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REVIEW

The psychosocial impact of contralateral risk reducing mastectomy (CRRM) on women: A rapid review

Karen Collins[1] | Melanie Gee[1] | Anna Clack[1] | Lynda Wyld[2]

[1] Centre for Health and Social Care Research, Faculty of Health and Wellbeing, Sheffield Hallam University, Sheffield, UK

[2] Academic Unit of Surgical Oncology, Department of Oncology and Metabolism, University of Sheffield Medical School, Sheffield, UK

Correspondence
Professor Karen Collins, Centre for Health and Social Care Research, Faculty of Health and Wellbeing, 32 Collegiate Crescent, Sheffield Hallam University, Sheffield S10 2BP, UK.
Email: k.collins@shu.ac.uk

Abstract

Objectives: For women who have been diagnosed with unilateral breast cancer, there is an increasing trend for them to request removal of the contralateral healthy breast, the so-called contralateral risk reducing mastectomy (CRRM). The current literature is only just beginning to identify patient-reported reasons for undergoing CRRM and associated patient-reported outcomes. It is also unclear whether women at moderate/high risk of developing a subsequent primary contralateral breast cancer report similar outcomes to those considered to be at low/average risk. This lack of knowledge provides the rationale for this review.

Methods: A rapid review methodology was undertaken to identify and explore the published research literature focused on the longer term (>5 y) psychosocial impacts on women who undergo CRRM.

Results: Fifteen studies were identified. No UK studies were identified. High satisfaction and psychosocial well-being were consistently reported across all studies. Reducing the risk of a subsequent contralateral breast cancer and therefore reducing cancer-related anxiety, and satisfaction with cosmesis, were key themes running across all studies explaining satisfaction. Dissatisfaction was associated with adverse effects such as poor cosmesis, body image changes, femininity, sexual relationships, reoperations for acute and longer term complications, and reconstructive problems.

Conclusions: Satisfaction and psychological well-being following CRRM was consistently high across all studies. However, the findings suggest women need to be more fully informed of the risks and benefits of CRRM and/or immediate/delayed reconstruction to support informed decision making.

KEYWORDS

breast, cancer, contralateral, oncology, psychosocial, rapid review

1 | BACKGROUND

Breast cancer is the most common cancer in women in the UK, with over 53 000 new cases being diagnosed in the UK each year.[1] Although there is an overwhelming evidence of the efficacy of breast conservation surgery in achieving excellent local disease control, there has been a controversial recent trend towards bilateral mastectomy, not for oncological benefit, but for future risk reduction. Over the past decade, the total number of women in England who had a bilateral mastectomy doubled.[2] For women without cancer, but at high risk of subsequent primary cancer development (such as BRCA gene carriers), there is a well-established benefit in terms of both reducing the risk of cancer by 90+% and improving survival.[3] However, for women who have been diagnosed with a unilateral breast cancer, there is a trend for them to request removal of the contralateral healthy breast, the so-called contralateral risk reducing mastectomy (CRRM). Although indicated in a minority of patients for whom the risk of contralateral breast cancer (CBC) is high (family history, genetic mutation carriage),[4-6] there are no significant survival benefits of undergoing CRRM among average risk women (0.1%-0.6% per year).[2,4,7-9]

In the United States, a consensus statement about CRRM and guidelines for how it should be managed have recently been published by the American Association of Breast Surgeons that state that for

most average risk women with unilateral breast cancer, CRRM should be discouraged as it has no oncological benefit.[6]

Within Europe, neither the European Society of Breast Cancer Specialists nor EUROPA DONNA (the European Breast Cancer Coalition) have published guidelines on CRRM. The 14th St. Gallen International Breast Cancer Consensus Conference[10] in 2015 also made little mention of this. The European Society for Medical Oncology breast cancer guidelines[11] acknowledge that this is an increasingly prevalent option and advise that women considering CRRM must be carefully counselled. Within the UK specifically, the National Institution for Health and Care Excellence has yet to publish any recommendations about CRRM; however, guidelines are due for review during 2017.

Although there are a plethora of studies that have focused on womens' experiences and outcomes of bilateral risk reducing mastectomy,[12,13] to date, research focused on CRRM has tended to focus on the oncologic outcomes (risk of CBC, risk reduction with CRRM, and lack of survival benefit) and on factors impacting on patients' decisions to pursue CRRM.[4,14] The current literature is only just beginning to identify patient-reported reasons for CRRM.[4] Several recent studies that have reported satisfaction following CRRM[4,20]; however, these have been based on groups of women at high risk of developing a CBC. It is unclear whether low- to average-risk women report similar patient-reported outcomes. This lack of knowledge provides the rationale for this review.

2 | AIM

The aim of this rapid review was to identify and explore the published research literature focused on patient-reported psychosocial impacts of CRRM on women at low/average/high risk of developing a future CBC. Specifically, the review aimed to answer the following research question:

What psychosocial impact does a CRRM have on women low/average/high risk of developing a future CBC?

