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Decisional regret following risk-reducing mastectomy versus surveillance among Japanese women with breast cancer carrying BRCA1/2 pathogenic variants

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Abstract

Background

Women with germline *BRCA1/2* variants have a high lifetime risk of breast cancer, but the psychological impact and decisional regret associated with intensified surveillance versus risk-reducing mastectomy (RRM) remain unclear in Japan.

Methods

We conducted a cross-sectional study of 29 Japanese women with unilateral breast cancer carrying *BRCA1/2* variants between April 2020 and August 2024. All participants completed questionnaires at least one year after genetic test disclosure; 15 chose RRM and 14 opted for surveillance. Decisional regret and psychological outcomes were assessed using the Decision Regret Scale (DRS), Impact of Event Scale–Revised (IES-R), and Hospital Anxiety and Depression Scale (HADS); high regret was defined as DRS ≥ 26.

Results

The RRM group had a lower median DRS score than the surveillance group (10 vs 25). High decisional regret occurred in 1 of 15 RRM patients versus 6 of 14 surveillance patients ($p = 0.035$). Adjusted analysis showed that RRM was independently associated with lower odds of high regret (odds ratio 0.07, 95% CI 0.005–0.857). IES-R scores tended to be lower among RRM patients, whereas HADS scores were similar; DRS correlated positively with IES-R but not with HADS.

Conclusions

In a Japanese cohort of women with breast cancer carrying pathogenic *BRCA1/2* variants, lower decisional regret was observed among those who chose risk-reducing mastectomy compared with surveillance.

Introduction

Women carrying pathogenic variants in *BRCA1* or *BRCA2* have markedly elevated lifetime risks of breast and ovarian cancer. The cumulative lifetime risk of breast cancer is around 12% for women in the general population, whereas carriers of *BRCA1/2* mutations are reported to have a cumulative risk approaching 70% by age 80 (1–3).

Risk management for breast cancer in *BRCA1/2* carriers includes intensified surveillance for early detection and risk-reducing mastectomy (RRM). Surveillance involves minimal physical invasiveness;

however, repeated psychological stress associated with pre- and post-test anxiety and responses to false-positive results has been noted (4, 5). Reports indicate that anxiety and cancer-related distress decline over time in those who undergo risk-reducing surgery, whereas they increase or persist in those followed with surveillance (6–8). RRM can reduce the risk of developing breast cancer by approximately 90–95% (9, 10); however, it is an irreversible intervention, and concerns have been raised about its effects on postoperative body image and sexual function (11). On the other hand, some studies have reported no difference in quality of life between groups undergoing contralateral RRM after a breast cancer diagnosis and those who underwent breast-conserving surgery or unilateral mastectomy (12), and evidence regarding psychological impact is not entirely consistent.

In Japan, both risk-reducing mastectomy (RRM) and risk-reducing salpingo-oophorectomy (RRSO) were included in national health insurance coverage in April 2020, reflecting the importance of supporting individual values and shared decision-making in breast cancer risk management. However, data comparing the psychological impact of choosing RRM versus surveillance among individuals with a history of breast cancer carrying *BRCA1/2* pathogenic variants remain limited in Japanese populations. Therefore, this study aimed to compare decisional regret between Japanese individuals with breast cancer carrying pathogenic *BRCA1/2* variants who chose risk-reducing mastectomy and those who chose surveillance, and to explore differences in psychological outcomes between the two groups.

Materials and Methods

Study design and participants

We conducted a cross-sectional psychological assessment within a prospective institutional cohort at Hiroshima University Hospital. Eligible individuals were those with breast cancer who were identified as carrying a pathogenic variant in BRCA1 or BRCA2 between April 2020 and August 2024. Inclusion criteria were women aged 18 years or older with a history of unilateral breast cancer for whom RRM was among the treatment options and who were at least one year from the diagnosis of hereditary breast and ovarian cancer (HBOC). Exclusion criteria were death at the time of assessment, male sex, ongoing treatment for stage IV disease or distant recurrence, a history of bilateral mastectomy for bilateral breast cancer, and inability to ensure adequate follow-up. Written informed consent was obtained from all participants, and questionnaires were administered during outpatient visits. The median interval from disclosure of genetic test results to completion of the psychological questionnaires was 3.2 years (range 0.9–4.5 years). Among those who underwent RRM, the median interval from surgery to psychological assessment was 2.5 years (range 0.3–4.4 years).

