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# Mindfulness-based stress reduction for breast cancer patients: a mixed method study on what patients experience as a suitable stage to participate

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## Abstract

**Purpose** Breast cancer is associated with high levels of psychological distress. Mindfulness-based stress reduction (MBSR) has proven to be effective in reducing distress in cancer patients. In several studies, patients who are currently undergoing somatic anticancer treatment are excluded from participating in MBSR. Little is known about what would be the most suitable stage of disease to offer MBSR. We examined whether stage of disease facilitated and/or hindered participation in MBSR for breast cancer patients.

**Method** A mixed method design was used. Self-report questionnaires on psychological distress (HADS) and quality of life (EORTC QLQ-C30) were administered before and after MBSR. Five focus groups and three semi-structured individual interviews were conducted. Qualitative data were analyzed with the constant comparative method in order to develop a grounded theory.

**Results** Sixty-four females participated in MBSR. In 52 patients who completed the questionnaires, psychological distress improved significantly. Qualitative data showed that

participating in MBSR both during and after anticancer treatment has specific advantages and disadvantages. Interestingly, being emotionally ready to take part in MBSR seems equally important as physical ability. Informing patients at an early stage seemed to strengthen autonomy and self-management skills.

**Conclusions** In contrast to the common practice to tailoring the timing of MBSR to physical impairments or demands of the anticancer treatment, our findings revealed that emotional readiness is equally important to take into account. These findings might support professionals in their choices whether and when to inform and refer patients to MBSR.

**Keywords** Breast cancer · Mindfulness · MBSR · Timing · Disease stage · Qualitative

## Introduction

Breast cancer is the most common cancer among women with an estimated 1.67 million new cancer cases each year [1]. The invasive treatment and physical symptoms have a major impact on patients' wellbeing. Henselmans [2] showed that during active anticancer treatment, 33% of breast cancer patients suffer from psychological distress, 15% of patients experience distress directly after treatment in the reentry phase, and another 15% remain distressed for several years. So, psychological consequences of the cancer and/or its treatment seem to be long-lasting [3]. Psychological interventions have been shown to be effective in reducing these symptoms [4–6]. An innovative intervention in cancer patients is mindfulness-based stress reduction (MBSR). Mindfulness is defined as intentionally paying attention to present-moment experiences in an accepting

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and non-judgmental way [7]. Recent meta-analyses concluded that MBSR and other mindfulness-based interventions (MBIs) are effective in decreasing psychological distress in cancer patients [8, 9], including reductions of anxiety and depressive symptoms and improvement of quality of life.

With a few exceptions [10], in clinical practice and research settings, MBSR is mostly offered after the active anticancer treatment phase [11–13]. As anticancer treatment poses a burden on patients mental and physical wellbeing [2, 3], it can interfere with participation in psychosocial group interventions. When patients miss several sessions, the intervention might not be as effective.

Consequently, although one third of women experience psychological distress during active anticancer treatment, they often need to wait before they can participate in MBSR. Interestingly, a recent meta-analysis on uptake and adherence of psychological interventions for cancer patients demonstrated that patients were more likely to accept an intervention close to their diagnosis [14]. Patients who were offered a psychological intervention during active anticancer treatment were not, however, more likely to drop out than those who received a support offer before treatment.

Little is known about what patients themselves experience as the most suitable time to participate in psychosocial interventions such as MBSR. The aim of this study is to explore how patients experience the possible benefits and impediments of participation in MBSR during different stages of their anticancer treatment. This could be of help to practitioners and researchers in their choices about what is a suitable time to enroll patients in MBSR.

## Materials and methods

### Setting and study population

Patients with breast cancer were recruited at the departments of oncology of the Radboud University Medical Centre in Nijmegen, hospital Rijnstate in Arnhem, and through the website of a funding agency for breast cancer patients ([www.pinkribbon.nl](http://www.pinkribbon.nl)) from September 2012 to March 2014. Patients were included when they had been diagnosed with breast cancer, were at least 18 years old, and able to understand and use the Dutch language. No further eligibility criteria or sampling techniques were used. All participants provided written informed consent. The local ethics committee indicated that as this was an uncontrolled cohort study of an intervention already used in clinical care, no formal approval was required (registration number CMO 2012/493).

