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Changes in Body Image in Women with Early Stage Breast Cancer

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1. Introduction

Worldwide, breast cancer is the predominant form of malignancy in women (Hortobagyi *et al.*, 2005). However, when diagnosed in an early stage, women have a good chance to survive for a longer period of time. Therefore, it is important to focus on the impact of breast cancer and its treatment on long-term psychosocial outcomes. In recent years, quality of life (QOL) has become a primary endpoint in oncology (Movsas, 2003, Sprangers, 2002). Body image is an important aspect of QOL, especially in breast cancer patients (Avis *et al.*, 2005), because of the mutilating effect surgical treatment may have. Body image is a component of the self-concept of a woman, which includes feeling attractive and feminine (Fobair *et al.*, 2006). Body image is defined in different ways, but typically conceived as a multidimensional construct, consisting of perceptual, attitudinal, and behavioral aspects.(Jolly *et al.*, , Sarwer and Cash, 2008) Body image evaluation (e.g., satisfaction or dissatisfaction) and body image investment (i.e., the psychological importance of one's appearance to his or her sense of self or self-worth) are the most central body image dimensions.(Sarwer and Cash, 2008) Patients experience a body image problem when a marked discrepancy exists between the actual or perceived appearance or function of a discrete bodily attribute(s) and an individual's expressed ideal regarding this bodily attribute(s).(White, 2000) A positive body image is related to patients' ability to cope with cancer (Pikler and Winterowd, 2003). In this study, the focus will be on the dimension of body image evaluation.

Women with breast cancer often experience a decrease in satisfaction with body image after surgery, irrespective of type of surgical treatment (Brandberg *et al.*, 2008, Ganz *et al.*, 1992, Kraus, 1999, Lindop and Cannon, 2001). There is no consensus whether the type of surgery received is related to dissatisfaction with body image after surgery. Some studies found that women receiving MTC report lower scores on body image compared with women receiving BCT (Anagnostopoulos and Myrgianni, 2009, Engel *et al.*, 2004, Ganz *et al.*, 1992, Janni *et al.*, 2001, Janz *et al.*, 2005, Kenny *et al.*, 2000, Schou *et al.*, 2005). However, a number of studies did not find type of surgery to be a relevant factor in satisfaction with body image (Fobair *et al.*, 2006, Goldberg *et al.*, 1992, Schover *et al.*, 1995, Wolberg *et al.*, 1989). Furthermore, previous research was also inconsistent regarding adjuvant therapy. Although most studies

showed that chemotherapy (Fehlauer *et al.*, 2005, Joly *et al.*, 2000), hormone therapy (Ganz *et al.*, 1998), and radiotherapy (Fehlauer *et al.*, 2005, Hopwood *et al.*) did not negatively affect body image, Schover et al. (Schover *et al.*, 1995) concluded that chemotherapy did have a negative impact on body image, while hormonal and radiation therapy did not.

Women's perception about their bodies may be influenced by the length of time since treatment. In general, most studies found that body image improved over time (Hopwood *et al.*), for MTC and BCT (Ganz *et al.*, 1992, King *et al.*, 2000). However, in a more recent study, it was found that most body image scores were quite stable, especially for MTC patients. Only BCT patients felt more attractive and feminine after two years (Engel *et al.*, 2004). Information about the effect of surgery across time is lacking and few studies measured body image before diagnosis making it impossible to know the effect of treatment on patients' body image. Therefore, the first aim of this prospective follow-up study was to examine changes in body image across one year, starting before diagnosis and comparing women with benign breast problems (BBP group) with women with breast cancer (MTC and BCT).

The impact of disease and treatment on general QOL seems to vary with age, marital status, and educational level, with younger women and women with lower levels of education reporting lower QOL scores when patients received chemotherapy (Janz *et al.*, 2005, King *et al.*, 2000). Two studies reported a strong relationship between age and body image (Al-Ghazal *et al.*, 1999, King *et al.*, 2000, Yeo *et al.*, 2004). The largest negative impact of MTC on body image was found amongst young, married women (King *et al.*, 2000, Yeo *et al.*, 2004). In contrast, other studies did not find differences in scores on body image between younger and older women (Engel *et al.*, 2004, Hartl *et al.*, , Kenny *et al.*, 2000, Zimmermann *et al.*, 2009).