Genetic counseling

All participants received genetic counseling from a clinical geneticist and certified genetic counselor both before genetic testing and at the time of result disclosure. Pre-test counseling included collection of pedigree information, general information on HBOC, surveillance for breast and ovarian cancer, options for risk-reducing surgery, and indications for PARP inhibitors. Post-test counseling covered each

patient's test result, surgical options and associated recurrence risks, options for RRM and RRSO, insurance coverage, and indications for PARP inhibitors. Information on other HBOC-related cancers, such as ovarian and pancreatic cancer, and guidance on how and when to recommend genetic testing to relatives were also provided. Genetic counseling was available at any time as requested by the patient, not limited to pre- and post-test sessions.

Psychological assessments

Decisional regret regarding the decision to undergo contralateral RRM versus continued surveillance for management of contralateral breast cancer risk in HBOC was assessed using the Decision Regret Scale (DRS). The DRS comprises five items evaluating satisfaction with and regret about the decision; item scores are converted to yield a total score of 0–100, with higher scores indicating greater regret. Based on previous studies (13, 14), a DRS score of 26 or higher was defined as high regret.

Cancer-specific psychological distress was assessed using the Impact of Event Scale–Revised (IES-R), which evaluates intrusion, avoidance, and hyperarousal symptoms. The total IES-R score ranges from 0 to 88; scores of 0–8 were defined as no symptoms, 9–25 as mild, 26–43 as moderate, and 44 or higher as severe psychological distress (15, 16).

Anxiety and depression were evaluated with the Hospital Anxiety and Depression Scale (HADS). The HADS consists of 14 items, seven each for anxiety (HADS-A) and depression (HADS-D), rated 0–3; subscale scores range from 0 to 21. Scores of 0–7 indicate no anxiety or depression, 8–10 possible anxiety or depression, and 11 or higher anxiety or depression (17, 18). All questionnaires used Japanese versions with confirmed reliability and validity.

Statistical analysis

Primary comparisons were made between the risk-reducing mastectomy (RRM) and surveillance groups. Continuous variables were presented as medians with interquartile ranges (IQRs) and compared using the Mann–Whitney U test, while categorical variables were compared using Fisher's exact test. Associations between scale scores were assessed using Spearman's rank correlation coefficient.

To explore factors associated with high decisional regret, multivariable logistic regression analysis was performed with high decisional regret as a binary outcome. Based on clinical relevance and prior literature, explanatory variables included performance of RRM, age at the time of the questionnaire, and the interval (in years) between disclosure of genetic test results and completion of the questionnaire. Given the limited sample size, the number of explanatory variables was restricted to avoid overfitting. Odds ratios (ORs) with 95% confidence intervals (CIs) and p-values were calculated.

All statistical analyses were conducted using R software (version 4.3.1). All tests were two-sided, and a p-value < 0.05 was considered statistically significant.

Results

Study population

From April 2020 to August 2024, 46 individuals with breast cancer at our institution were identified as carrying pathogenic germline *BRCA1/2* variants. Sixteen individuals were excluded because they did not meet the eligibility criteria: six had died, one had male breast cancer, one had stage IV ovarian cancer, six had undergone bilateral mastectomy for bilateral breast cancer, and two were lost to follow-up. One patient declined to participate. Thus, 29 patients were analyzed; 15 who underwent RRM constituted the RRM group, and 14 who chose surveillance formed the surveillance group (Fig. 1).

Participant characteristics

The median age at questionnaire was 52 years (IQR: 45–64): 50 years (45–64) in the RRM group and 53 years (47–58) in the surveillance group; there was no significant difference between groups. Age at initial breast cancer diagnosis was likewise comparable. Marital status, parity, family history, employment, education, household income, distribution of pathogenic variants, stage and subtype of breast cancer, and treatments (chemotherapy, endocrine therapy) did not differ significantly between groups, with similar distributions across factors (Table 1). Risk-reducing salpingo-oophorectomy was performed in 12 of 15 patients (80%) in the RRM group and in 5 of 14 patients (36%) in the surveillance group, a significantly higher frequency in the RRM group ($p = 0.025$) (Table 1).