3 | METHODS

3.1 | Rapid review methodology

A rapid review methodology was undertaken to enable identification and synthesis of published research evidence in a timely and resource-efficient manner.[15-17] This rapid review differs from a full systematic review in 3 ways. Firstly, searches were restricted to bibliographic databases: grey literature (ie, unpublished papers, reports, and conference abstracts not indexed by the bibliographic databases) was not searched. Secondly, during the study selection stage, not all papers were double-screened. Thirdly, in relation to data extraction and synthesis, only key variables of relevance to the review question were extracted. No meta-analysis was planned. No ethical approvals were required for this study.

3.2 | Searches

Electronic searches were conducted in the Cochrane Library (Wiley), Medline (EBSCOHost), CINAHL (EBSCOHost), PsycINFO (ProQuest), Scopus (Elsevier), and Web of Science (Thomson Reuters), on February 19, 2016. The search strategy included search terms in the title/abstract and relevant database subject headings relating to CRRM, combined with search terms and subject headings relating to psychosocial outcomes of interest (including quality of life, satisfaction, body image, sexuality, self-esteem, and relationships). See Table 1 for an indicative search strategy in Medline. No language or date restrictions were applied to the searches, although non-English language results were excluded at the screening stage. Reference checking and citation searching were performed in respect of relevant papers, to identify additional relevant papers not returned by the searches. Duplicates were removed prior to study selection, and the references were managed in a RefWorks database.[18]

3.3 | Study selection

Original empirical studies of women (>18 y) with breast cancer who had undergone CRRM, and which reported on psychosocial outcomes of interest (including quality of life, satisfaction, body image, sexuality, self-esteem, and relationships), were included. Studies of men, women without breast cancer, women undergoing unilateral mastectomy or bilateral risk reducing mastectomy only (or where data relating to CRRM patients could not be distinguished), or studies focusing only on physical outcomes were excluded. Books, editorials, and letters were excluded.

A screening tool incorporating the above inclusion/exclusion criteria was developed and piloted on the same 20 papers, by 3 reviewers (A.C., K.C., and M.G.). Following this, the lead reviewer (A.C.) undertook the remainder of the title and abstract screening and all the full-text screening. Two other reviewers (K.C. and M.G.) each spot-checked 10 random papers for full-text inclusion/exclusion and confirmed agreement. Where there was any doubt regarding study inclusion, a consensus was taken.

3.4 | Data extraction and synthesis

A data extraction sheet was developed and piloted using the same 4 included studies, by 2 reviewers (A.C. and M.G.), to ensure consistency. Data from each of the remaining studies was extracted by one of these reviewers and checked by the other. Extracted fields included country, study design, study methodology, sample size, outcomes of interest, measurement instruments (if applicable), and key findings related to the outcomes of interest. The findings were synthesised thematically, in tabular and narrative format, classified according to the outcomes of interest.

4 | RESULTS

See Figure 1 for a flow chart summarising the search and screening processes. The database searches identified 361 records, resulting in 206 records after the removal of duplicates and non-English publications. Following title/abstract screening, 70 full papers were examined, from which 15 were included in this review. Reference and citation searches (including checking the reference lists of any literature reviews returned in the original searches) yielded no further relevant

TABLE 1 Indicative search strategy in Medline

S1	TI "Contralateral Risk Reducing Mastectom*" or AB "Contralateral Risk Reducing Mastectom*" or TI "Contralateral Surger*" or AB "Contralateral Surger*"	230
S2	TI "contralateral risk reduc* mastectom*" or AB "contralateral risk redu* mastectom*"	17
S3	S1 or S2	247
S4	(MH "quality of life")	131 267
S5	TI "quality of life" or AB "quality of life"	178 080
S6	TI "patient-reported outcome measures" or AB "patient-reported outcome measures"	1013
S7	TI "patient-reported experience measures" or AB "patient-reported experience measures"	14
S8	TI psychological or AB psychological	148 789
S9	TI psychosocial or AB psychosocial	67 719
S10	(MH "patient satisfaction+")	67 044
S11	TI satisfaction or AB satisfaction	90 107
S12	TI wellbeing or AB wellbeing	7516
S13	(MH "body image")	13 976
S14	TI "body image" or AB "body image"	7428
S15	(MH "emotions+")	184 009
S16	TI regret* or AB regret*	2917
S17	TI relationship* or AB relationship*	971 697
S18	TI partner* or AB partner*	119 789
S19	TI "sexual function*" or AB "sexual function*" or TI sexuality or AB sexuality	20 342
S20	(MH "mental disorders+")	1 012 537
S21	TI mental* or AB mental*	255 405
S22	TI depress* or AB depress*	349 415
S23	TI anxiet* or AB anxiet*	130 565
S24	TI stress or AB stress	512 998
S25	TI self-esteem or AB self-esteem	15 311
S26	TI (behaviour* or behavior*) or AB (behaviour* or behavior*)	886 130
S27	TI emotion* or AB emotion*	133 613
S28	S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30	3 728 026
S29	S3 and S28	66

Abbreviations: AB, abstract words; MH, database subject heading; TI, title words.

records. Thus, in total, 15 records,[19-33] relating to 13 studies, are included in this review.