### Procedure

After referral, patients were invited for a research interview at the Radboudumc Centre for Mindfulness. They filled out self-report questionnaires on psychosocial functioning before and after MBSR. Some patients participated in MBSR for breast cancer patients only and they were invited for a focus group interview with their fellow participants 1 week after completion of the training. Some patients participated with their partner in MBSR for patients with various types of cancer. They were invited for an individual interview after completing the course.

### Intervention

MBSR consists of 8-weekly group-based 2.5-h sessions, a 6-h silent day between sessions 6 and 7, and daily 45-min home practice. The curriculum was based on the treatment format developed by Kabat-Zinn [7]. The sessions consisted of mindfulness practices, didactic teaching on stress, and sharing experiences with one another. Participants received a CD with guided meditations and a workbook with written information. To tailor the intervention to cancer patients, psycho-education about grief was added [15]. Furthermore, patients could invite their partner or close other to attend a session on mindful communication, discussing the impact of cancer on their relationship. The training was conducted by a qualified health professional and mindfulness teacher who fulfilled the mindfulness-based intervention teacher assessment criteria [16].

### Quantitative assessment

**Psychological distress** We used the total scale of the 14-item Hospital Anxiety and Depression Scale (HADS), which was developed to measure psychological distress in somatic patient populations. It consists of an anxiety and depression subscale [17].

**Rumination** The Ruminative Response Scale (RRS) was used to measure rumination and distinguishes a more adaptive thinking style (reflection) from a more maladaptive one (brooding [18]). We used the 5-item brooding subscale.

**Quality of life** The European Organization for Research and Treatment of Cancer (EORTC) Core Quality of Life Questionnaire (QLQ-C30) was used to assess quality of life [19]. It contains several functioning and symptom subscales. We used the Global Quality of Life, emotional and physical functioning subscales.

**Well-being** The 14-item Warwick-Edinburgh Mental Well-being Scale (WEMWBS) measures wellbeing [20]. It contains the majority of the range of concepts associated with positive

mental health: hedonic and eudemonic aspects, positive affect, satisfying interpersonal relationships, and positive functioning.

**Mindfulness** The 24-item Short Form of the Five Facet Mindfulness Questionnaire (FFMQ-SF) [21] is a valid and reliable alternative to the original FFMQ [22]. The FFMQ-SF can be divided into five facets: observing, describing, acting with awareness, non-judging of inner experiences, and non-reactivity to inner experiences. We used the total score.

**Self-compassion** The 12-item Short Form of the Self-compassion Scale (SCS-SF) [23] is a reliable and valid alternative to the original SCS [24]. The SCS-SF can be divided into six subscales: self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification. We used the total score.

### Qualitative assessments: Focus groups and interviews

To explore how patients experience participating in MBSR at different stages of their disease, focus groups and semi-structured individual interviews were used. The MBSR groups existed of a mixed group of breast cancer patients who participated both during and after anticancer treatment. Patients participated in MBSR for breast cancer patients only and they were invited for a focus group interview with their fellow participants 1 week after completion of the training.

Participants were asked the following question: “You participated in the MBSR training while you are in a certain treatment stage for breast cancer. How was it to participate in this stage you are in?” Focus groups took place at the Radboud Centre for Mindfulness 1 week after completion of MBSR, and lasted 100–120 min. Four focus groups were led by a psychiatrist and qualified mindfulness teacher (AS), and one focus group was conducted by a psychologist and qualified mindfulness teacher (EJ). Both interviewers had *not* been involved in teaching the MBSR training. The individual interviews were also conducted by EJ, by telephone, or face-to-face, and lasted 30–60 min. Focus groups and individual interviews started by explaining confidentiality and the explorative nature of the interview. Questions were asked in an open non-directive manner, allowing participants to speak freely about their experiences. For previous analyses on this qualitative data regarding the experience of peer support, see Schellekens et al. [25].

### Quantitative data analysis

Repeated measures ANOVAs were used to examine differences between baseline and post-treatment scores. To examine whether the timing of the intervention (during or after anti-

cancer treatment) is a moderator of the intervention, we added Timing as a between subjects factor and examined the corresponding interaction. In addition, we controlled the analysis for covariates (i.e., age, marital status, education, employment).