Table 1. Characteristics of participants

Characteristic	Category	Total	RRM	Surveillance	P-value
		(n=29)	(n=15)	(n=14)	
Age at the time of questionnaire	Median (IQR)	52 (45–64)	50 (45–64)	53 (47–58)	0.68
Age at diagnosis of first breast cancer	Median (IQR)	43 (39–56)	41 (36–57)	45 (41–53)	0.73
Marital status	Married/living as married	25 (86%)	11 (73%)	14 (100%)	
	Single/never married	2 (7%)	2 (13%)	0 (0%)	
	Divorced/separated/widowed/other	2 (7%)	2 (13%)	0 (0%)	0.11
Have child(ren)	Yes	23 (79%)	11 (73%)	12 (86%)	0.65
	No	6 (21%)	4 (27%)	2 (14%)	
Higher education (4-year college and higher)	Yes	10 (34%)	4 (27%)	6 (43%)	0.45
	No	19 (66%)	11 (73%)	8 (57%)	
Employment status	Employed full time	7 (24%)	3 (20%)	4 (29%)	0.46
	Employed part time	12 (41%)	7 (47%)	5 (36%)	
	Self-employed	1 (3%)	1 (7%)	0 (0%)	
	Homemaker	7 (24%)	4 (27%)	3 (21%)	
	Other	2 (7%)	0 (0%)	2 (14%)	
Annual household income*	Less than $34,000	15 (52%)	6 (40%)	9 (64%)	0.27
	$34,000 or more	14 (48%)	9 (60%)	5 (36%)	
Mutation	*BRCA1*	13 (45%)	7 (47%)	6 (43%)	1.00

	BRCA2	16 (55%)	8 (53%)	8 (57%)	
Risk-reducing salpingo-oophorectomy	Yes	17 (59%)	12 (80%)	5 (36%)	0.03
	No	12 (41%)	3 (20%)	9 (64%)	
History of pharmacological treatment for anxiety and/or depression	Yes	3 (10%)	3 (20%)	0 (0%)	0.22
	No	26 (90%)	12 (80%)	14 (100%)	
Stage	I	12 (41%)	6 (40%)	6 (43%)	0.16
	IIA	11 (38%)	8 (53%)	3 (21%)	
	IIB	4 (14%)	1 (7%)	3 (21%)	
	IIIA	2 (7%)	0 (0%)	2 (14%)	
Subtype	ER+HER2-	15 (52%)	6 (40%)	9 (64%)	0.20
	HER2+	3 (10%)	1 (7%)	2 (14%)	
	TNBC	11 (38%)	8 (53%)	3 (21%)	
Chemotherapy	Adjuvant	13 (45%)	8 (53%)	5 (36%)	0.47
	Neoadjuvant	3 (10%)	1 (7%)	2 (14%)	
	None	8 (28%)	3 (20%)	5 (36%)	
Endocrine therapy	Yes	15 (52%)	7 (47%)	8 (57%)	0.72
	No	14 (48%)	8 (53%)	6 (43%)	
Complications of breast cancer surgery (Grade ≥ 3)	Yes	0 (0%)	0 (0%)	0 (0%)	-

Complications of Reconstruction surgery (Grade ≥ 3)	Yes	2 (7%)	2 (13%)	-

ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; RRM, risk-reducing mastectomy.

Decisional Regret Scale

DRS scores were compared between the RRM and surveillance groups. When analyzed as continuous variables, the median DRS score was 10.0 (IQR 5.0–25.0) in the RRM group and 25.0 (IQR 11.3–33.8) in the surveillance group; although the difference did not reach statistical significance, the RRM group tended to have lower scores (Mann–Whitney U test, $p = 0.055$) (Table 2A). Figure 2 presents box plots of DRS score distributions in the RRM and surveillance groups. DRS scores in the RRM group were concentrated at low values, whereas those in the surveillance group extended toward higher values (Fig. 2). When dichotomized as high regret (DRS ≥ 26), high regret was observed in 7 of 29 patients overall (24%): 1 of 15 (7%) in the RRM group and 6 of 14 (43%) in the surveillance group. Fisher's exact test (two-sided) showed that high regret was significantly less frequent in the RRM group ($p = 0.035$) (Table 2).

