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Mindfulness in Follow-Up Care After Breast Cancer: Can It Prevent Recurrence?

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Summary

This review focuses on the question whether mindfulness in follow-up care can contribute to the prevention of breast cancer (BC) recurrence. We first introduce behavioral risk and protective factors in follow-up care by presenting current research outcomes modulating individual risk for recurrence. We argue that although increased self-awareness is undoubtedly beneficial for BC survivors, it may also trigger adverse effects in vulnerable individuals such as overarousal and impaired emotional regulation. Indeed, research shows that many BC survivors are often confronted with clinical levels of fear of recurrence and anxiety and depressive symptoms. Research on awareness about the impact of behavior on health and fear of recurrence also offers interesting insights which can help to better understand non-compliant responses of BC survivors to medical recommendations regarding lifestyle or screening in follow-up care. Given the high rate of clinically relevant symptoms such as fear of recurrence and anxiety that may be related to dysfunctional levels of self-monitoring, we review the effects of a therapeutic intervention called Mindfulness-Based Stress Reduction (MBSR) that appears promising in reintegrating self-observation with patient well-being.

Introduction

Considering that in 2014 breast cancer (BC) was the most common kind of cancer among women in Germany (30.5% of all new cancer diagnoses) as well as the most frequent cause of cancer-related death (17.4%), and that 1 in 8 women born in Germany is highly probable to develop this disease at some point in her lifetime [1], awareness about behavioral risk and protective factors is of central importance and should be promoted.

Research suggests that women's lifestyle, both before and after BC, may have an impact on their future overall and breast health and on the possibility of an early diagnosis of primary BC and BC recurrence [2–6]. Nowadays, many cancers are curable provided that they are detected at an early stage of the disease. Lifestyle-related factors like low physical activity, high body mass index (BMI), as well as tobacco and alcohol consumption have been associated with incrementing the individual risk for BC and recurrence [7, 8]. More recent research has additionally focused on behavioral factors that are also crucial for early diagnosis. Awareness about early warning signs and symptoms of BC, participation in BC screening programs, and habits like regular breast self-examination are among the most common means of detecting BC, with the latter being less effective for early detection [5, 6, 9].

Irrespective of these undoubtedly beneficial effects, an increased self-awareness including careful self-monitoring for cancer and especially recurrence might also enhance levels of arousal, with possible adverse effects varying from dysfunctional levels of alertness to emotional dysregulation, and, in extreme cases, demoralization and psychopathology. Anxiety, depression, and hypochondriac tendencies are, for example, known to be overrepresented in BC patients in comparison to the general population or other non-BC cancer populations [10–13]. Modern psychotherapeutic approaches such as Mindfulness-Based Stress Reduction (MBSR) [14] appear promising in balancing the necessity of self-monitoring with one's own psychological well-being by fostering a non-judgmental attitude towards one's perceptions.

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Behavioral Risk and Protective Factors for BC Recurrence

There are several lifestyle factors that are assumed to have an impact on the risk of BC onset and recurrence, such as physical activity, diet, BMI, smoking, and alcohol consumption.

Several epidemiological studies suggest, for example, that higher levels of physical activity in childhood [2] and in adulthood [3] are related to a reduction in BC incidence in adulthood. The meta-analysis by Kyu et al. [3] aimed to quantify the dose-response association between total physical activity and BC risk in a big sample (50,949,108 person years); they found that the risk of BC among women who were highly active (≥8,000 metabolic equivalent minutes/week of total physical activity) was reduced by 14% (relative risk 0.86, 95% uncertainty interval 0.83–0.90) if compared with insufficiently active women (reporting less than 600 metabolic equivalent minutes/week, which corresponds to the minimum dose recommended by the WHO for gaining health benefits). To better understand this result, the authors explain that 600 metabolic equivalent minutes/week correspond to about 150 min/week of brisk walking or 75 min/week of running. According to the review by Pudkasam et al. [4], the impact of physical activity on BC risk can be explained by different mechanisms such as beneficial effects on the immune system and loss of body fat which in turn diminishes estrogen and insulin concentrations. In addition to studies on the relationship between physical activity and BC incidence, research has also focused on the impact of physical activity on BC survivors. Guldberg et al. [7], on the basis of a large cohort study (n = 4,917) suggested that a higher BMI (especially among premenopausal women), reduced physical activity, and greater alcohol consumption at the time of diagnosis were all associated with a poorer prognosis. However, further studies showed that BC survivors who adopt a healthier lifestyle after diagnosis can also reduce their mortality risk [8, 15–17]. In a systematic review of 17 observational studies, Ballard-Barbasch et al. [8] found that physical activity not only before but also after BC diagnosis is associated with a reduction in mortality (both BC-specific and overall mortality). Similarly, gaining weight after a BC diagnosis was found to be a predictor for disease recurrence and poorer chance of survival [17, 18].