### Qualitative data analysis

The focus group and individual interviews were audio-taped and transcribed verbatim. A summary was returned to the participants for a member-check. Data analysis started after the first focus group had been transcribed, and continued with each additional focus group. Two researchers (EJ and MS, behavioral scientist and mindfulness teacher in training) coded the transcripts independently. After three focus groups, the codes were compared by three researchers (MS, EJ, and AS) until consensus was reached. This led to the identification of several themes. After five focus groups and three semi-structured individual interviews, saturation was reached. Four researchers MS, EJ, AS, and EB (psychiatrist and qualified mindfulness teacher) eventually grouped the subthemes into themes, in order to derive hypotheses from the data. After data analysis, relevant quotes were translated into English.

## Results

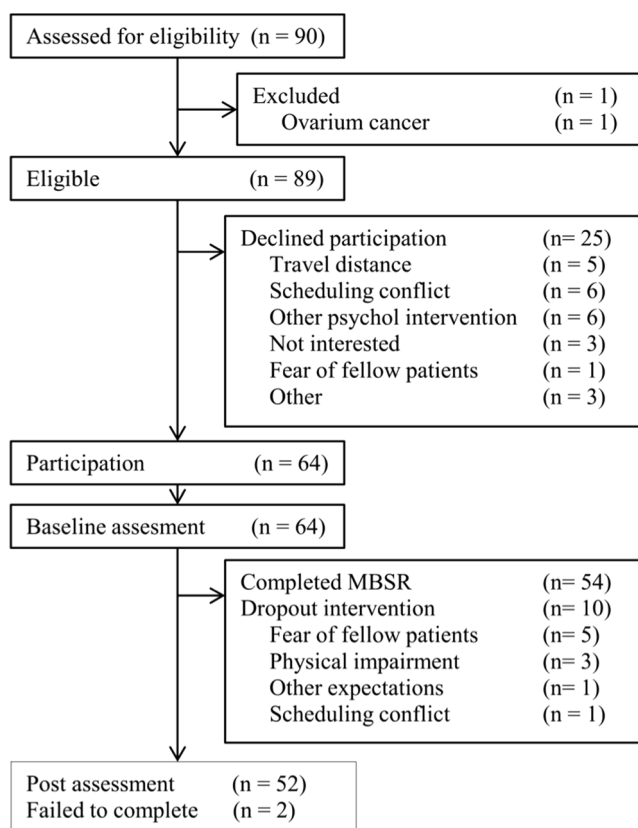
### Study sample

In total, 90 patients were recruited of whom 1 was excluded because she suffered from ovarian cancer. Of the 89 eligible patients, 64 (71%) participated (see Fig. 1 for study flow). As can be seen, the main reasons for declining participation were distance to the centre, scheduling conflicts, and participation in other psychological interventions.

The demographic and clinical characteristics of the 64 patients who started with MBSR are shown in Table 1. Of those who started, ten (16%) dropped out during the intervention. Patients who dropped out did not differ from those who completed the MBSR program. Main reasons for dropout were fear of fellow patients and physical impairments (see Fig. 1).

### Effects of MBSR

After MBSR, participants reported significantly less psychological distress ( $p = 0.03$ ,  $d = 0.44$ ). In addition, significant improvements were found in mindfulness skills ( $p = 0.01$ ,  $d = 0.48$ ), self-compassion ( $p = 0.00$ ,  $d = 0.6$ ), wellbeing ( $p = 0.03$ ,  $d = 0.31$ ), and physical ( $p = 0.06$ ,  $d = 0.40$ ) and emotional quality of life ( $p = 0.01$ ,  $d = 0.38$ ) (see Table 2). No significant improvement was found in rumination or global quality of life (all  $p$  values  $>.05$ ). Timing of treatment did not moderate the outcomes, except for mindfulness. Those



**Fig. 1** Study flow of patients

patients participating after anti-cancer treatment reported a larger increase in mindfulness skills than those participating during anti-cancer treatment, possibly because those participating after anti-cancer treatment reported a lower baseline score of mindfulness skills. When adding Timing of intervention to the analysis, the effects on emotional functioning ( $p = 0.11$ ) and wellbeing ( $p = 0.18$ ) were no longer significant. Controlling for baseline variables, age, marital status, education, and employment did not change the results.