Table 2
Comparison of DRS, IES-R, and HADS scores

Scale	Category	Total	RRM group	Surveillance group	P-value
		(n = 29)	(n = 15)	(n = 14)	
DRS	Total score, median (IQR)	15.0 (6.0–25.0)	10.0 (5.0–25.0)	25.0 (11.3–33.8)	0.055†
	High decisional regret (≥ 26), n (%)	7 (24%)	1 (7%)	6 (43%)	0.035‡
IES-R	Total score, median (IQR)	7.0 (3.0–13.0)	4.0 (1.0–8.0)	9.0 (7.0–14.8)	0.060†
	0–8 (No distress), n (%)	18 (62%)	12 (80%)	6 (43%)	0.058‡
	9–25 (Mild distress)	8 (28%)	1 (7%)	7 (50%)	
	26–43 (Moderate distress)	2 (7%)	1 (7%)	1 (7%)	
	≥ 44 (Severe distress)	1 (3%)	1 (7%)	0 (0%)	
HADS	HADS (Anxiety)	5.0 (2.0–7.0)	4.0 (1.0–7.5)	5.5 (3.0–6.0)	0.60†
	HADS (Depression)	4.5 (2.0–8.0)	4.0 (2.0–8.0)	5.0 (3.0–7.0)	0.96†

DRS, Decision Regret Scale; IES-R, Impact of Event Scale–Revised ; HADS, Hospital Anxiety and Depression Scale.

†: Wilcoxon rank-sum test; ‡ : Fisher's exact test.

P value for IES-R categories represents comparison of overall distribution between groups.

Multivariable logistic regression with high regret (DRS ≥ 26) as the outcome included RRM performance, age, and time from BRCA testing to questionnaire as explanatory variables. RRM was independently associated with significantly lower odds of high regret compared with surveillance (odds ratio = 0.066, 95% CI 0.005–0.857, $p = 0.038$). Age and the interval from genetic testing to questionnaire were not significantly associated with high regret (Table 3).

Table 3

Multivariable analysis of factors associated with high decisional regret Multivariable logistic regression analysis identifying factors associated with high decisional regret (DRS ≥ 26). Risk-reducing mastectomy was independently associated with lower odds of high decisional regret, whereas age and time since diagnosis were not.

Variable	Odds ratio (95% CI)	P-value
RRM (yes vs. no)	0.07 (0.01–0.86)	0.038
Age (per 1-year increase)	0.92 (0.82–1.03)	0.165
Years since HBOC diagnosis (per 1-year increase)	0.67 (0.26–1.87)	0.510

Impact of Event Scale–Revised

When analyzed as a continuous variable, the median IES-R total score tended to be lower in the RRM group than in the surveillance group (4.0 [IQR, 1.0–8.0] vs 9.0 [7.0–14.8]), although the difference did not reach statistical significance ($p = 0.060$) (Table 2).

When IES-R total scores were categorized, no symptoms (0–8) were observed in 18 participants overall: 12 of 15 (80%) in the RRM group and 6 of 14 (43%) in the surveillance group. Mild distress (9–25) was observed in 8 participants: 1 (7%) in the RRM group and 7 (50%) in the surveillance group. Two participants had moderate distress (26–43), and one had severe distress (≥ 44). Although more participants in the RRM group were categorized as having no symptoms, the overall distribution of IES-R categories did not differ significantly between groups ($p = 0.058$) (Table 2).

Hospital Anxiety and Depression Scale

HADS scores were compared between the RRM and surveillance groups. The median anxiety (HADS-A) score was 5.0 (IQR: 2.0–7.0) overall: 4.0 (1.0–7.5) in the RRM group and 5.5 (3.0–6.0) in the surveillance group. The median depression (HADS-D) score was 4.5 (2.0–8.0) overall: 4.0 (2.0–8.0) in the RRM group and 5.0 (3.0–7.0) in the surveillance group. Neither anxiety nor depression scores differed significantly between groups (anxiety $p = 0.60$; depression $p = 0.96$) (Table 2).

Correlation and temporal variations of psychological scales

Exploratory analyses were conducted to examine the relationships among decisional regret and other psychological measures, as well as their temporal associations. DRS scores showed a moderate and statistically significant positive correlation with the total IES-R score (Spearman's $\rho = 0.51$, $p = 0.005$), indicating that greater decisional regret was associated with higher levels of cancer-specific psychological distress (Fig. 3A). In contrast, no significant correlation was observed between DRS and the total HADS score ($\rho = 0.17$, $p = 0.398$), suggesting that decisional regret was not strongly related to generalized anxiety or depressive symptoms in this cohort (Fig. 3B).