Body image is not only influenced by life events such as having breast cancer, but also by culture, socio-economic status, and personality (Diener *et al.*, 2003). The personality traits extraversion (the disposition towards cheerfulness, sociability, and high activity) and neuroticism (the tendency to experience distressing emotions, such as fear, guilt, and frustration) may have an effect on QOL (Diener *et al.*, 2003). Only one study examined these characteristics and found that neuroticism was acting as a vulnerability factor for anxiety and/or depressive symptoms one year after breast cancer surgery (Millar *et al.*, 2005). Besides, Costa et al. (Costa *et al.*, 1992) found that neuroticism was correlated with a negative body image and extraversion was correlated with a positive body image. However, there is a lack of prospective data on possible relationships between psychological, clinical, and demographic factors and body image (Hartl *et al.*, 2003, Zimmermann *et al.*, 2009). Therefore, the second aim of this prospective study was to examine the effects of personality, sociodemographic factors, and type of surgery on body image in breast cancer patients at different time points after treatment over a one-year period. In contrast with previous studies on satisfaction with body image in breast cancer patients, this study examined which factors from a combination of factors (age, marital status, educational level, work status, disease stage, type of surgery, chemotherapy, radiotherapy, hormone therapy, neuroticism, extraversion, agreeableness, openness to experiences, conscientiousness) predicted body image. It is hypothesized that body image problems arise from surgery and are most commonly experienced following MTC. In addition, body image problems are a function of personality (i.e., neuroticism).

2. Methods

2.1 Participants

Women with a palpable lump in the breast or an abnormality on a screening mammography were referred by their general practitioner to the outpatient clinic of the St. Elisabeth Hospital (Tilburg), the Maasland Hospital (Sittard; since August 2004), or the Jeroen Bosch Hospital (Den Bosch; since January 2006) in the Netherlands between September 2002 and September 2007. Women were included if they had an abnormality in the breast, were able to read, speak and write Dutch, and were 18 years or older. Women who had a history of abnormalities in the breast, benign or malignant, or had a breast tumor that was too large (>5 centimeter) for BCT, were excluded from the study. After written informed consent and before the first appointment with the surgeon, the participating women completed a set of questionnaires. Thus, women completed the first set of questionnaires when the diagnosis was still unknown. After this baseline measurement (Time-1), a set of questionnaires was also completed one (Time-2), three (Time-3), six (Time-4), and 12 months (Time-5) after diagnosis (BBP) and/or surgical treatment (BC). The breast cancer group consisted of 219 patients; the women with benign breast problems (BBP group) consisted of 381 patients (See Figure 1). Non-participants (57.8 ± 10.1 yrs) were older than participants (55.0 ± 10.4 yrs; p=.001) in the study. They did not differ on other sociodemographic (i.e., living with a partner, having children, educational level) or clinical characteristics (i.e., disease stage, type of surgery, adjuvant therapy). The length of the questionnaires and the amount of stress the women experienced during the diagnostic period were the reasons for not participating in the study. This study was approved by the local ethics committee.

2.2 Questionnaires

All women completed questionnaires on personality factors (only at baseline) and the WHOQOL-100 Body Image and Appearance facet (all time points). The BC group also completed the EORTC-QLQ-BR23 Body image subscale from Time-2 onwards. Both instruments were chosen since both subscales complement each other, i.e., the Body and Appearance facet covers more general concerns (satisfaction with they way the body looks, acceptance of bodily appearance, and inhibition by own looks), while the Body image subscale covers feelings of low attractiveness and femininity as a result of cancer or treatment.