### Qualitative results

Thirty-seven patients who participated in MBSR solely for breast cancer patients participated in the focus groups. Each focus group varied from 7 to 13 participants. Overall, 12 women participated during treatment and 25 participated after treatment. They were randomly divided over the focus groups. One palliative patient was interviewed individually, because she was not able to join the group. Two patients who participated with their partner in the group for mixed cancer patients were also interviewed individually. Both participated in MBSR during their anti-cancer treatment. The analysis of the five focus groups and three individual interviews resulted in three main themes: *MBSR during cancer treatment*, *MBSR after cancer treatment*, and *Participation in relation to emotional processing*. These themes could be subdivided into

seven subthemes (see Table 3). Patients experienced several advantages and disadvantages when participating in MBSR during and after medical treatment. Besides the treatment stage, emotional processing also seemed an important indicator of the most suitable time to enroll.

#### *Theme 1. Participation during anticancer treatment*

**MBSR supports coping with anticancer treatment** Many patients benefited from MBSR during treatment, which mainly consisted of chemotherapy but also long-term hormone treatment. They noted that what they learned during MBSR was immediately applicable to coping with their anticancer treatment. For instance, the training program in itself helped participants deal with their aversion to aspects of the somatic treatment.

You can apply it immediately, when you want to actively use it and if you need to learn to live in the moment especially, then it's immediately useful. Then maybe your ideas about that therapy change.

**Physical challenges** Several patients, however, were physically challenged to participate during their somatic treatment due to their illness and side-effects of the treatment. Participants mentioned that somatic symptoms or fatigue hindered attendance of the MBSR sessions and home practice. Others described how their somatic treatment schedule limited their time to participate.

Every three weeks I had chemo, so I was there on and off, I also missed two sessions because I really felt ill.

At the same time, a few patients mentioned that they had plenty of time during somatic treatment and that they were able to handle it physically.

#### *Theme 2. Participation after anticancer treatment*

**Physically stronger** The physical challenges experienced during treatment were not mentioned by participants who participated after treatment. In this phase, participants experienced their physical recovery as being facilitating. Patients had gained energy, felt physically stronger, and generally had a better physical condition. In turn, patients felt they also gained energy from participating in the MBSR.

So some time needs to pass, and then you have a little bit of energy and then with the training, you get the rest of the energy

**Table 1** Demographic and clinical characteristics of 64 patients who participated

Treatment phase	Total ( <i>n</i> = 64)		During ( <i>n</i> = 19)		After ( <i>n</i> = 45)	
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)
Age, <i>M</i> ( <i>SD</i> )	52.3	(8.0)	53.8	(7.5)	51.7	(8.3)
Marital status						
Married, living together	50	(78.1)	15	(78.9)	35	(79.5)
Divorced	13	(20.3)	4	(21.1)	9	(20.5)
Educational level <sup>a</sup>						
Low	1	(1.6)	0	(0)	1	(2.2)
Intermediate	25	(39.1)	7	(36.8)	18	(40.0)
High	38	(59.4)	12	(63.2)	26	(57.8)
Employment						
Paid job	35	(54.7)	11	(57.9)	24	(53.3)
Unpaid job	7	(10.9)	2	(10.5)	5	(11.1)
Disabled	20	(31.3)	5	(26.3)	15	(33.3)
Retired	2	(3.1)	1	(5.3)	1	(2.2)
Stage of disease						
Curative	58	(90.6)	16	(84.2)	42	(93.3)
Palliative	6	(9.4)	3	(15.8)	3	(6.7)
Time since diagnosis						
<6 months	13	(20.3)	12	(63.2)	1	(2.3)
6–12 months	18	(28.1)	5	(26.3)	13	(29.5)
>1 year	32	(50.0)	2	(10.5)	30	(68.2)

<sup>a</sup> Low educational level = primary and lower secondary education; intermediate = upper secondary education; high = higher vocational training and university

