline T1: right after the intervention T2: 1 month after the intervention | T0–T1: Compared with the CG, the anxiety and depression ($P=0.001$) were significantly decreased, the DSFI, GSSI scores, body satisfaction ($P=0.035$), and perceived level of social support ($P=0.014$) were significantly increased No significant effect on coping style and self-esteem T0–T2: Compared with the control group, the DSFI, GSSI scores were significantly increased No significant effect on coping style, self-esteem, anxiety and depression, social support, and body image |
| 6  | Quintard B, 2008, France    | RCT        | Hospital     | 100 (50/50) | Postsurgical breast cancer patients | Type: beauty treatments Components: manicure, pedicure, makeup, depilation, hairdressing (one day post-surgery), body massage (3 days post-surgery), and facial massage (5 days post-surgery) Dosage: 3 sessions Mode: face-to-face, individual | Professional beauty specialists | BIC; HADS; MAC | 3 months T0: before surgery T1: 6 days post-surgery T2: 3 months later | T0–T1, T0–T2: No significant effect on body image, anxiety and depression, and coping style |
Depression was evaluated in five studies [15–17, 21, 22] involving 499 participants. Three instruments were used to measure anxiety level: HADS, the State-Trait Anxiety Inventory-Y Form, and VAS. Among the studies, four studies [16, 17, 21, 22] assessed the immediate effect of appearance care on depression, and two studies [17, 22] generated a significant result. Four studies were eligible for meta-analysis showing a small effect of appearance care on depression (SMD = −0.41, 95% CI −0.62 to −0.19, P = 0.0001, I² = 0%). All five studies [15–17, 21, 22] assessed the short-term effect of appearance care on depression, and four studies [15–17, 22] generated a significant result. Five studies were eligible for meta-analysis showing a small effect of appearance care on depression (SMD = −0.41, 95% CI −0.55 to −0.26, P < 0.00001, I² = 0%) (Supplementary Fig. 2).

Sexual function

Sexual function was evaluated in 2 studies [15, 22] involving 159 participants. Two instruments were used to measure sexual function: the Derogatis Sexual Functioning Inventory and EORTCQLQ-BR23. Only one study [22] assessed the immediate effect of appearance care on sexual function, showing a significant result. While both two studies [15, 22] assessed the short-term effect of appearance care on sexual function, all generated a significant result. Two studies were eligible for meta-analysis showing a moderate effect of appearance care on sexual function (SMD = 0.50, 95% CI 0.18 to 0.81, P = 0.002, I² = 0%) (Supplementary Fig. 3).

Quality of life

Quality of life was evaluated in 2 studies [14, 17] involving 143 participants. Three instruments were used to measure quality of life level: Functional Assessment of Cancer Therapy-General and EORTCQLQ-C30 and Skindex-16. Among the studies, two studies [14, 17] assessed both the immediate and short-term effect of appearance care on quality of life. Two tools of one study [14] generated a significant result on immediate effect, and Skindex-16 of one study [14] generated a significant result on short-term effect. Two studies were eligible for meta-analysis without showing an overall statistically immediate (SMD = 0.82, 95% CI 0.14 to 1.78, P = 0.10, I² = 95%) and short-term (SMD = −0.08, 95% CI −1.33 to 1.18, P = 0.91, I² = 97%) significant effect on quality of life (Supplementary Fig. 4).
Other outcomes

Some studies assessed the effect of appearance care on happiness [18], attractiveness [18], social support [22], and coping style [21, 22], and the results showed appearance care had a significant short-term effect on happiness and attractiveness, while the immediate and short-term effects of social support and coping style were not significant.

Sensitivity analysis

The included studies were deleted one by one for sensitivity analysis to evaluate the impact of a single study on the combined effect size. The results did not change substantially. That was to say the meta-analysis results were relatively robust.

Publication bias

Given that no pooled analysis combined more than 10 studies, publication bias was not assessed [26].

Critical appraisal result and quality of evidence

All studies scored at least 50% on the JBI checklist and were therefore included in this systematic review. Among the RCTs, the study (Kang, 2022) blinding of intervention practitioners and outcome assessors could not be achieved, and other items were scored as “yes.” The study (Quintard, 2008) had five items (1–2, 4–6) that were all scored as “unclear.” In quasi-experimental studies (Sharon L, 1994 and Park HY, 2015), all applicable items were scored “yes;” three pre- and post-test studies (Panissi KC, 2021; Ikeda M, 2020; Di Mattei VE, 2017) failed to achieve to set up the control group (item 4), and all remaining applicable items were scored “yes.” The quality assessment results for the RCTs and the quasi-experimental are presented in Table 2 and Table 3.

Discussion

To the best of our knowledge, this systematic review and meta-analysis is the first to examine the effectiveness of appearance care on psychosocial outcomes of breast cancer patients.

The review revealed that there were significant immediate and short-term effects of appearance care on anxiety and depression. Appearance care had beneficial psychological effects on mood [27]. The facilitators taught patients makeup skills to bring their female image closer to their ideal image and increase self-image satisfaction, which led to changes in an emotional state. Plus, what these interventions had in common was that they all allowed participants to practice makeup skills, take photos as souvenirs if necessary, and stimulate a positive emotional response to their makeup-beautiful selves. Except for the study (Quintard, 2008) [21], other studies set up group discussions, sharing experiences, and mutual support with patients who had experienced the same, and could also promote positive emotional changes. Future interventions targeting negative emotions could take into account appearance care programs.

