Supporting women with breast cancer in making an informed decision about immediate breast reconstruction: the development and evaluation of a patient decision aid

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Chapter 4

Decisional conflict in breast cancer patients considering immediate breast reconstruction

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ABSTRACT

BACKGROUND

Breast cancer (BC) patients who are treated with mastectomy are frequently offered immediate breast reconstruction. This study aimed to assess decisional conflict in patients considering immediate breast reconstruction, and to identify factors associated with clinically significant decisional conflict (CSDC).

METHODS

Baseline data of a multicenter randomized controlled trial evaluating the impact of an online decision aid for BC patients considering immediate breast reconstruction after mastectomy were analyzed. Participants completed questionnaires assessing sociodemographic and clinical characteristics, decisional conflict and other patient-reported outcomes related to decision making such as breast reconstruction preference, knowledge, information resources used, preferred involvement in decision making, information coping style, and anxiety. Multivariable logistic regression analysis was performed to identify factors associated with CSDC (score > 37.5 on decisional conflict).

RESULTS

Of the 250 participants, 68% experienced CSDC. Patients with a *slight* preference *for* breast reconstruction (odds ratio (OR) = 6.19, $p < .01$), *no* preference for or against breast reconstruction (OR = 11.84, $p < .01$), and a *strong* preference for *no* breast reconstruction (OR = 5.20, $p < .05$) were more likely to experience CSDC than patients with a *strong* preference *for* breast reconstruction. Furthermore, patients with more anxiety were more likely to experience CSDC (OR = 1.03, $p = .01$).

CONCLUSION

A majority of BC patients who consider immediate breast reconstruction after mastectomy experience clinically significant decisional conflict. The findings emphasize the need for decision support, especially for patients who do not have a strong preference for breast reconstruction.

HIGHLIGHTS

- A majority of patients considering immediate breast reconstruction experience decisional conflict
- Patients without a strong preference for breast reconstruction are more likely to experience decisional conflict
- Patients with more anxiety are more likely to experience decisional conflict

INTRODUCTION

Immediate breast reconstruction (BR) after mastectomy is increasingly performed (1-3). The choice for immediate BR after mastectomy largely depends on the values and preferences of the patient (4). A breast cancer (BC) patient treated with mastectomy has to decide whether or not to have immediate BR, and, if immediate BR is chosen, make a decision among the types of BR (i.e. with an implant, autologous tissue or a combination) that are available to her.

Decision making on immediate BR is complex as outcomes are uncertain and there are multiple reconstructive options with numerous advantages and disadvantages associated with each option (5). For example, BR may have a positive impact on patients' body image, self-esteem and quality of life after mastectomy, but it also increases the risk of surgical complications compared to mastectomy without BR (6-15). BR with autologous tissue often leads to a more natural looking and feeling breast, but it also entails additional scarring to the donor site (5). Patients undergoing mastectomy have to weigh these pros and cons to make a personal choice about which option is best for them (4, 16). Decision making is further complicated by the fact that patients often need to make this decision in a short period of time, between diagnosis and mastectomy. During this period it is common for patients to feel distressed and anxious (17-19), which may limit their cognitive functioning and decision making skills (20, 21).

The complexity of this decision might increase feelings of decisional conflict in patients considering immediate BR. Decisional conflict is defined as a state of uncertainty about the course of action to take (22). Behavioral manifestations of decisional conflict include feeling unsure about what to choose, wanting to delay the decision, questioning what is important, feeling distressed, wavering between the options, and constantly thinking about the options (23). Although a certain level of decisional conflict might be inherent when deliberately making a complex decision, high levels of decisional conflict are associated with delayed decision making, indecisiveness, and feelings of depression and regret (24-26). These outcomes should be prevented, especially in the context of BR, as the primary goal of BR is to improve psychosocial outcomes and patient satisfaction.

Literature is sparse on decisional conflict about immediate BR, and the factors associated with it. Therefore, in this study we aimed to assess the levels of decisional conflict in BC patients who consider immediate BR after mastectomy, and to identify factors associated with clinically significant decisional conflict (CSDC).