**Table 2** Baseline and post-assessment scores of 52 patients who completed participation

	Total		Main effect of treatment <i>p</i> value <sup>a</sup>	During treatment		After treatment		Main effect of Treatment	Interaction effect of treatment × timing <i>p</i> value <sup>b</sup>
	Baseline <i>M</i> ( <i>SD</i> )	Post <i>M</i> ( <i>SD</i> )		Baseline <i>M</i> ( <i>SD</i> )	Post <i>M</i> ( <i>SD</i> )	Baseline <i>M</i> ( <i>SD</i> )	Post <i>M</i> ( <i>SD</i> )		
Psychological distress (HADS)	12.6 (6.2)	10.2 (6.2)	.003	12.9 (6.2)	11.3 (6.4)	12.4 (6.2)	9.7 (6.1)	.013	.512
Rumination (RRS-BR)	9.0 (2.6)	8.4 (2.4)	.071	8.3 (2.3)	8.1 (1.4)	9.3 (2.6)	8.5 (2.7)	.219	.382
Quality of life (QLQ-C30)									
Global quality of life	66.7 (12.8)	70.5 (17.8)	.085	62.3 (12.9)	60.6 (22.7)	68.5 (12.5)	74.5 (13.8)	.362	.104
Physical functioning	84.5 (12.1)	88.0 (11.0)	.031	86.2 (7.7)	88.1 (9.0)	83.8 (13.6)	87.9 (11.8)	.031	.406
Emotional functioning	69.6 (17.3)	75.9 (15.7)	.014	71.1(16.0)	71.1(16.6)	68.9(18.0)	77.9(15.1)	.105	.105
Mindfulness skills (FFMQ)	80.9 (11.1)	85.5 (10.5)	.010	86.7 (9.9)	86.9 (9.8)	78.6 (10.8)	84.9 (10.8)	.025	.032
Self-compassion (SCS-SF)	3.2 (0.7)	3.6 (0.7)	.000	3.5 (0.57)	3.8 (0.48)	3.1 (0.71)	3.5 (0.73)	<.001	.673
Wellbeing (WEBWBS)	51.9 (7.0)	54.0 (7.2)	.028	54.3(7.1)	54.0(8.6)	50.9(6.8)	54.0(6.6)	.176	.095

<sup>a</sup> Repeated measures ANOVA using treatment (pre- and post-intervention measurements) as within-subjects factor; significance *p* < .05

<sup>b</sup> Repeated measures ANOVA using treatment as within subjects factor and timing (during or after cancer treatment) as between-subjects factor; significance *p* < .05

**Table 3** Themes and subthemes of what patients experience as a suitable stage to participate

Themes	Subthemes
Participation during anticancer treatment	MBSR supports coping with anticancer treatment Physical challenges
Participation after anticancer treatment	Physically stronger Too late to benefit
Participation in relation to emotional processing	Coping with emotions. Early empowerment Participation too early

**Too late to benefit** Participants noted that several months after treatment, they already experienced and coped with the fear and insecurities of diagnosis and treatment. They felt it was too late to fully benefit from the training and would have wanted to participate earlier. As one participant noted, she would have been able to move out of her survival mode much sooner. Others described they might have achieved more “clarity and peace” if there had been an opportunity to follow the training earlier, especially regarding work reintegration issues.

I think in that stage I.. in that stage when I tried to get back to work and get on with daily life, it would have clarified things for myself and it would have brought me some rest

### *Theme 3. Participation in relation to emotional processing*

**Coping with emotions** The participants noted that the timing of participation also depended on the willingness to emotionally engage with the MBSR, regardless of the treatment phase they were in. The need for psychological help depended on the degree of vulnerability patients allowed themselves to feel.

Are you okay with vulnerability or are you someone who says: no, I don't want this. That's what it depends on very much, I think.

**Early empowerment** Participants mentioned the value of being able to make their own decision about whether and when to take part. They preferred to be informed about MBSR as soon as possible in order to do so. It seemed to strengthen the sense of autonomy in patients.

You're in the hospital regularly anyway, they could address it sooner. Then you can decide for yourself, well it's too early for me or oh, I would like that

**Participation too early** A possible barrier of being informed about the MBSR training at an early stage is that patients may participate too early to fully benefit from the program. Some patients mentioned they were not emotionally prepared to participate, they felt too vulnerable to become aware of their thoughts and feelings.