We further examined the associations between time since HBOC diagnosis and psychological outcomes. Neither IES-R nor DRS scores demonstrated significant correlations with time since diagnosis, indicating that cancer-specific distress and decisional regret did not show clear temporal attenuation or progression over time in this population (Fig. 3C and 3D).

Discussion

In this study of breast cancer survivors carrying germline *BRCA1/2* pathogenic variants, patients who chose RRM were less likely to experience high decisional regret (DRS ≥ 26) than those who chose surveillance. Although not statistically significant, a larger proportion of RRM participants were free of cancer-specific psychological distress on the IES-R, whereas mild psychological distress tended to be more common in the surveillance group.

Previous studies have consistently reported relatively high satisfaction following risk-reducing mastectomy (RRM). Decision aid intervention studies and randomized trials in women with pathogenic *BRCA1/2* variants have shown that adequate information provision and value-concordant treatment choices are associated with greater satisfaction and lower decisional regret (19, 20). A systematic review of high-risk women also reported generally favorable short-term patient-reported outcomes after RRM (21). In contrast, intensified surveillance may be associated with a persistent psychological burden related to repeated examinations. Breast cancer screening studies have demonstrated that false-positive results can increase anxiety and risk perception, with effects that may persist over time (22). Although surveillance strategies may be reasonable from a health-economic perspective, they are not necessarily superior in reducing psychological burden (23). These findings suggest that the higher decisional regret observed in the surveillance group in our study may be related to prolonged exposure to uncertainty and examination-related stress.

No significant differences in HADS anxiety or depression were observed between the RRM and surveillance groups. Psychological symptoms in women with breast cancer are influenced by individual vulnerability and social support rather than surgical modality alone (24). In our cohort, mean HADS scores were low, and many participants were several years beyond diagnosis, which may have attenuated potential group differences. Meta-analyses have reported reductions in HADS scores after breast surgery, including RRM in high-risk women (25). Prospective studies of *BRCA1/2* carriers have also shown short-term decreases in anxiety after RRM, whereas anxiety may persist with surveillance (5, 6). Differences in study design and timing of assessment may partly explain the absence of clear group differences in our cross-sectional analysis.

Exploratory analyses indicated that DRS was positively associated with cancer-specific stress (IES-R) but not with general anxiety and depression (HADS). This suggests that decisional regret may relate more to psychological burden specific to the cancer experience and treatment choices than to overall emotional state. A prior study of radiotherapy patients likewise found that DRS was independently associated with cancer-specific stress, whereas HADS showed no significant association (26), consistent with our

findings. Our study also found no significant associations between time since HBOC diagnosis and IES-R or DRS. Previous reports indicate that psychological distress decreases over time in unaffected *BRCA1/2* carriers (10); however, our study focused on breast cancer survivors, and psychological effects of treatment experiences and decisions may have outweighed the effect of time alone.

Cultural context influences psychological acceptance of RRM. Whereas 30–60% of *BRCA1/2* carriers in Western countries reportedly choose RRM, uptake is lower in East Asian countries including Japan (27, 28). Differences in values related to bodily invasiveness and breast loss and approaches to information provision by healthcare providers have been suggested as factors (29). Against this background, our study is novel in evaluating the association between the choice of risk-reducing mastectomy and psychological outcomes, including decisional regret, among Japanese individuals with breast cancer carrying *BRCA1/2* pathogenic variants. The low regret observed among Japanese patients who chose RRM suggests that, when appropriate genetic counseling and multidisciplinary support are provided, RRM may be psychologically acceptable in this population.

Age and individual circumstances also influence psychological outcomes after decisions. Younger patients may experience greater short-term psychological burden (24), whereas long-term regret may be lower when there are clear motivations such as family history or having children (30, 31). We observed no major differences between the RRM and surveillance groups in age, family background, or clinical factors, but the small sample size warrants further research.

This study has several limitations. It was a single-institution study with a small sample size, which limits statistical power, and participants' backgrounds were heterogeneous, so selection bias cannot be excluded. Patients choosing RRM may be psychologically more proactive or have higher tolerance for anxiety, which itself may contribute to lower regret. We could not fully assess the impact of RRSO on psychological status, limiting interpretation. In addition, because we did not directly assess psychological changes before and after intervention, causal inference is limited. We were unable to adjust for factors such as personality traits including optimism, social background and family support, preoperative quality of life, reconstruction surgery, and variability in genetic counselors' and surgeons' experience and explanation methods. Nevertheless, the novelty of this study lies in evaluating psychological impacts through the lens of cultural background, providing valuable insights from Japan to the international literature. Our findings highlight the importance of personalized decision support for HBOC patients, including comprehensive support encompassing genetic counseling.