Several other studies aimed to determine whether the association between physical activity and mortality risk after BC is influenced by other factors such as menopausal status or BMI. Research on postmenopausal BC survivors suggests, for example, that high levels of physical activity (3 h fast walking per week) before and after BC diagnosis in postmenopausal women had significant impact on mortality [17]; in particular, high levels of physical activity after diagnosis reduced all-cause mortality by 46% and BC mortality by 39% in their sample (n = 4,643), even among women reporting low physical activity prior to diagnosis. A prospective study on the benefits of physical activity after BC diagnosis likewise found a positive effect of physical activity on BC mortality in obese women (BMI > 30), albeit without substantial differences in relation to menopausal status [15]. Another study [16] found that a healthy lifestyle including moderate physical activity and high vegetable and fruit intake is associated with greater survival (50% risk reduction) in BC patients, apparently without an effect of obesity on survival. Although additional results are needed to further elucidate the precise interactions between BMI, physical activity, and menopausal status in BC survivors, these studies suggest that a healthy lifestyle including moderate physical activity is clearly beneficial to support general health and might positively influence overall mortality. In light of this evidence, the mentioned lifestyle modifications might likewise be recommended for obese patients. In contrast, other reports have sounded a note of caution with respect to large weight changes given that in their samples both large weight loss in overweight BC patients ('obesity paradox') and substantial weight gain among normal-weight BC patients have been associated with increased mortality [19, 20]. An increased risk of overall mortality has also been related to comorbidities in women who lost weight. In view of this evidence, the authors concluded that maintaining a stable weight after BC diagnosis is related to better overall survival outcomes. Thus, the hitherto available evidence is still heterogeneous and complex. Given possible selection biases of observational studies and other unknown confounding factors, the hypothesized reduction in cancer-associated mortality by lifestyle modification has not yet been definitively proven.

Interestingly, although an accumulating body of evidence suggests that a change in lifestyle after BC diagnosis can have a powerful impact on prognosis, most patients do not implement healthier habits after diagnosis. Only 56% of BC patients engage in regular exercise after diagnosis, and only 47–73% consume the recommended 5 servings a day of fruit and vegetables and reduce their fat intake [21] (n = 531). In line with these results, previous research on lifestyle change interventions in the general population has already pointed out that producing substantial changes in risk behavior through advice provided by general practitioners is a very difficult task (systematic review [22]). Specifically with regard to BC survivors, research suggests that BC survivors who diminished risk behaviors and adopted healthy behaviors were also likely to believe that unhealthy diet, insufficient exercise, or alcohol consumption contributed to their cancer or that these behaviors possibly affect recurrence [23, 24]. These findings highlight that awareness about the impact of behavior on one's own health is fundamental to changing health-related behavior.

BC Awareness in the General Population and in BC Patients

The individual risk of BC or BC recurrence is not only influenced by a lifestyle that takes into account risk and protective factors, but also by knowledge of BC signs and symptoms as well as of BC screening programs. However, knowledge about non-lump BC symptoms might be generally low in non-BC women [9]: While less than half of the women in this sample (n = 712) were aware of changes in size as a possible sign of BC, less than 20% indicated nipple rush and redness of the skin as possible BC symptoms.

These results are in line with a Swiss study [5] that showed that only 10% of the women in their sample (n = 1721) decided to have a mammography by themselves, whereas most women who participated in BC screening were motivated by a gynecologist or general practitioner. A lack of knowledge about signs and symptoms as well as a low rate of breast self-examination and self-initiated mammography can be very critical, given that a diagnostic delay of as little as 3–6 months appears to be associated with lower survival [25, 26].

Further findings suggest that BC awareness is significantly related to different psychosocial factors, especially education. For example, women with higher education are likely to be more aware about risk factors for BC [9], whereas women with a lower level of formal education appear less likely to have adequate knowledge about BC and to report BC screening behaviors [27]. Also, cultural differences seem to play a central role, since breast self-examination rates were found to strongly vary between countries such as Iran (where 17% of women examine their breast once a month) and the USA (where 75% of women conducted at least 1 self-examination in the last year) [27].