METHODS

STUDY SAMPLE & PROCEDURE

For this study we used baseline data from a multicenter randomized controlled trial evaluating the impact of an online patient decision aid (pDA) for BC patients who are considering immediate BR after mastectomy. For a detailed description of the trial see ter Stege et al. (27, 28). In short, patients were invited for trial participation by their surgical oncologist, nurse specialist or BC nurse during a routine treatment consultation in which the possibility of immediate BR was discussed. After written approval to share contact information with the researchers, patients were provided more study details and screened for eligibility via a telephone call by a member of the research team. Patients were eligible for participation if they were ≥18 years of age, diagnosed with BC or ductal carcinoma in situ, undergoing mastectomy, eligible for immediate BR and referred to a plastic surgeon. The consultation with a plastic surgeon had to be scheduled at least three working days after the study invitation to allow patients to have sufficient time to complete the informed consent form and baseline questionnaire, and to use the pDA before consultation. Participants were required to have internet access, basic computer skills and sufficient command of the Dutch language. Eligible patients who were interested in participating completed the informed consent form and baseline questionnaire via an online platform (29). They were subsequently randomized to either the intervention group, in which they received access to the pDA, or to the usual care group, in which they received a standard BR information leaflet from the Dutch Cancer Society. Participants were invited to complete follow-up questionnaires one week after consultation with their plastic surgeon, and three and 12 months after mastectomy.

MEASURES

Sociodemographic and clinical characteristics

We collected data on patient's age, country of birth, educational level, marital status, parity, body mass index (BMI), current smoking status, comorbidities, diagnosis, date of diagnosis, laterality, history of BC, prior BC treatment, hereditary or familial increased risk for BC, neoadjuvant therapy, and indication for adjuvant radiotherapy.

Decisional conflict

Decisional conflict was measured by the 16 item Decisional Conflict Scale (DCS) for which there is demonstrated reliability and validity (24, 25, 30, 31). Items are rated on a 5-point response scale (0=strongly disagree, 4=strongly agree), with positive statements having reversed scoring such that a higher score indicates higher decisional conflict. A total score is calculated, as well as five subscale scores (uncertainty (3 items), feeling informed (3 items), feeling clear about values (3 items), feeling supported (3 items) and effective decision making (4 items). Since consultation with a plastic surgeon had not yet taken place at the time of administration, the effective decision making subscale was omitted from baseline assessment. The total score was based on 12 items (DCS Total–12). According to the published scoring

algorithm, total and subscale scores were calculated by averaging the sum of the individual item scores, multiplied by 25 (25). Scores ranged from 0 (no decisional conflict) to 100 (extremely high decisional conflict). According to the published manual (25), scores of 25 or below are associated with implementing decisions, and scores exceeding 37.5 are associated with delaying decision making and feeling unsure about implementation. These cut-offs are derived from data in women considering preventive hormone therapy, whereby those who delayed their decision had average scores above 37.5 (unpublished data referred to in O'Connor et al. (1998) (32)). The cut-off (>37.5) served as a gold standard by which a checklist to screen on CSDC in clinical practice was validated (33).

Patient-reported outcomes related to decision making

Breast reconstruction preference (BR preference) was assessed by a study-specific item asking patients to indicate which of the following five statements suits them best: (a) 'I have a strong preference for BR', (b) 'I have a slight preference for BR', (c) 'I do not (yet) have a preference for or against BR', (d) 'I have a slight preference for no BR', or (e) 'I have a strong preference for no BR'.

Knowledge was measured with ten statements about BR that participants indicated as being "true/false/I don't know". These statements were translated and adapted from statements used in prior research evaluating knowledge in women with increased risk for BC deciding about risk-reducing mastectomy and BR (34). Statements concerned topics such as risk factors, recovery time, and the impact of BR on sensation in the breast (See Appendix A for full instrument). The total score is the number of correctly answered items, ranging from 0 to 10.

Information resources used were assessed with an item, asking participants to select all types of BR information resources they used from a set of predefined answers (i.e. surgical oncologist, plastic surgeon, nurse/nurse specialist, information leaflet(s), book(s), website(s), relative(s), scientific article(s), article(s) from magazines or newspapers, other).

Preferred involvement in decision making was measured by the Control Preferences Scale (CPS) (35). Patients were asked to select one of five statements that best reflected their preferred role in BR decision making: I prefer (a) to make the decision alone, (b) to make the decision alone, after considering the clinician's opinion, (c) to make the decision together with the clinician, (d) the clinician to make the decision after considering my opinion, (e) the clinician to make the decision alone.