I wanted something quickly, but in hindsight I think it might have been better to start a little bit later. Seeing what the chemo did to me, particularly mentally.

## Discussion

This mixed method study explored what patients experience as a suitable stage to participate in MBSR. Our quantitative findings confirmed previous studies in showing that in the whole group of breast cancer patients MBSR resulted in a reduction of psychological distress [8, 9]. The quantitative data showed that participating during or after anticancer treatment interacts with changes in mindfulness. Those participating after anticancer treatment seem to improve more; however, this could possibly be explained by lower baseline scores. The qualitative data revealed that although participating in MBSR during anticancer treatment helped patients to cope with the treatment, their physical symptoms could also hinder participation. After anticancer treatment, their gain in energy facilitated participation in MBSR, but some patients mentioned they participated too late to fully benefit. Finally, in addition to the cancer treatment phase, right timing also seemed to depend on the stage of emotional processing. Women emphasized the importance of being informed about the possibility to take part in MBSR at an early stage as it enabled them to decide for themselves whether and when to enroll. These qualitative findings are in line with former studies showing that patients would like to be offered psychological interventions soon after diagnosis [26–28]. A recent meta-analysis showed that the sooner after diagnosis psychological help was offered, the higher the uptake [14].

Nevertheless, a large part of cancer patients decline help, despite being distressed. Patients seem to believe that one's level of distress is not severe enough to warrant psychosocial interventions and prefer to manage on their own, even in the subgroup with high levels of distress [29]. When psychosocial care becomes more integrated into regular cancer care, psychosocial

interventions such as MBSR might become more acceptable and accessible for patients. However, as health care professionals focus on physical symptoms and treatment, emotional and psychological symptoms are often overlooked. Health care professionals also report lack of time and lack of confidence as barriers to address psychological symptoms [30]. Patients may be embarrassed or reluctant to mention their psychological problems to their physician [31]. Offering psychosocial help soon after diagnosis and providing clear information about the different options, such as MBSR, to all patients might be a first step. It might contribute to the patients' autonomy and self-management skills at a moment when they are deprived of these in many ways.

### Strengths and limitations

Breast cancer patients with different disease and treatment stages were all welcome to participate, enabling us to explore how women experienced the timing of participating in MBSR. Quantitative findings were presented with qualitative findings to provide an overview of the effects and experiences of MBSR participation. As a relatively large sample of breast cancer patients participated in the focus groups, we reached data saturation and reported on a broad view of experiences. We also performed member-checks, ensuring the interpretation of the data was valid. The study also has a number of limitations. The focus groups were mixed, in line with the mixed group of patients (both during and after anticancer treatment) participating in the intervention. For the aim of this study, we might have gained more specific information about timing of the intervention, by interviewing them separately. The quantitative results were uncontrolled; we did not carefully register all psychosocial treatments participants might have been using. Most of our patients were in a curative stage. In addition, the women who dropped out the intervention were not invited to the focus groups or individual interviews. Although these women provided reasons for dropping out (i.e., fear of fellow patients and physical impairments), unfortunately they did not provide information on how they experienced the time of enrollment and whether the stage of anticancer treatment might play a role in dropping out the intervention.

### Clinical implications and further research

Several factors should be taken into account when helping breast cancer patients interested in MBSR to time their participation. To stimulate patients' self-management,

information on MBSR should be provided in an early stage. This can help patients to decide for themselves when they are emotionally ready to participate. Health care professionals should be alert on those women who 'rush into it' as they might still be too vulnerable to become mindfully aware of their thoughts, emotions, and bodily sensations. Capability building strategies for health care professionals might support them addressing these issues with patients [32]. Patients should also be informed about how physical symptoms can hinder participation, especially during anticancer treatment.

Depending on women's physical symptoms, participation in MBSR can be experienced as beneficial both during and after anticancer treatment. Future research could examine whether participation during and after anticancer treatment is equally feasible and effective for women with breast cancer. Additionally, it would be interesting to study whether these results extend to cancer patients with a higher symptom burden (e.g., lung cancer). Alternatively, future studies could further explore whether tailored version of the MBSR program, such as online or blended versions, might make MBSR more accessible for patients currently undergoing anticancer treatment [33].

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