The Neuroticism-Extraversion-Openness Five Factor Inventory (NEO-FFI) (Costa and McCrae, 1992, Hoekstra *et al.*, 1996) was developed to study an individual's personality by testing the five domains of the Five Factor or Big Five Model: neuroticism (i.e., the tendency to experience distressing emotions, such as fear, guilt, and frustration), extraversion (i.e., the disposition towards cheerfulness, sociability, and high activity), openness (i.e., the tendency to have a receptive orientation towards varied experiences and ideas), agreeableness (i.e., the inclination towards interpersonal trust and consideration of others) and conscientiousness (i.e., the tendency towards persistence, sense of duty, organizing, planning, and self-discipline). This self-report questionnaire consists of 60 statements. Each statement is rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), resulting in dimension scores ranging from 12 to 60. The psychometric properties are acceptable to good.(Costa and McCrae, 1992)

The World Health Organization Quality of Life assessment instrument-100 (WHOQOL-100) (De Vries and Van Heck, 1997, WHOQOL Group, 1998) is a cross-culturally developed generic multi-dimensional quality of life measure. This questionnaire consists of 100 items

that are divided in 24 facets covering four domains (Physical health, Psychological health, Social Relationships, and Environment) and an Overall Quality of Life and General Health facet. Each facet is measured with four items using 5-point Likert scales. In the present study, only the facet Body Image and Appearance was used. The facet body image consists of four items, for instance 'Are you able to accept your bodily appearance?' A high facet score indicates good body image (score range: 4 - 20). The reliability and validity are adequate and sensitivity is high. (De Vries and Van Heck, 1997, Den Oudsten *et al.*, 2009b, O'Carroll *et al.*, 2000) The Cronbach's alpha coefficients of the facet Body Image and Appearance in this study were .85 (BCT group), .87 (BBP group), and .88 (MTC group).