In this cohort of Japanese breast cancer survivors with pathogenic *BRCA1/2* variants, choosing risk-reducing mastectomy was associated with a lower likelihood of high decisional regret compared with surveillance, although larger prospective studies are needed to confirm these findings.

Declarations

Conflict of interest

H.S. received honoraria for lectures and chairing sessions organized by Daiichi Sankyo, Eisai, Chugai, Kyowa Kirin, Eli Lilly, Pfizer, Taiho, AstraZeneca, Exact Sciences, MSD, and Gilead. S.S. received grants to his institution from Chugai, Daiichi-Sankyo, Eli Lilly, Gilead Sciences, and Nipro. S.S. also received honoraria for lectures and chairing sessions organized by Chugai, Daiichi-Sankyo, Eisai, Eli Lilly, Kyowa Kirin, and is also a stockholder of Daiichi Sankyo.

Compliance with Ethical Standards

The study was approved by the institutional ethics committee (E2024-0126). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Role of artificial intelligence in manuscript preparation

Artificial intelligence–based language assistance (ChatGPT) was used to support the drafting and editing of this manuscript. All generated content was carefully reviewed, revised, and approved by the authors, who take full responsibility for the accuracy, originality, and integrity of the work.

Author contributions

A.A. designed the study. A.A., M.T., H.I., S.S., and H.S. collected the data. A.A. analyzed and interpreted the data. H.S. and S.S. performed the statistical analysis. A.A., S.S., and H.S. drafted the manuscript, and H.S. and S.S. revised it critically. M.O. supervised the study. All authors read and approved the final manuscript.

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Data availability

The datasets used in this study are available from the corresponding author upon request.