The main characteristics of the included studies are shown in Table 2.

Three of the papers[20,22,33] relate to the same population followed up at 2 different time points (first time point was at median FU of mean 10.7 y; range, 1.9-34.4 y) and second follow-up was at a mean 20.2 years (range, 11.4-44.5 y) post-CRRM. Two papers[20,23] report on both surveys, but one of these[23] reports only in respect of those women who responded to both surveys and has a focus on reconstruction and reoperation on long-term satisfaction. The third[22] paper reports on the first survey only. As these 3 papers report on different data, they have been treated as separate (but related) entities in the presentation of the results.

The studies identified were undertaken in the United States,[19,20,22-25,28-32] Canada,[21] Hong Kong,[27] and Sweden.[26,33] No UK studies were identified. Findings have been grouped into the following headings: satisfaction with the decision to undergo CRRM, overall satisfaction with CRRM, impact on psychological health, and perceived impact on partners. The key findings from the papers in relation to each of these outcomes are presented below.

4.1 | Satisfaction with the CRRM procedure

Five papers [20,22-24,27]were identified. None of the papers focused on low- or average-risk women so it is not possible to subgroup analyse according to risk level. Satisfaction was typically measured using Likert scales, with one study[22] supplementing this with open-ended questions.

Within these studies, womens' satisfaction with the procedure (either "satisfied" or "very satisfied") ranged from 67% from a survey[27] of 12 women (follow-up at mean 20 mo after CRRM) to 90% from a survey[23] of 269 women (mean 20.2 y post-CRRM).

In the cohort study[22] of 583 women who had undergone CRRM (mean 10.3 y post-CRRM), 83% (n = 471) of women reported that they were satisfied with their CRRM, similarly 83% (n = 471) stated that they would choose to have a CRRM again. Having "peace of mind" knowing the risk of breast cancer in the unaffected breast (contralateral breast) was reduced and satisfaction with cosmesis were the main reasons explaining satisfaction. Only 9% (n = 52) of women stated they were dissatisfied with their CRRM. Dissatisfaction with cosmetic results, adverse symptoms, complications, or diminished body image were reasons given for this.[22] Strong associations were made between