Information coping style was assessed with the Threatening Medical Situations Inventory (TMSI) (36). This 24-item questionnaire measures cognitive confrontation [i.e., the tendency to actively search for information in case of a medical threat ('monitoring')], and cognitive avoidance [i.e., the tendency to avoid information/look for distraction in case of a medical threat ('blunting')] within the domain of a medical threat. It consists of four scenarios of threatening medical situations followed by three monitoring and three blunting alternatives [e.g., 'I plan to ask the specialist as many questions as possible' (monitoring) and 'I think things will turn out to

be alright' (blunting)]. Participants were asked to rate the extent to which the alternative is applicable to them on a 5-point scale (1 = not at all applicable to me, to 5 = strongly applicable to me). Total monitoring and blunting scores are obtained by summing the relevant items. Scores on both scales range between 12 and 60 (36).

Anxiety was measured by the 6-item state scale of the Spielberger State-Trait Anxiety Inventory (STAI-6) (37, 38). Participants were asked to indicate on a 4-point scale to what extent a state applies to them at that moment (1 = not at all, 4 = very much). A total score is calculated by taking the mean of the items multiplied by 20 and ranges from 20 to 80, with higher scores indicating more anxiety.

STATISTICAL ANALYSES

Descriptive statistics were used to characterize the sample and to evaluate the levels of decisional conflict. Decisional conflict was dichotomized into CSDC (score >37.5 on DCS) and no CSDC (score ≤ 37.5 on DCS) (25, 32). Based on literature (32, 39-42), and expert opinions, we evaluated possible explanatory variables for CSDC using logistic regression analysis. The following variables were considered for selection in the regression model: (1) Sociodemographic characteristics (age, country of birth, educational level [low (primary school, lower vocational education), intermediate (secondary school, intermediate vocational education), or high (higher vocational education, university)], marital status, BMI [underweight (BMI <18.5), normal (BMI 18.5-<25), overweight (BMI 25-<30), obese (BMI 30+)], current smoking status, number of comorbidities, type of hospital); (2) Clinical characteristics (time since diagnosis, laterality, prior BC diagnosis, diagnosis in irradiated breast(s), hereditary or familial increased risk for BC, indication for adjuvant radiotherapy); and, (3) Patient-reported outcomes (BR preference, knowledge, information resources used, preferred involvement in decision making, information coping style, anxiety). Explanatory variables were included in the multivariable model if the association with the outcome was significant at $p < .10$. Furthermore, if potential explanatory variables were strongly correlated with each other ($r > .80$), we selected one of the predictors to represent the whole set. Results of the multivariable model were considered statistically significant at a P value < .05. Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25 (IBM corp.).

RESULTS

PARTICIPANTS

Figure 1 shows the flowchart of the study. In total, 333 patients agreed to be informed about the study. Of these patients, 323 were reached by the research staff. Twenty-eight patients were ineligible. Of the remaining 295 patients, 37 were not interested in participating. The informed consent form and baseline questionnaire were sent to 258 patients. In total, 250 patients returned both and were included for analyses. This resulted in a participation rate of 85% (250/295).

BACKGROUND CHARACTERISTICS

Sociodemographic and clinical background characteristics are provided in Table 1. Patients had an average age of 50.12 years (SD = 11.03), and more than half (52%) were highly educated. The median time since diagnosis was three weeks (interquartile range (ICR) = 18), and 60% of the patients were recruited in a cancer-specific hospital.

DECISIONAL CONFLICT

The mean total and subscale scores are summarized in Table 2. Sixty-eight percent of the patients experienced CSDC. Statements with which most patients agreed, reflecting more conflict, were: 'I want more advice and information about the options', 'I am not sure what to decide', and 'this decision is difficult for me to make' (82%, 40%, and 39% (strongly) agreed, respectively). Statements with which the least patients agreed (or if appropriate disagreed), reflecting less conflict, were: 'I feel pressured by others in making this decision', and, 'I have enough support from others to make a choice' (4% (strongly) agreed and 7% (strongly) disagreed, respectively) (See Appendix B for results on all items).