The situation among BC survivors is very similar. Here, BC awareness also plays a central role in the detection of BC recurrence. Detection rate and time seem to be strongly dependent on the investigator. According to Kapoor et al. [6] (n = 115), BC recurrence seems to be primarily detected by the patients themselves (77%). These results led the authors to conclude that empowering patient detection strategies could increase their survival chances by enhancing BC awareness and their capacity to detect recurrence earlier.

On the other hand, higher levels of BC awareness in follow-up care might leave patients confronted more directly with their uncertainties and fear of recurrence. In particular, BC survivors appear vulnerable to fears related to threats to their health, future treatment, and the possibility of death (n = 169) [28]. According to the literature, approximately 23–70% BC survivors report relevant levels of ongoing fear of recurrence or disease progression [10, 29]. Thewes et al. [10] found that, in a sample of women with an early BC diagnosis and aged between 18 and 45 years, higher levels of fear of cancer recurrence were associated with a higher frequency of unscheduled visits to the general practitioner, self-examination for cancer (e.g., breast self-examination) than recommended, alternative and complementary therapy use, and counselling and support group visits. Interestingly, these women reported more frequently that they did not partake in cancer screening in the past year.

In order to better understand dysfunctional behaviors like lack of compliance with screening recommendations in women with higher levels of fear of recurrence, it is helpful to look at their association with psychopathology and predictive factors. Generally, BC patients are more likely (>40% 4-week prevalence) than the general population (20% 4-week prevalence) to develop mental disorders (particularly anxiety and adjustment disorders; [13]). Anxiety and depression were found to be associated with fear of cancer recurrence (n = 1,281, of which n = 536 with BC) [30]. In this study, fear of recurrence could be predicted by a combination of factors collected 1 year before including demographic (lower social class), medical (number of symptoms, level of pain, and certain types of cancer such as skin, colon, or hematological cancer), and psychosocial variables. Predictive psychosocial factors of fear of recurrence were, according to this study, depression, perceived lower social support, and adverse social interactions.

Taken together, these findings suggest that on the one hand, among the general population, women often have poor knowledge about certain BC signs and symptoms and show little self-initiative regarding participation in screening programs; on the other hand, once diagnosed with BC, many women, and especially younger patients, tend to develop clinical levels of fear of recurrence as well as psychopathology. Fear of recurrence can be predicted by a combination of factors; in particular, the psychological load due to poor social support and depression while coping with the consequences of severe physical impairment might hinder the capacity to cope with the 'collateral effects' of BC awareness and to adaptively regulate fear of recurrence. Addressing fear of recurrence appears to be relevant also for compliance with BC treatment, since affected patients might tend to not adhere to follow-up care in favor of self-monitoring and alternative medicine.

Mindfulness-Based Stress Reduction in Follow-Up Care

Mindfulness refers to a meditation practice derived from Buddhism that focuses on present moment awareness and encourages a non-judgmental attitude towards human experiences by promoting acceptance [14]. According to Kabat-Zinn [31], 'mindfulness' indicates a special form of attention to the present moment that is characterized by an affectionate, compassionate attitude and by genuine curiosity and interest for inner experiences. On the basis of these ideas, Kabat-Zinn [31] devised the so-called 'Mindfulness-Based Stress Reduction' (MBSR) as a structured group intervention in 8 sessions for patients with a variety of chronic clinical conditions (see also [32]).

According to a growing body of research, this program shows effects not only on psychological variables but also on biological markers. A non-systematic overview of selected MBSR results in BC patients is given in table 1.

Evidence shows that MBSR is an effective intervention to reduce fear of recurrence, anxiety, and depressive symptoms in BC patients [33–36]. Due to the association between fear of recurrence and poor participation in screening and follow-up care, MBSR can be particularly recommended to BC patients who show predictive factors for fear of recurrence, such as higher levels of pain, higher number of symptoms, depressive symptoms, lack of supportive social relationships, and relationship conflicts. However, since improvements related to symptoms like anxiety tend to disappear at the latest 1 year after the intervention, regular participation in MBSR group interventions to refresh learned skills should be also recommended [37].