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Figures

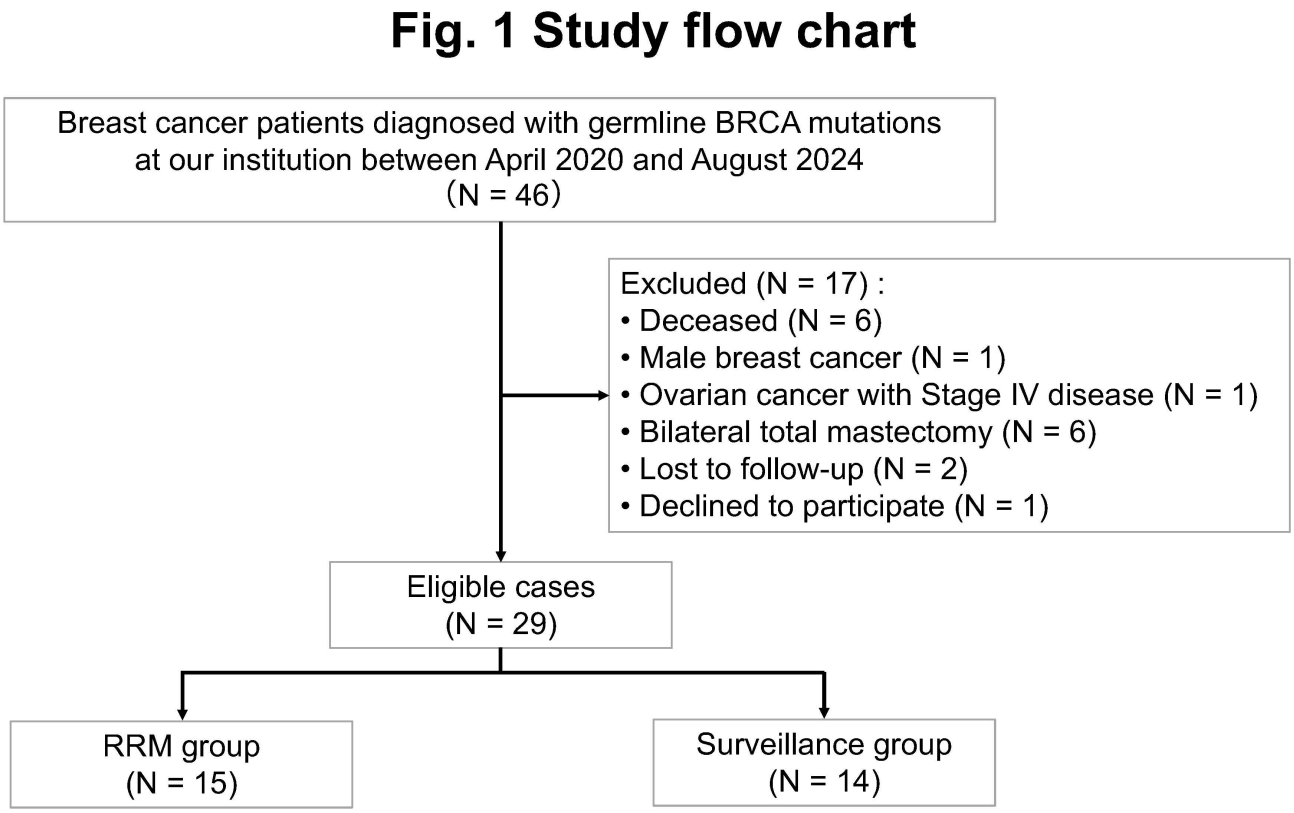


Figure 1

Study flow diagram.

Of 46 Japanese individuals with breast cancer carrying germline *BRCA1/2*pathogenic variants identified between April 2020 and August 2024, 29 eligible individuals were included in this cross-sectional analysis. According to management choice, patients were classified into a risk-reducing mastectomy (RRM) group (n = 15) or a surveillance group (n = 14).

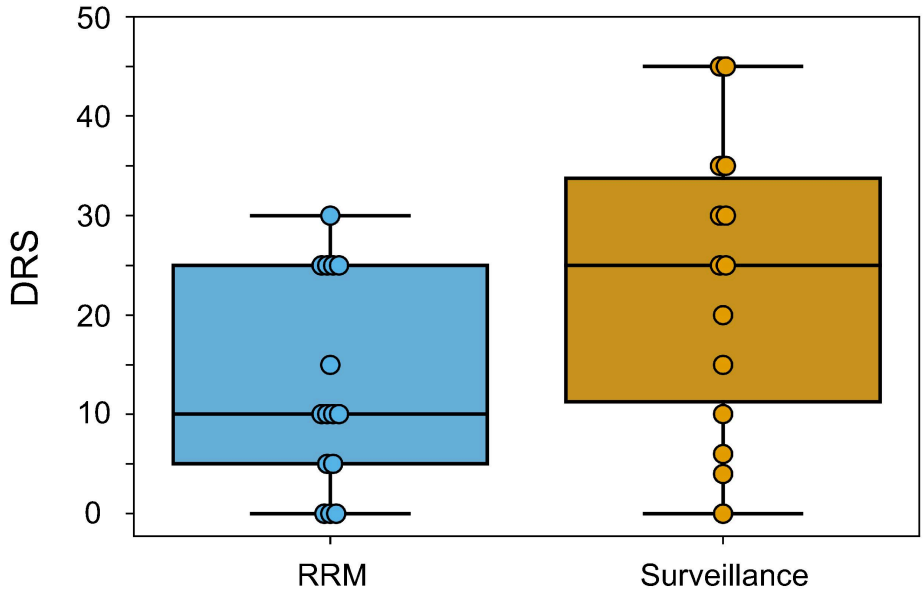


Figure 2

Distribution of decisional regret scale scores by management choice.

Box-and-whisker plots show DRS scores among patients who underwent RRM (n = 15) and those who chose surveillance (n = 14). Boxes represent the interquartile range, horizontal lines indicate medians, and individual points represent participants. Group differences were assessed using a two-tailed Mann–Whitney *U* test ($p = 0.055$). DRS, decisional regret scale; RRM, risk-reducing mastectomy.