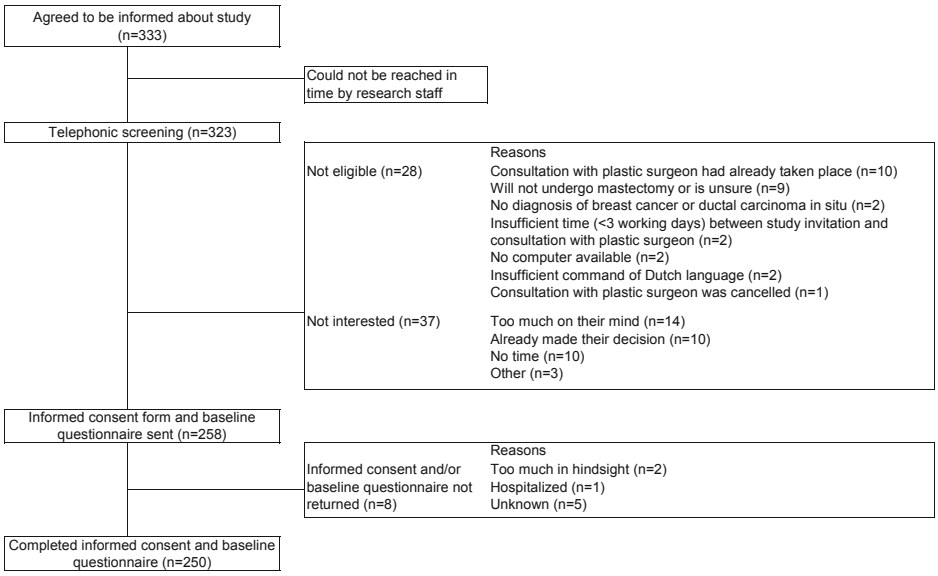

Figure 1. Flowchart of study participants

Table 1. Background characteristics (N=250)

	N	%
Age (years), M (SD)	50.12 (11.03)	
Born in NL	233	93
Highest level of education		
high	129	52
intermediate	109	44
low	10	4
missing	2	1
Married or in a relationship	214	86
Having children	199	80
BMI		
underweight (<18.5)	5	2
normal (18.5 - <25)	139	56
overweight (25 - <30)	75	30
obese (30+)	31	12
Current smoking status (yes)	14	6
Comorbidities		
none	128	51
1	79	32
2 or more	42	17
missing	1	0
Diagnosis		
invasive BC	151	60
invasive BC and DCIS	37	15
DCIS	61	24
other	1	0
Time since diagnosis (weeks), median (ICR)	3 (18)	
Bilateral diagnosis	12	5
Diagnosis in irradiated breast(s)	27	11
Prior diagnosis of BC and/or DCIS	40	16
Surgical treatment for BC and/or DCIS in the past		
breast conserving surgery	32	13
mastectomy	4	2
mastectomy with BR	5	2
Genetic predisposition or familial increased risk of BC	40	16
Neoadjuvant therapy	91	36

chemotherapy	86	34
hormone therapy	9	4
immunotherapy	23	9
Indication for adjuvant radiotherapy		
no	71	28
yes	61	24
maybe	75	30
I don't know	43	17
Type of hospital		
cancer-specific center	150	60
academic center	27	11
general hospital	73	29

Abbreviations. **M** mean; **SD** standard deviation; **NL** Netherlands; **BMI** body mass index; **BC** breast cancer; **DCIS** ductal carcinoma in situ; **ICR** interquartile range; **BR** breast reconstruction.

Table 2. Decisional conflict in breast cancer patients considering immediate breast reconstruction (N=250)

	M (SD)
DCS Total-12	46.18 (15.22)
CSDC, n (%)	169 (68%)
DCS subscales	
Uncertainty	48.40 (27.60)
Feeling informed	49.30 (22.26)
Feeling clear about values	45.43 (19.37)
Feeling supported	41.60 (14.46)

Abbreviations. **DCS** Decisional Conflict Scale; **CSDC** clinically significant decisional conflict; **M** mean; **SD** standard deviation.

FACTORS ASSOCIATED WITH CLINICALLY SIGNIFICANT DECISIONAL CONFLICT

Based on the univariable analyses ($p < .10$) and correlations among the potential explanatory variables ($r > .80$), the following variables were included in the multivariable logistic regression analysis: educational level, BR preference, being informed by scientific article(s), blunting coping style, and anxiety (see Appendix C for results of the univariable analyses).