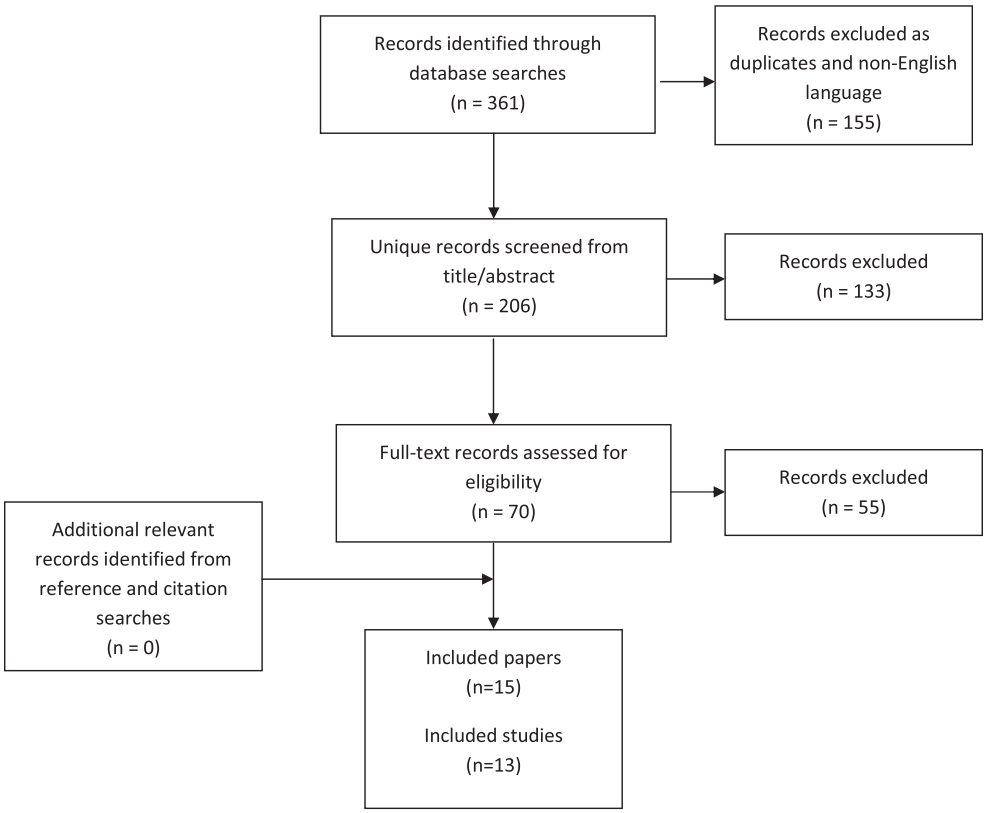

FIGURE 1 Document flow diagram

dissatisfaction with CRRM and decreased satisfaction with body appearance and increased levels of stress in life after CRRM.[22]

A second survey[23] was undertaken with the same cohort of women 10 years later (mean 20.2 y post-CRRM). Of the 269 women (mean 20.2 y post-CRRM), 90% (n = 243) stated they were satisfied with their CRRM. Perception of making an informed choice and current quality of life was moderately associated with higher satisfaction with CRRM (r = 0.37 and 0.37, respectively).[23]

Dissatisfaction with CRRM was significantly associated with the need for reoperation due to complications with the reconstruction.[20,22] Similarly, in a smaller study[27] that sampled just 12 women, 6 of whom had reconstructive surgery, and only 1 woman who experienced flap failure stated her overall satisfaction with the CRRM was unsatisfactory.[27]

4.2 | Satisfaction with decision

Five papers, [20,22,23,26,27] relating to 3 studies, investigated womens' satisfaction with their decision to undergo CRRM, and whether or not they would choose CRRM again. None of the studies focused on low- or average-risk women. A combination of Likert scales, study-specific measurement tools, and open-ended questions were used within the reported studies.

Most women reported that they were satisfied with their decision and would choose CRRM again, with responses ranging from 75% from a survey[27] of 12 women (follow-up at mean 20 mo after CRRM) to 100% in a survey[26] of 21 women (follow-up at median 42 mo). In 2 large surveys[22,23] of 269 women, 90% and 92% of women at a median of 10.3 and 20.2 years post-CRRM, respectively, reported that knowing what they do now, they probably or definitely would choose CRRM again.

4.3 | Impact of CRRM on body image

Nine papers[19-24,27-29] relating to 7 studies explored the impact of CRRM (with and without reconstruction) on womens' body image using a range of validated and nonvalidated tools in the short-, medium-, or long-term. None of the studies focused on low- or average-risk women. Among the quantitative studies, perceptions of body image were typically measured using ordinal scales or Likert scales. One study[23] used a validated Body Image Scale.

Womens' overall perceptions of their body image and general satisfaction with their appearance were measured by 2 studies.[20,22,23,27] More specifically, studies explored women's feelings of femininity,[20,22] sexuality and sexual attractiveness,[23,28,29] self-consciousness about their appearance,[23,24] and satisfaction with the cosmetic result of CRRM/reconstruction.[29]

Body image and cosmesis post-CRRM emerged as an important theme within these studies.[19,21] Women expressed positive views of enhanced breast size or pertness, pride in survivorship, acceptance of the trade-off of survival at the expense of suboptimal cosmesis, and regret at the loss of femininity.[19]

Two papers relating to the same large study reported long-term follow-up of women with a personal and family history of breast cancer (FU median[22] 10.3 y [n = 583] and median[23] 20.2 y [269 women]