The review also showed that there were significant immediate and short-term effects of appearance care on sexual function. Appearance care can be a necessary first step in resolving intimacy problems. Since body image strongly interfered with sexual function in patients [28], related changes in body image could affect sexual function. During treatment period, the patient perceived a decrease in sexual unattractiveness due to the change in appearance, and appearance care could prompt them to face the change in appearance. However, relevant changes in the body included not only externally visible changes (hair loss, scarring, etc.) but also internal changes (such as perceptions about sex) [29]. It was suggested that sexual function must be considered a variable related to cosmetic care planning evaluation. In addition, patients who felt supported by their spouses had good overall sexual function [28]. It was recommended that spousal-involved psychosexual interventions be introduced appropriately in future appearance care to achieve better results.

The review also showed that there was significant immediate effect of appearance care on self-esteem, without short-term effect. Self-esteem entails individual respect and the value attributed to oneself [22]. When receiving appearance care, patients were given the opportunity to re-examine themselves [14], resulting in an immediate increase in self-esteem. However, self-esteem was considered a personal trait, and after participating in a brief, low-dose appearance management program, patients’ compliance with appearance self-management might not be high, thus affecting the long-term effect of the intervention. In the future, we need to take into account monitoring of participants’ adherence to appearance management in lieu of simple follow-up. When necessary, digital technology can be used.

However, appearance care had no statistically significant effect on body image, both immediate and short-term effects. Body image is conceptualized as a multifaceted construct, defined as the mental representation of one’s body, and feelings about physical appearance and attractiveness, as well as perceived state of overall health and sexuality. Perhaps brief interventions in appearance care may fail to target specific body image–related constructs [30]. Besides, appearance care might confront patients to face changes in appearance in advance, with negative effects on the patient, diminishing the immediate effect of the intervention. The spontaneous
adaptation to appearance changes might have attenuated the short-term effects of the intervention on body image. It was also possible that body image issues were not a primary concern for some patients, as patients might be more concerned with survival or the next steps of treatment. Perhaps the timing of the intervention played an important role. Coupled with the large heterogeneity of the studies, the results of the meta-analysis need further verification. However, a meta-analysis by Sebri et al. [29] suggested that psychological interventions are effective in reducing body image issues. Perhaps, the introduction of targeted psychological interventions in appearance care is promising.

Similarly, appearance care had no statistically significant effect on quality of life, both immediate and short-term effects. One possible explanation might be related to that quality of life is not the main objective of interest. Both two studies [14, 17] were pre- and post-test studies. Di Mattei (2017) [17] had participants still undergoing chemotherapy.

Fig. 2 Forest plot: the immediate and short-term effect of appearance care on body image

Fig. 3 Forest plot: the immediate and short-term effect of appearance care on self-esteem
and Ikeda (2020) [14] had participants who will be having, who are having, or who have completed chemotherapy. Chemotherapy can negatively affect the quality of life of breast cancer patients, and patients who have received chemotherapy generally have a poor quality of life [31]. Combined with experiencing a range of cosmetic changes such as hair loss, skin pigmentation, and weight changes, these negative effects on quality of life may undermine the positive effects of appearance care.

Regarding the facilitators, all the studies were led by beauty experts, ignoring the important role of nurses. Qualitative studies [32] have found that the majority of patients categorize appearance care as care services related to their physical and mental state and medical complementary.
Almost all patients expected hospital-provided appearance care and hoped that care will continue. Perhaps, in the future, an oncology nurse-led cosmetic care plan could be considered, which may be more beneficial for patients.

**Limitations and implications**

We acknowledge several limitations of this review. First, appearance care for breast cancer patients is still in its infancy. The dose and frequency of interventions are less frequent, and the number of available studies is very small. Second, the heterogeneity is very large, such as methodological heterogeneity (including non-randomized controlled trials) and non-uniform measurement tools. Finally, assessments of the long-term effects of appearance interventions are limited due to a general lack of methodological rigor.

Despite these limitations, future work may benefit from this review. It is worthwhile to develop digitally assisted RCTs with a large sample, and it is necessary to monitor compliance with appearance management online and explore long-term effects. We should also focus on qualitative data on patients’ subjective experiences to explore personalized interventions and make improvements.

**Conclusion**

Appearance care may be a promising intervention to improve anxiety, depression, self-esteem, and sexual dysfunction in breast cancer patients. However, improvements in body image and quality of life have not been found. More high-quality RCTs are needed to validate these findings. Online appearance care programs and exploration of long-term effects should also be considered.

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**Author contribution** The idea for the review was from MYZ. The literature search and data analysis were performed by MYZ, SHS, and YHZ. The methodology was guided by YHZ, LLC, HYH, JJC, NZ, and MFZ. The first draft of the manuscript was written by MYZ and SHS, and all authors commented and revised the original versions of the manuscripts. All authors read and approved the final manuscripts. The whole process of the review was supervised by MFZ.

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**Code availability** Not applicable.

**Declarations**

**Ethical approval** Not applicable.

**Consent to participate** Not applicable.

**Consent for publication** Not applicable.

**Conflict of interest** The authors declare no competing interests.

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