Table 1. Empirical evidence on Mindfulness-Based Stress Reduction (MBSR) in breast cancer (BC) patients

Authors (year of publication) [ref.], study design	Patient sample, n	Dependent variables	Effects of MBSR
Controlled studies (including randomized controlled trials, RCTs)			
Campbell et. al. (2012) [41], wait-list controlled study (not randomized)	n = 70 women with cancer having completed all treatments except adjuvant therapy; of these, 74% were BC patients	present-centered attention, awareness, rumination, blood pressure (BP)	higher levels of mindful attentiveness and decreased ruminative thinking, reduction in systolic BP observed for MBSR participants with higher BP
Carlson et al. (2013) [39], RCT with parallel groups	n = 271 distressed BC survivors (stages I–III)	mood, cortisol, stress, quality of life, social support	improvements in stress levels, quality of life, and social support; more normative diurnal cortisol profiles than controls; this result was common also to the other experimental condition of this study (supportive-expressive psychotherapy)
Henderson et al. (2012) [37], RCT with parallel groups	n = 172, with stage I or II BC, newly diagnosed (within 2 years before study), aged 20–65 years	depressive symptoms, anxiety symptoms, general distress, self-esteem, social support, resilience in the face of adversity, emotional control, cancer-specific coping and emotional responses	improvements in the follow-up after 4 months in meaningfulness, depression, paranoid ideation, hostility, anxiety, unhappiness, and emotional control; results declined at 12- and 24-month follow-up
Hoffman et al. (2012) [40], RCT with wait list	n = 229 women after surgery, chemotherapy, and radiotherapy for BC stage 0–III	mood (including: anxiety, depression, anger, vigor, fatigue, and confusion); concerns regarding physical, social, emotional, and functional well-being; menopausal symptoms; general well-being	improvements after MBSR: mood, anxiety, depression, anger, vigor, fatigue, and confusion; breast- and endocrine-related quality of life; emotional, physical, social, and role functional well-being; general well-being
Lengacher et al. (2009) [34], RCT (MBSR vs. usual care)	n = 84 BC survivors within 18 months of treatment completion with surgery and adjuvant radiation and/or chemotherapy	depression, anxiety symptoms, fear of recurrence	improvements in depression, anxiety, and fear of recurrence, along with higher energy, physical functioning, and physical role functioning; no significant differences in perceived stress and optimism
Lengacher et al. (2014) [33], RCT (MBSR vs. usual care)	n = 82 BC post-treatment (stages 0–III)	perceived stress, depressive symptoms, state anxiety, trait anxiety, and aggregate mental and physical health, fear of recurrence, optimism, social support, quality of life (including physical functioning)	improvements in fear of recurrence and improved physical functioning which additionally mediated positive effects of MBSR on stress and state/trait anxiety; MBSR was also associated with improvements in depressive symptoms and energy, which in turn tend to improve the general mental and physical well-being of BC survivors (this result was just a trend, not statistically significant)
Meta-analyses			
Cramer et al. (2012) [36], meta-analysis and systematic review	n = 327, all BC patients from 3 RCTs	depressive symptoms, anxiety symptoms, spirituality	in comparison to usual treatment, MBSR was associated with lower levels of depression and anxiety; no effects on spirituality
Hofmann et al. (2010) [35], meta-analysis	n = 1,140 participants including patients with cancer, generalized anxiety disorder, depression, and other psychiatric or medical conditions	anxiety and mood symptoms	significant improvements in anxiety and mood symptoms in patients with cancer

Table 1. *Continued on next page*

Table 1. *Continued*

Authors (year of publication) [ref.], study design	Patient sample, n	Dependent variables	Effects of MBSR
Other studies (cohort studies, non-controlled studies, pilot studies)			
Carlson et al. (2007) [42], pre/post intervention and 1-year follow-up study, non-controlled study	breast and prostate cancer patients (total n = 59; BC patients n = 49, stage I-II)	quality of life, mood state, stress, immune and cortisol parameters, blood pressure	improvements in responses to stress, also after 1 year, and in quality of life and blood pressure, also at follow-up; no improvements in mood disturbance; decrease in cortisol levels from pre- to post-intervention and in follow-up; downward trends in T-cell production of pro-inflammatory cytokines
Lengacher et al. (2012) [38], pilot study	n = 84 BC survivors within 18 months of treatment completion with surgery and adjuvant radiation and/or chemotherapy	severity of symptoms (e.g., pain, fatigue, sleep disturbance, drowsiness, lack of appetite); degree to which symptoms may interfere with daily functioning	moderate improvements in fatigue and sleep disturbance
Matousek and Dobkin (2010) [43], cohort study	n = 59 women after BC treatment	perceived stress, depression, medical and psycho-social symptoms (e.g., pain or gastrointestinal symptoms); coping with health injuries, sense of coherence, mindfulness	improvements in stress, depression, and medical symptoms, and in mindfulness, coping with illness, and sense of coherence; changes in mindfulness were significantly related to changes in depression, stress, emotional coping, and sense of coherence; increases in mindfulness and sense of coherence predicted reductions in stress