TABLE 2 Main characteristics and outcomes of the papers reviewed

Study, Country, Design	Study Aim(s) (Relevant to this Review)	Sample Size, Study Population, Time of Follow-Up (if Given) (Relevant to this Review)	Outcome Categories of Findings Relevant to this Review
Altschuler et al[19] United States Qualitative/quantitative (Qualitative element relevant to this review) Survey	Assessment of the multidimensional and psychosocial effect of bilateral and CRRM among women with/without personal history of breast cancer	n = 327 women (of whom n = 249 had CRRM and n = 78 had bilateral prophylactic mastectomy) CRRM between 1979 and 1999, aged 18-80 y Follow-up post-CRRM: 3-22 y (median, 9 y)	Satisfaction with decision, body image relationships, mental health
Boughey[a] et al[20] United States Quantitative Two surveys	Long-term satisfaction with CRRM and comparison between those with/without breast reconstruction	First survey: n = 583 women (of whom n = 403 underwent reconstruction) Second survey: n = 269 women (of whom n = 210 underwent reconstruction) Women with unilateral breast cancer plus family history of breast cancer who underwent CRRM. Age at first survey 28-92 y Follow-up post-CRRM, first survey: 1.9-35.4 y (mean, 11.9 y)[b] Follow-up post-CRRM, second survey: 11.4-44.5 y (mean, 20.2 y)	Satisfaction with procedure, decision, body image, relationships, mental health
Frost[a] et al[22] United States Quantitative Survey	Investigation of satisfaction/dissatisfaction with CRRM and factors associated	n = 583 women Women with unilateral breast cancer and a family history of breast cancer who underwent CRRM. Age at first survey 28-92 y Follow-up post-CRRM: Mean 10.3 y[b]	Satisfaction with procedure, decision, body image, relationships, mental health
Frost[a] et al[23] United States Quantitative Survey	Evaluation of long-term consistency of satisfaction with CRRM and adverse psychological and social effects	n = 269 women (who responded to first and second surveys) Women with unilateral breast cancer and family history of breast cancer who underwent CRRM. Age at first survey 31.7-84.3 y; second survey 41.8-94.0 y. Follow-up post-CRRM, first survey: 1.9-35.4 y (mean, 10.7 y) Follow-up post-CRRM, second survey: 11.4-44.5 y (mean, 20.2 y)	Satisfaction with procedure, decision, body image, relationships, mental health
Covelli et al[21] Canada Qualitative Interviews	Decision making for early stage breast cancer and choice for mastectomy	n = 14 women (who had unilateral mastectomy + CRRM) Women who had undergone either UM or UM + CRRM within the previous 9-12 mo. Of the UM + CRRM patients, age range 37-69 y, median 46 y Follow-up post-CRRM: 9-12 mo	Body image, relationships
Geiger et al[24] United States Quantitative Survey	Psychosocial outcomes following CRRM	n = 519 women (who had CRRM) Women diagnosed with breast cancer between 1979 and 1999, aged 18-80 at diagnosis. Follow-up post-CRRM: Not reported	Satisfaction with procedure, body image, relationships, mental health, contentment, QoL
Graves et al[25] United States Quantitative Interview	To determine the predictors and impact of CRRM on psychological outcomes	n = 89 women (who had CRRM by the 12-mo follow-up, from n = 435 women affected with unilateral breast cancer Participants (N = 435) were women affected with unilateral breast cancer who	Mental health

(*Continues*)

TABLE 2 (Continued)

Study, Country, Design	Study Aim(s) (Relevant to this Review)	Sample Size, Study Population, Time of Follow-Up (if Given) (Relevant to this Review)	Outcome Categories of Findings Relevant to this Review
		received BRCA1/2 test from 1995 to 2000. Follow-up post-CRRM: <12 mo	
Isern et al[26] Sweden Quantitative Survey	Long-term aesthetic outcome, patient satisfaction, health-related quality of life, complication rates among CRRM women (and immediate reconstruction)	n = 21 women (who underwent CRRM) Women who underwent CRRM with immediate breast reconstruction Follow-up post-CRRM: 7-99 mo (median, 42 mo)	Satisfaction with decision
Kwong & Chu[27] Hong Kong Qualitative/quant interviews Interview	Impact of CRRM of high-risk unilateral breast cancer women following a genetic BRCA1/ BRCA2 diagnosis	n = 12 women Age 34-55 y Follow-up 11-34 mo (mean, 21 mo)	Satisfaction with procedure, decision, body image, and relationships
Lee et al[28] United States Quantitative Survey	QoL impairment patients with breast cancer (diagnosed prior to 50 y)	n = 143 women of whom n = 67 women had undergone CRRM (n = 54 underwent immediate CRRM, n = 13 underwent delayed CRRM) Women diagnosed 18-49 y with non metastatic breast cancer and ≥6 mo from last curative treatment (surgery, chemotherapy, radiation) except for ongoing hormone therapy Follow-up post-CRRM: ≥6 mo (mean not reported)	Body image
Montgomery et al[29] United States Qualitative Semistructured interview	To understand which factors may cause a women to regret decision to undertake CRRM	n = 18 women who expressed regret from an overall survey response of n = 296 women Women who regretted CRRM mean age 53.8 y (range, 27-80; median, 53). Follow-up post-CRRM: 0.25-43.8 y (mean, 10.9 y)	Satisfaction with decision Body image
Nekhlyudov et al[30] United States Quantitative Survey	To determine women's reported decision-making roles regarding CRRM and to explore the association of decision-making roles with psychological outcomes	n = 431 women Women aged 18-80 y with CRRM between 1979 and 1999. Follow-up post-CRRM: Mean 10.0 y	Satisfaction with decision Mental health
Portschy et al[31] United States Quantitative Survey	To evaluate contralateral breast cancer risk perception among breast cancer patients	n = 43 women of whom n = 11 women had undergone CRRM Women >18 y with ductal carcinoma in situ or invasive breast cancer (newly diagnosed unilateral breast cancer). Mean age CRRM 47 y Follow-up post-CRRM: 1.8-3.5 y (mean, 2.6 y) (reporting on n = 43 women)	Satisfaction with decision Relationships Mental health
Tercyak et al[32] United States Quantitative Interview	Impact of CRRM 1 mo post-BRCA1/2 testing and after the completion of adjuvant treatment (12 mo after testing)	n = 29 and n = 44 women who had undergone CRRM at 1- and 12-mo respectively, from n = 147 and n = 149 women completing the 1- and 12-mo follow-up Mean age, 45 y (range, 23-70 y). Follow-up post-BRCA 1/2 testing: 1 and 12 mo	Mental health