The results of multivariable analyses are shown in Table 3. We found a significant effect for BR preference and anxiety. Specifically, patients with a *slight* preference *for* BR were 6.19 times more likely (95% Confidence Interval (CI) = 2.47-15.54), and patients with *no preference* for or against BR were 11.84 times more likely to experience CSDC (95% CI = 2.68 – 52.28) than patients with a *strong* preference *for* BR. Additionally, patients with a *strong* preference for *no* BR were 5.20 times more likely to experience CSDC (95% CI = 1.04-25.86) than patients

with a *strong* preference *for* BR. Patients with more anxiety were 1.03 times more likely to experience CSDC (95% CI = 1.01-1.06). No significant effects were found for educational level, blunting information coping style, and being informed by scientific article(s).

Based on the above results, we performed an explorative analysis into the association between anxiety and BR preference using Analysis of Variance. Group differences were accompanied by effect sizes (ES) (ES of 0.2 = small, 0.5 = moderate and clinically relevant, 0.8 = large) (43). Patients with a *strong* preference *for* BR were significantly less anxious (M (SD) = 44.15 (12.65)) than patients with a *slight* preference *for* BR (M (SD) = 48.30 (12.53), $p < .05$, ES = 0.33), and patients with *no preference* for or against BR (M (SD) = 50.20 (12.36), $p = .01$, ES = 0.48). And, although not significant, effect sizes show (almost) clinically relevant differences in anxiety between patients with a *strong* preference *for* BR and patients with a *slight* preference or a *strong* preference for *no* BR (M (SD) = 51.85 (11.32), $p = .08$, ES= 0.61, and M (SD) = 49.76 (15.66), $p = .12$, ES = 0.43, respectively).

Table 3. Multivariable logistic regression predicting clinically significant decisional conflict (N=248*)

	n	CSDC	B (SE)	*p*	OR	95% CI for OR
constant			-0.85 (1.24)	0.49	0.43	
Educational level						
low	10	40%	-1.37 (0.77)	0.08	0.26	0.06 - 1.16
intermediate	109	68%	-0.23 (0.32)	0.48	0.80	0.42 - 1.50
high	129	69%	ref			
BR preference						
strong preference for BR	142	52%	ref			
slight preference for BR	51	86%	1.82 (0.47)	**0.00**	6.19	2.47 - 15.54
no preference for or against BR	32	94%	2.47 (0.76)	**0.00**	11.84	2.68 - 52.28
slight preference for no BR	9	89%	1.63 (1.09)	0.13	5.10	0.60 - 43.21
strong preference for no BR	14	86%	1.65 (0.82)	**0.04**	5.20	1.04 - 25.86
Informed by scientific article(s)	21	48%	-1.08 (0.55)	0.05	0.34	0.12 - 1.01
Blunting coping style (TMSI)[A]			-0.01 (0.03)	0.70	0.99	0.94 - 1.04
Anxiety (STAI-6)[B]			0.03 (0.01)	**0.01**	1.03	1.01 - 1.06

Abbreviations. **CSDC** clinically significant decisional conflict; **B** beta; **SE** standard error; **OR** odds ratio; **CI** confidence interval; **BR** breast reconstruction; **TMSI** Threatening Medical Situations Inventory; **STAI-6** State scale of the State-Trait Anxiety Inventory.
Note. $R^2 = .30$ (Nagelkerke). Model $\chi^2(9) = 59.10$, $p<.001$. Significant values (at $p < .05$) are shown in bold.
*N=248 due to 2 missings on variable educational level.
[A]Mean = 34.02, Standard Deviation = 6.33
[B]Mean = 46.39, Standard Deviation = 12.91

DISCUSSION

Our results show that more than two thirds of BC patients considering immediate BR after mastectomy experienced clinically significant decisional conflict, and that this was associated with BR preference and anxiety. Patients with a *slight* preference for BR, patients with *no preference* for or against BR and patients with a *strong* preference for *no* BR were more likely to experience CSDC than patients with a *strong* preference *for* BR. In addition, patients with higher levels of anxiety were more likely to experience CSDC than patients with lower levels of anxiety.

To our knowledge, this is the first study in which decisional conflict regarding immediate BR was assessed in a large sample of BC patients. The levels of decisional conflict in our sample are comparable to the levels of decisional conflict in two prior studies in BC patients who considered delayed BR (44, 45), and relatively high compared to levels in a sample of BC patients who considered immediate BR (M = 33, SD = 24) (39), and to average decisional conflict regarding a variety of health-related decisions (31). The specific population, complexity of the decision, and the timing of our assessment might all have contributed in evoking higher decisional conflict (31). Highest baseline (before decision making) decisional conflict has been found among individuals who were ill and were making decisions for themselves (31), which is the case for our population. Furthermore, as the majority of participants in our study had only recently been diagnosed with BC and introduced to the possibility of BR, and all were waiting to be informed by a plastic surgeon, this will likely have contributed to the high levels in our sample.