Additional benefits may include an increase in quality of life and general well-being, improvements across a variety of conditions such as fatigue, sleep disturbances, rumination, elevated systolic arterial blood pressure, meaningfulness, paranoid ideation, hostility, unhappiness, emotional control, anger, vigor, confusion, and reported levels of energy [33, 37–42]. Regarding the question of whether MBSR may also be useful for BC patients to reduce stress, outcomes show clear results for improvements in the responses to stress [33, 39, 42] and a trend [34] as well as a significant change [43] for improvements in the perception of stressful situations. Significant changes regarding spirituality and optimism could not be found [34, 36].

In daily life, we usually rely on 2 ways of dealing with distressing experiences like for instance negative emotions, pain, or a guilty conscience. Conventionally, we either use distraction, repression, or numbing (alcohol, drugs, etc.) to turn away from those negative experiences at the price that we lose touch with ourselves or are otherwise entirely focused on those negative experiences in a ruminative manner, thereby becoming highly identified by and absorbed with them. Both coping styles, albeit functional in certain circumstance, will not do any good in the long run. Mindfulness offers a third way of dealing with negative experiences that avoids the negative aspects of the other two. Instead of distraction, mindfulness helps us to turn to whatever experience there is, thereby becoming and staying aware of it, but without becoming identified and overwhelmed by it. Non-judgmental, accepting awareness seems to be particularly suited to sooth our moods while being in good contact with all there is in the present moment. Evidence from modern brain imaging suggests that these beneficial effects of mindfulness, like reduction of negative emotion and improved physical and psychological health outcomes, might be particularly due to the non-judgmental, descriptive attitude towards human experience. Lieberman et al. [44] showed that descriptive labeling of a visually presented affective stimulus effectively disrupted affective processing as evidenced by neural activity in the amygdala, a crucial part of the limbic system involved in coding negative affect. This reduction in affective amygdala activity was accompanied by enhanced activation in a prefrontal region involved in executive control over this affective brain response. Most interestingly, this fronto-limbic interplay during affective labeling turned out to be most pronounced for participants with a high level of dispositional mindfulness [45].

In sum, MBSR practice offers a great number of health benefits for BC patients ranging from enhanced coping skills and various quality of life improvements to reductions in psychopathological symptomatology including anxiety and depression. Given that psychopathologies like depression or anxiety disorders have been indirectly associated with increased overall morbidity and mortality [46, 47], it might be reasonable to speculate that MBSR practice may also be beneficial in the course of BC. Considering the central focus of this review, i.e., paying sensitive attention to bodily changes, compliance to follow-up care, and lifestyle issues, MBSR practice indeed turns out to be of particular importance.

Conclusion

The present review was aimed at elucidating the role of mindfulness in follow-up care after breast cancer for the prevention of disease recurrence. In view of the reported evidence, it is clear that several behavioral factors related to one's lifestyle such as physical activity, diet, BMI, smoking, and alcohol consumption have an impact on the risk of BC recurrence. A change in lifestyle after BC diagnosis can thus have a powerful impact on prognosis. However, many patients do not implement healthier habits after diagnosis. Therefore, motivational aspects should be addressed more thoroughly, for instance, by optimizing the provision of information about health-related behaviors and by promoting the utilization of follow-up care measures and psycho-oncological counselling (e.g., motivational interviewing). Awareness about the impact of behavior on one's health is fundamental to changing health-related behavioral patterns. Furthermore, psychosocial distress like anxiety and depression as well as substance abuse should be diagnosed at an early stage and treated adequately. Heightened awareness of possible health risks and bodily sensations might lead to increased worrisome self-observation and exaggerated health behavior that by itself might have a detrimental effect on coping with the disease, quality of life, and follow-up care compliance. MBSR might be a valuable tool for creating a reasonable balance that allows for a prudent awareness of risks and bodily sensations as well as a good compliance with respect to follow-up care without excessive worry and social withdrawal, thereby enhancing physical and psychological well-being.

Disclosure Statement

The authors declare no conflict of interest.

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