(*Continues*)

TABLE 2 (Continued)

Study, Country, Design	Study Aim(s) (Relevant to this Review)	Sample Size, Study Population, Time of Follow-Up (if Given) (Relevant to this Review)	Outcome Categories of Findings Relevant to this Review
Unukovych et al[33] Sweden Quantitative Questionnaire	Prospectively (6 mo prior CRRM and 2 y following CRRM) evaluate HRQoL, anxiety and depression, sexuality, and body image among breast cancer CRRM women with a family history with immediate reconstruction	n = 60 women responding to any of the 3 questionnaires, with n = 45 women responding to the pre-CRRM survey, n = 49 at the 6-mo survey, and n = 45 at the 24-mo survey Women with a family history of breast cancer who underwent CRRM with immediate breast construction, age 25-65 y	Body image Relationships Mental health

Abbreviations: CRRM, contralateral risk reducing mastectomy; HRQoL, health related quality of life; QoL, quality of life; UM, unilateral mastectomy.

[a]The papers Boughey et al,[20] Frost et al,[22] and Frost et al[23] relate to the same large cohort study.

[b]The papers Boughey et al[20] and Frost et al,[22] although referring to the same population for the first survey, report different mean times of follow-up since CRRM.

post-CRRM). At first and second follow-up, body image was negatively affected in 33% (n = 192) and 31% (n = 89) of women, respectively. At a median FU of 10.3 years post-CRRM,[22] 33% (n = 192) of women reported decreased satisfaction with their body appearance, and 26% (n = 70) reported adverse effects of CRRM on their sense of femininity. At a median FU of 20.3 years post-CRRM,[23] 11% (n = 29) of women reported that they felt less physically attractive, and 15% (n = 41) reported feeling less sexually attractive since undergoing their CRRM. Feelings of femininity were found to correlate with sexual relationships in this study.[22] In another study, immediate CRRM was found to have a significant negative impact on sexuality compared to delayed or no CRRM.[28] A diminished sense of sexuality was reported as a reason for decision regret.[29] Self-consciousness about their appearance was reported by between 10% and 21% of women in another study.[24] In a further study,[27] 90% (n = 11) of women reported their initial impression of their appearance after surgery as being acceptable. Successful reconstruction was significantly associated with increased satisfaction with physical appearance and with increased feelings of femininity.[20]

Body image was an important factor influencing whether or not women would choose CRRM/reconstruction again.[20] Of 583 women that were surveyed 10 years post-CRRM, 69% (n = 403) underwent CRRM/reconstruction, 84% (n = 338) stated that they would choose CRRM again, and 73% (n = 296) would make the same choice regarding reconstruction. Most commonly, women cited positive effects on body image and self-esteem.[20] However, 17% (n = 68) stated that they would not choose reconstruction again, with adverse body image/poor cosmetic outcomes as being the main factors underlying this.[20]

Women in the no reconstruction group who said they would still opt for no reconstruction gave the most frequently cited reason that they felt comfortable with their body without reconstruction (42%; n = 170).

At 20 years post-CRRM, a smaller percentage of women compared to 10 years said they would change their decision: 10%, (n = 26) of reconstruction patients, and 16%, (n = 40) of no reconstruction patients, said they would change their decision. Successful reconstruction and use of implants also contributed to better adjustment towards surgical outcomes.[20]

4.4 | Impact on psychological health

Ten papers relating to 8 studies specifically examined the impact of CRRM on mental health.[19,20,22-25,30-33] None of the papers reported on differences between low-, average-, or high-risk women. Psychological health was measured in the short-, medium-, and long-term. A combination of Likert and unspecified ordinal scales were used. A number of validated instruments were also used to measure symptoms related to mental health conditions including the Hospital Anxiety and Depression scale,[33] the 15-item Impact of Events Scale,[25,32] the 17-item Multidimensional Impact Cancer Risk assessment,[32] the Functional Assessment of Cancer Therapy (FACT)-Breast Cancer Quality of Life Instrument,[24] the Centre for Epidemiologic Studies-Depressions (CES-D) scale,[24,30] and the short form of the Hopkins Symptom Checklist (HSCL-25).[25]