Although we found a significant positive association between anxiety and CSDC, the association was weak. This is in line with the study of Manne et al. (2016) (39), in which they did not find any association between anxiety and decisional conflict regarding immediate BR. However, we do think it is a factor worth considering in future research, as we did find anxiety levels to differ between BR preference groups. Thus, the weak association could be attributed to effect modification in which the degree of association between anxiety and CSDC differs among different BR preference groups. Additionally, the association between anxiety and decisional conflict has been reported in other populations (46-48), and is in line with the conceptual framework of decisional conflict (22,24).

Intuitively, one would expect that patients with a *strong* preference for a certain option would experience less decisional conflict than patients with either a *slight* preference for - or with *no* preference for a certain option. However, this was only partially true in our results. Surprisingly, patients with a *strong* preference for *no* BR more frequently experienced CSDC than patients with a strong preference *for* BR. Although additional exploratory analyses comparing both groups demonstrated that patients with a *strong* preference for *no* BR were older (M (SD)= 56.9 (11.9), M (SD) = 48.1 (11.0), p = .005, data not shown), we did not find any between group differences that could explain these findings. However, consistent with our finding, Manne et al. (2016) found that BC patients who reported a greater number of reasons *not* to choose BR had higher decisional conflict (39), suggesting that patients who may tend to decline BR feel

more conflicted about their decision. Although speculative, based on clinical experience and interviews with patients about their experiences with decision making about BR (manuscript submitted), the possibility of BR is often communicated as something positive. Thus, patients who prefer not to have BR might perceive information provision as 'favoring BR over *no* BR', which may have contributed to increased decisional conflict.

Besides anxiety and BR preference, no factors were associated with CSDC. It is difficult to compare our results with prior findings, as literature on predictors of decisional conflict is scarce and heterogeneous in studied predictors and populations (e.g. individuals with diabetes (40), prostate cancer (41, 46), or tested for hereditary cancer (47)). However, the absence of associations with sociodemographic and clinical characteristics is largely consistent with a prior study in a comparable population (39), with the exception that we did not find an association with time since diagnosis. Furthermore, the absence of any association of decisional conflict with knowledge is in contrast to the conceptual model of decisional conflict (22,24). Possibly, decisional conflict might be more strongly related to a patients' perceived knowledge than their actual knowledge (24).

This study has several limitations. Our sample consisted of highly educated patients limiting the generalizability of our findings. Furthermore, since data were collected as part of a trial evaluating the impact of a patient decision aid, we might have included patients with relatively higher decision support needs, potentially leading to an overestimation of the levels of decisional conflict. Another limitation is that data on the psychometric properties of the total score of the Decisional Conflict Scale without the assessment of the Effective Decision Making subscale is lacking. Although the developers of the instrument indicated that this subscale should only be assessed in circumstances where a decision has already been made (24), and other studies also omitted it (48, 49), the reliability and validity of the instrument without the Effective Decision Making subscale needs to be confirmed. Finally, although the cutoff (>37.5) for CSDC has been used in prior research (24, 31, 50, 51), and a review that examined decisional conflict over time including 253 studies found support for it (31), more evidence on its validity in the context of BR decision making seems warranted.

The large sample size is considered a major strength of this study. Additionally, the timing of our assessment, namely during the short period between diagnosis and mastectomy, is highly relevant and rarely studied. While immediate BR after mastectomy is increasingly performed (1-3), previous studies have mainly focused on decisional conflict in patients who had already undergone mastectomy and were considering BR after completion of their oncological treatment (44, 45, 52).

Our results emphasize the need for support for BC patients in making this complex decision, especially for those patients without a strong preference for BR. Decisional conflict may be reduced by addressing contributors to uncertainty, such as providing information about benefits and risks for each option and helping patients understand their own values (32). The

use of decision aids as an addition to standard clinical counseling has been found to reduce decisional conflict, also in patients deciding about BR (52-55).

We conclude that the majority of BC patients who consider immediate BR after mastectomy experienced CSDC. Our results emphasize the need for support for BC patients in making this complex decision, especially in patients without a strong preference for BR.