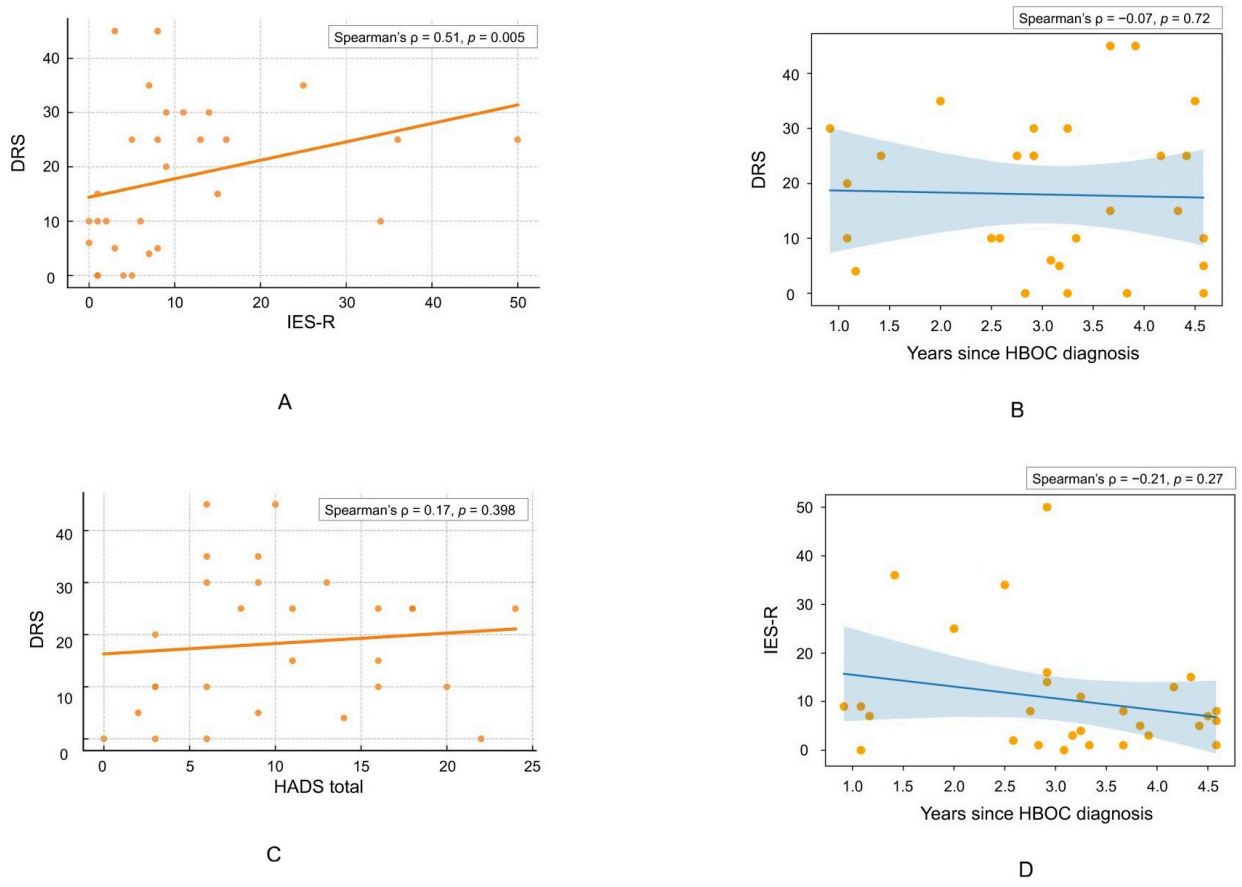


Figure 3

Associations between decisional regret and psychological distress.

(a) Scatter plot showing the association between the Decisional Regret Scale (DRS) and the total Impact of Event Scale–Revised (IES-R) score. A moderate positive correlation was observed, indicating that higher decisional regret was associated with greater cancer-specific psychological distress.

(b) Scatter plot illustrating the relationship between DRS and the total Hospital Anxiety and Depression Scale (HADS) score. No significant correlation was observed between decisional regret and generalized anxiety or depressive symptoms.

(c) Scatter plot depicting DRS scores in relation to years since hereditary breast and ovarian cancer (HBOC) diagnosis. No significant correlation was identified between decisional regret and time since diagnosis.

(d) Scatter plot showing IES-R scores in relation to years since HBOC diagnosis. Cancer-specific psychological distress did not demonstrate a significant association with time since diagnosis.

Each dot represents an individual patient. Solid lines indicate linear regression fits.

DRS, Decisional Regret Scale; IES-R, Impact of Event Scale–Revised; HADS, Hospital Anxiety and Depression Scale; HBOC, hereditary breast and ovarian cancer.