In one survey[20] of 583 women (at median FU of 11.9 y post-CRRM), CRRM followed by reconstruction was significantly associated with positive feelings of self-esteem (32% [n = 125] with and 12% [n = 21] without reconstruction; P = .00002). Whilst in a survey follow-up of 269 women (median of 20.2 y post-CRRM), this was 26% (n = 52) and 16% (n = 9), respectively. Differences between reconstruction and nonreconstruction patients were not statistically significant.[20]

The same large study examined emotional stability following CRRM. Emotional stability was reported to be adversely affected in 23% (n = 65) of women in the first survey (median 10.7 y post-CRRM).[23] Whilst in the second survey (mean 20.2 y post-CRRM), only 14% (n = 19) reported an adverse emotional effect.[23] In both the first and the second survey, there was no statistically significant difference in emotional stability between those who underwent reconstruction following CRRM compared to those with no reconstruction.[20]

One study[22] reported perceived stress following CRRM with 17% (n = 100) of women reporting that they experienced stress in life following CRRM. Stress was negatively correlated with self-esteem (r = 0.33) and emotional stability (r = 0.21).

Three studies reported on anxiety following CRRM.[19,31,33] In surveys[33] of 60 women at different time points, prior to CRRM, 30% (n = 18) of patients scored above the cutoff point for clinically relevant levels of anxiety (>8) on the anxiety subscale and at 6 months and

2 years post-CRRM, 37% (n = 22) and 22% (n = 13), respectively. In another study,[19] 4% (n = 25) of women post-CRRM commented on feelings of relief from breast cancer worry or anxiety since having the surgery (median follow-up 9 y; range, 3-22). A further study[31] reported no significant difference in levels of anxiety in women who chose CRRM compared to those having breast-conserving surgery or unilateral mastectomy only.

Four studies focused on depression following CRRM.[24,30,31,33] In one study, albeit with very small numbers precluding statistical analysis, rates of depression varied very little before and after CRRM.[33] They found 13% (n = 8) of patients at baseline, 12% (n = 7) at 6 months, and 8% (n = 5) at 2 years post-CRRM had evidence of clinical depression. In another study[24] of 519 women who had undergone CRRM between 1979 and 1999, 27% (n = 14) of women studied had met the Centre for Epidemiologic Studies-Depression (CES-D) threshold for depression. In another study,[30] 25% (n = 114) of women who had undergone CRRM in the past had depressive symptoms at the time of the survey (the mean time since CRRM was not reported, but 60% women had CRRM within the last 10 y).

Two studies[25,32] found that CRRM was not associated with, or a predictor of, cancer-specific distress.

One study[24] focused on contentment with life following CRRM and found that of the 580, women who had CRRM between 1979 and 1999, 76.3% (n = 396) reported significant contentment with their life post-CRRM, and only 7.3% (n = 38) reported poor levels of contentment. There were no differences between those having CRRM and those having CRRM/reconstruction.[24] This rather historic time period largely predated clinical gene testing so few women will have had risk assessment and counselling according to modern standards.

Another study[33] used the Short Form 36 Health Survey (SF-36, validated Swedish version) to report on health status following CRRM and found no statistically significant differences between preoperative and postoperative (both at 6 mo and 2 y) assessments for any of the SF-36 subscales. At 6 months post-CRRM, patients scored lower on emotional domains when compared to preoperative values. This was considered clinically significant, although this may have reflected the emotional impact of the end of the cancer treatment spell, which is often associated with depression, rather than the CRRM itself, although this was not specified.[33] However, 2 years after CRRM, a positive clinical difference (an increase in SF-36 score of >5) in social functioning and mental health was found.[33] It should be noted that the SF36 is a generic health status instrument, and more sensitive tools are available to specifically measure breast cancer and breast surgery–related outcomes.

4.5 | Impact of CRRM on relationships with partners

Nine papers[19-24,27,31,33] relating to 7 studies explored the impact of CRRM on personal relationships in the short-, medium-, and long-term using a variety of validated and nonvalidated tools. One study[33] used a specific sexual activity questionnaire (SAQ–Swedish version). Three studies[20,22-24,27] reported specifically on the extent to which sexual relationships had been affected post-CRRM. In 2 studies,[22,23] 24% (n = 143) and 23% (n = 138), respectively, stated that sexual relationships had been adversely affected 10 and 20 years post-CRRM. Changes in satisfaction with body appearance were correlated with changes in sexual relationships (r = 0.46), feelings of femininity correlating with sexual relationships (r = 0.33), and levels of stress significantly correlated with sexual relationship(s) (r = −0.23).[23] In the same study, significantly, more women who had undergone reconstruction reported adverse effects on sexual relationships at the first follow-up than those who had not (24% and 21%, respectively; P = .03); however, at the second follow-up time point, the difference was not statistically significant (23% and 18%, respectively).[20] One study found that of those who had undergone CRRM, 41% (n = 213) reported satisfaction with their sex life.[24] In another study[33]exploring sexual activity using a self-assessment questionnaire of 60 women 2 years post-CRRM, over half of the women reported problems/dissatisfaction with their body appearance, scars, femininity, and attractiveness across 2 of the body image domains.[33] One study reported on perceived strained personal relationships prior to and following CRRM and found no statistically significant differences between preoperative and postoperative scores.[31]