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SUPPORTING INFORMATION APPENDICES

Appendix A. study-specific instrument to measure breast reconstruction knowledge

The following statements describe ideas that women can have about breast reconstruction. Some statements are correct, others are incorrect.

Indicate for all statements whether you think it is correct or incorrect. If you are unsure, you can select the answer 'I don't know'.

1. Breast reconstruction is only possible for younger women
2. Smoking increases the risk of complications of breast reconstruction
3. The recovery time from breast surgery with breast reconstruction will likely be longer than the recovery time from breast surgery without breast reconstruction
4. The sensation in a reconstructed breast is the same as in your own breast
5. Breast reconstruction is always done in one operation
6. Reconstruction with a breast implant is a more complex surgical procedure than reconstruction with tissue from your body
7. Complete removal of the breast with an immediate breast reconstruction increases the risk of complications as compared to complete removal of the breast without breast reconstruction
8. Breast reconstruction has no influence on the treatment of my breast cancer
9. Breast reconstruction has no influence my chances of survival
10. With breast reconstruction, it is always possible to preserve the nipple.

Scoring

The correct answers:

1. incorrect
2. correct
3. correct
4. incorrect
5. incorrect
6. incorrect
7. correct
8. correct
9. correct
10. incorrect

Appendix B. Results on items of the Decisional Conflict Scale

	M (SD)**	**(strongly) disagree, n (%)**	**neither agree or disagree, n (%)**	**(strongly) agree, n (%)**
This decision is difficult for me to make	1.86 (1.34)	113 (45%)	39 (16%)	98 (39%)
I am clear about the best choice for me*	2.02 (1.21)	91 (36%)	69 (28%)	90 (36%)
I am not sure what to decide	1.93 (1.31)	104 (42%)	46 (18%)	100 (40%)
I know which options are available to me*	1.84 (1.10)	74 (30%)	63 (25%)	113 (45%)
I know the benefits of breast reconstruction*	1.91 (1.06)	80 (32%)	61 (24%)	109 (44%)
I know the disadvantages of breast reconstruction*	2.16 (0.98)	97 (39%)	80 (32%)	73 (29%)
I want more advice and information about the options	3.22 (0.93)	14 (6%)	32 (13%)	204 (82%)
I am clear how much the benefits of breast reconstruction matter to me*	1.56 (1.08)	49 (20%)	68 (27%)	133 (53%)
I am clear how much the disadvantages of breast reconstruction matter to me*	1.80 (1.04)	57 (23%)	95 (38%)	98 (39%)
It is difficult to decide which (the benefits or the disadvantages) are most important to me	2.10 (1.10)	63 (25%)	104 (42%)	83 (33%)
I feel pressured by others in making this decision	0.64 (0.85)	211 (84%)	30 (12%)	9 (4%)
I have enough support from others to make a choice*	1.14 (0.94)	18 (7%)	63 (25%)	169 (68%)

Abbreviations. **M** mean; **SD** standard deviation.
*Positively stated items for which the answer '(strongly) disagree' reflects higher decisional conflict.
**A higher score (range 0-4) reflects higher decisional conflict.

Appendix C. Univariable logistic regression for clinically significant decisional conflict (N=250)