Three studies[19,21,27] reported that women were sensitive to the reaction of their partners following CRRM. Two of these studies[19,27] reported that spouses' attitudes and support contributed to the overall adjustment of women. They also reported that among those who were married but sexually inactive (50%, n = 3/6), lack of sexual activity predated the CRRM and simply persisted afterwards. Reasons included decreased libido after cancer treatment, menopause, and fatigue. They also found that the sexually inactive single participants appeared to adjust better to the cosmetic results of the surgery.[21]

4.6 | Conclusions and recommendations made within the reviewed studies

Conclusions from each of the reviewed studies have been grouped into 5 broad categories:

1. Additional decision support and education aids are needed not only relating to whether to have CRRM but also to what type of reconstructive surgery (if any) to select (6/15 studies).
2. Women should be informed of the potential risks and adverse outcomes (specific consideration given for sexuality, psychosocial outcomes, and body image changes) (9/15 studies).
3. The role of the health professional (surgeon, specialist nurse, and psychologist) was emphasised in supporting informed decision making, and guidance may be helpful to optimise informed decision making (4/15 studies).
4. Psychosocial and counselling support should be provided both before and after such surgery (5/15 studies).

5 | DISCUSSION

This review has synthesised the current evidence from 15 studies focused on the psychosocial impact of CRRM. Satisfaction and psychological well-being following CRRM was consistently high across all studies. Two studies reporting on the same cohort of women (mean 10.3 and 20.2 y post-CRRM) also finding that satisfaction was

consistently stable over a 10-year period.[22,23] Reducing the risk of a CBC in the future and therefore reducing cancer-related anxiety, and satisfaction with cosmesis, were key themes running across all studies explaining satisfaction.

Dissatisfaction was associated with adverse effects, with poor cosmesis, body image changes, femininity, sexual relationships, reoperations for acute and longer term complications, and reconstructive problems cited as significant concerns.[19-24,29]

The relative benefit of having CRRM is greater among BRCA carriers than for non-BRCA carriers who are considered to be at low risk of developing a subsequent CBC. Therefore, women may arguably be psychologically different in terms of levels of cancer anxiety and motivation according to their BRCA carrier status, and this may impact on the psychological mindset of women considering CRRM and subsequent psychological outcomes such as levels of anxiety and/or levels of decision regret. Of the 15 papers included in the review, 13 focused exclusively on women who were considered to be at high risk (family history, genetic mutation carriers) of developing a subsequent CBC. Only 3 of the studies[19,29,30] included women that were at low to average risk of developing a subsequent breast cancer, and none of the studies reported any differences between these groups.

Since undertaking this review, a systematic review focusing on factors and predictors influencing choice and satisfaction with CRRM has been published. This review primarily focuses on factors influencing decisions to undergo CRRM and rather than longer term outcomes. The review reported that overall, women appeared satisfied with their decision to undergo CRRM, and similar to our findings, adverse/diminished body image, poor cosmetic result, complications, diminished sense of sexuality, emotional issues, and perceived lack of education regarding alternative surveillance/CRRM efficacy were cited as reasons for dissatisfaction.[4]

Although not part of this review, the role and influence of health professionals and partners on treatment decisions became apparent, and further investigation is warranted.

5.1 | Clinical implications

Although satisfaction rates were high, the reasons for dissatisfaction seem to suggest that there is a need for additional information resources to support informed decision making regarding the decision to have CRRM and/or immediate/delayed reconstruction (or not), and the provision of evidence-based information on the risks and benefits of CRRM may be warranted. Women need to be more fully informed of the impact of CRRM on long-term survival, recurrence risk, postoperative complications, and possible quality of life and psychological outcomes.

5.2 | Limitations of this study

In common with all rapid reviews, this review has limitations compared with a full systematic review. By limiting the search to English language publications and not contacting authors for additional relevant research, relevant unpublished reports, grey literature, and papers published in other languages, some data may have been missed. By performing a light-touch quality assessment, there was a risk of over-reliance on and misinterpretation of poor research. The disadvantage of single-screening some of the papers by the lead author was mitigated against by piloting the screening tool by 3 authors, and 2 authors further checking a sample of screened papers. All data extractions were also double-checked by a different reviewer.

6 | CONCLUSION

Satisfaction and psychological well-being following CRRM were consistently high across all studies. However, the findings suggest women need to be more fully informed of the risks and benefits of CRRM and/or immediate/delayed reconstruction to support informed decision making.

ETHICS APPROVAL

Ethical committee approval not required as it was a rapid review of the literature.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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