	B	SE	Wald	df	*p*	OR	95% CI of OR	
							Lower	Upper
Sociodemographic variables								
Age	-0.01	0.01	0.30	1	0.59	0.99	0.97	1.02
Country of birth (NL vs. elsewhere)	-0.47	0.59	0.65	1	0.42	0.62	0.20	1.98
Educational level*								
low	-1.21	0.67	3.21	1	0.07	0.30	0.08	1.12
intermediate	-0.05	0.28	0.03	1	0.86	0.95	0.55	1.65
high	-	-	3.24	2	0.20	ref	-	-
Marital status (married or in a relationship vs. not)	-0.42	0.41	1.04	1	0.31	0.66	0.29	1.47
BMI								
normal	-	-	0.87	3	0.83	ref	-	-
underweight	-0.40	0.93	0.18	1	0.67	0.67	0.11	4.17
overweight	-0.23	0.30	0.57	1	0.45	0.80	0.44	1.44
obese	0.09	0.44	0.04	1	0.84	1.09	0.47	2.57
Number of comorbidities**								
none	-	-	3.46	2	0.18	ref	-	-
1	0.51	0.31	2.60	1	0.11	1.66	0.90	3.06
2+	0.53	0.40	1.76	1	0.18	1.69	0.78	3.67
Current smoking status (yes vs. no)	-0.78	0.55	2.01	1	0.16	0.46	0.16	1.35
Type of hospital								
cancer-specific hospital	-	-	1.42	2	0.49	ref	-	-
academic hospital	0.56	0.49	1.28	1	0.26	1.75	0.66	4.61
general hospital	-0.04	0.30	0.02	1	0.89	0.96	0.53	1.73
Clinical variables								
Time since diagnosis (weeks)	0.01	0.01	0.24	1	0.63	1.01	0.98	1.03
Laterality (bilateral vs. unilateral)	-0.42	0.60	0.49	1	0.49	0.66	0.20	2.14
Prior BC diagnosis (yes vs. no)	0.13	0.38	0.13	1	0.72	1.14	0.55	2.38
Diagnosis in irradiated breast(s) (yes vs. no)	0.35	0.46	0.58	1	0.45	1.42	0.57	3.51
Hereditary or familial increased risk for BC								
no	-	-	0.26	2	0.88	ref	-	-
yes	-0.05	0.38	0.02	1	0.89	0.95	0.45	2.00
I don't know	-0.17	0.33	0.26	1	0.61	0.85	0.45	1.61
Indication for adjuvant radiotherapy								
no	-	-	1.09	3	0.78	ref	-	-
yes	0.34	0.38	0.81	1	0.37	1.41	0.67	2.95

Appendix C. Continued

	B	SE	Wald	df	*p*	OR	95% CI of OR	
							Lower	Upper
maybe	0.02	0.35	0.01	1	0.95	1.02	0.52	2.02
I don't know	0.23	0.42	0.30	1	0.59	1.25	0.56	2.83
Patient-reported outcomes								
BR preference								
strong preference for BR	-	-	31.93	4	0.00	ref	-	-
slight preference for BR	1.77	0.44	16.15	1	0.00	5.86	2.47	13.88
no preference for or against BR	2.67	0.75	12.73	1	0.00	14.45	3.33	62.67
slight preference for no BR	2.01	1.07	3.50	1	0.06	7.46	0.91	61.19
strong preference for no BR	1.72	0.78	4.85	1	0.03	5.60	1.21	25.90
Knowledge	-0.08	0.07	1.54	1	0.22	0.92	0.81	1.05
Informed by surgical oncologist (yes vs. no)	0.15	0.29	0.25	1	0.61	1.16	0.66	2.04
Informed by plastic surgeon (yes vs. no)	-0.58	0.41	1.97	1	0.16	0.56	0.25	1.26
Informed by nurse or nurse specialist (yes vs. no)	0.09	0.27	0.12	1	0.73	1.10	0.64	1.87
Informed by leaflet(s) (yes vs. no)	-0.43	0.27	2.49	1	0.12	0.65	0.38	1.11
Informed by book(s) (yes vs. no)	0.80	0.79	1.01	1	0.32	2.22	0.47	10.53
Informed by website(s) (yes vs. no)	-0.20	0.27	0.51	1	0.47	0.82	0.48	1.41
Informed by relative(s) (yes vs. no)	0.17	0.28	0.36	1	0.55	1.18	0.68	2.06
Informed by scientific article(s) (yes vs. no)	-0.92	0.46	3.97	1	0.05	0.40	0.16	0.99
Informed by newspaper or magazine(s) (yes vs. no)	-0.21	0.50	0.19	1	0.67	0.81	0.31	2.14
Total number of information resources used	-0.09	0.08	1.14	1	0.29	0.92	0.78	1.08
Preferred involvement in decision making (CPS)	0.17	0.19	0.88	1	0.35	1.19	0.83	1.71
Monitoring coping style (TMSI)	0.01	0.02	0.50	1	0.48	1.01	0.98	1.05
Blunting coping style (TMSI)	-0.04	0.02	3.84	1	0.05	0.96	0.92	1.00
Anxiety (STAI-6)	0.04	0.01	14.07	1	0.00	1.05	1.02	1.07

Abbreviations: **B** beta; **SE** standard error; **df** degrees of freedom; **OR** odds ratio; **CI** confidence interval; **NL** Netherlands; **BMI** body mass index; **BC** breast cancer; **BR** breast reconstruction; **CPS** Control Preferences Scale; **TMSI** Threatening Medical Situations Inventory; **STAI-6** State scale of the State-Trait Anxiety Inventory; **Ref** reference category.
*N=248. **N=249.