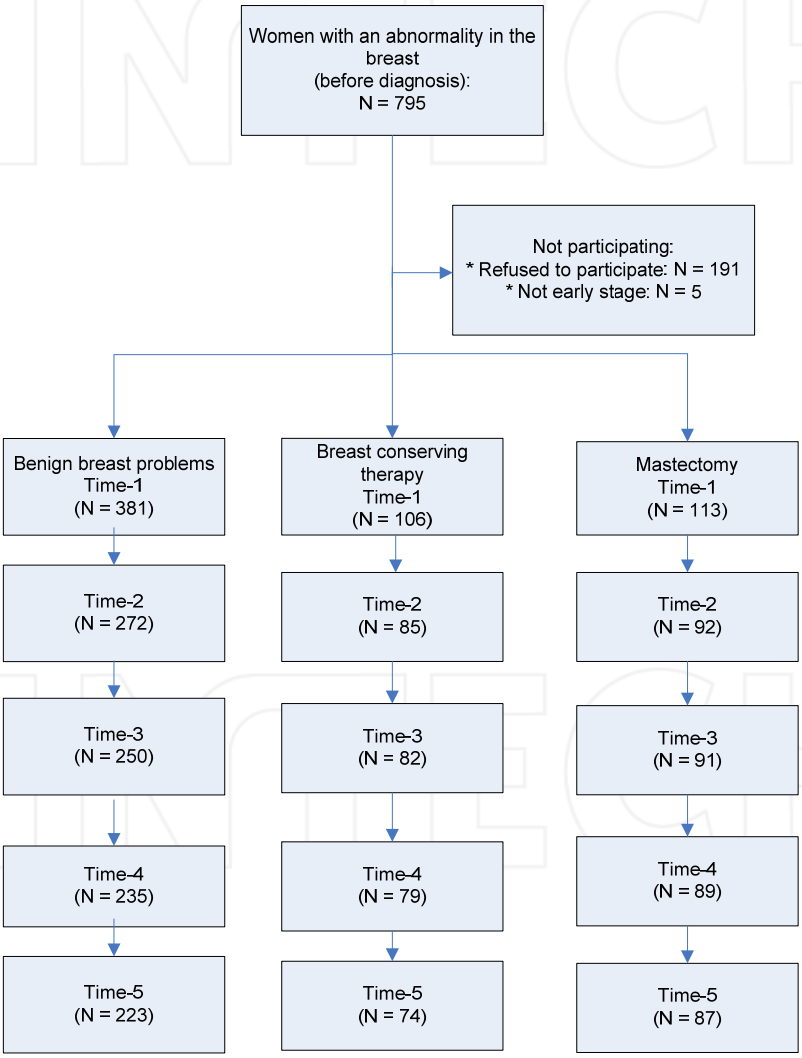

Fig. 1. Flow chart

The EORTC QLQ-BR23 is a 23-item disease-specific questionnaire measuring health status in breast cancer patients. The BR-23 is a supplementary module of the EORTC QLQ C30, which covers the physical, personal, cognitive, emotional, and social domains.(Montazeri *et al.*, 2000, Sprangers *et al.*, 1996) The EORTC QLQ BR-23 incorporates two functional scales (Body Image and Sexual Functioning) and three symptom scales (Arm Symptoms, Breast Symptoms, and Systematic Therapy Side Effects). The remaining items assess sexual enjoyment and being upset by hair loss. The reliability and validity are adequate(Montazeri *et al.*, 2000, Sprangers *et al.*, 1996, Yun *et al.*, 2004). In this study, only the scale Body Image was used. The Body Image scale consists of four items, for instance 'Did you feel less feminine as a consequence of your illness or treatment?' This scale was linearly transformed (score range 0-100). A higher score represent higher levels of functioning. The reliability and validity of this scale is adequate.(Sprangers *et al.*, 1996, Yun *et al.*, 2004) The Cronbach's alpha coefficients of the Body Image scale in this study were .87 (BCT group) and .89 (MTC group).

Patients were asked to respond to a number of questions concerning age, marital status, having children, and years of education. Marital status was dichotomized in two categories, i.e. being involved in a relationship or not being involved in a relationship.

Data concerning diagnosis, type of surgical treatment (BCT or MTC), disease stage, and type of adjuvant treatment (chemotherapy, hormone therapy, and radiotherapy) were obtained from the medical records of the included patients.

2.3 Statistical procedures

Student t-tests and chi-square tests were used to examine differences between participants and non-participants and women who had undergone BCT and MTC. General linear model for repeated measures was used to examine if scores on Body Image changed over time, if scores on Body Image were different for (women with a benign diagnosis,) women who undergone BCT or MTC, and if the pattern of Body Image scores over time was different for BCT and MTC. Subsequently, multivariate analysis of covariance (MANCOVA) with repeated measures was performed to adjust for the effect of potential confounders on the relationship between body image and group (benign breast problems, MTC, BCT). Radiotherapy and disease stage were selected as covariates based on statistical differences between treatment groups on baseline characteristics. Post-hoc paired samples t-tests were conducted to determine differences in body image for group separately. Linear regression analyses were performed to examine which, and to what extent, sociodemographic, clinical, and personality variables predicted the scores on body image (WHOQOL-100, EORTC QLQ-BR23). For the time points, one, three, six, and 12 months after surgery, a hierarchical multiple regression analysis (method: enter) was conducted. As a first step, aiming at minimizing the number of independent variables in the final regression analysis, separate preliminary regression analyses were performed with sociodemographic (age, marital status, educational level, work status), clinical (disease stage, type of surgery, chemotherapy, radiotherapy, and hormone therapy), psychological (body image at baseline), and personality factors (neuroticism, extraversion, agreeableness, openness to experiences, conscientiousness) as independent variables. Subsequently, significant predictors ($p<.05$) were entered in the final regression analysis. Chemotherapy, radiotherapy, and hormone therapy were not entered at Time-2 as a factor, since women with breast cancer did not yet received adjuvant therapy at that time. Mean and standard deviations are provided as ($M \pm SD$). SPSS 17.0 was used for all calculations.

3. Results

The sociodemographic, clinical, and psychological characteristics of women who received BCT or MTC and the women who had a benign breast problem are summarized in Table 1.

	BBP (n = 381)	BCT (n = 106)	MTC (n = 113)	p-value
Demographics				
Age at diagnosis, yrs	52.9 ± 10.4	58.4 ± 8.5	58.5 ± 9.7	.91
No partner	50 (13.1%)	14 (13.2%)	21 (18.6%)	.29
No children	57 (14.9%	14 (13.2%)	14 (12.4%)	.77
Educational level				
0-9 years	123 (32.1%)	38 (35.8%)	43 (38.1%)	.84
10-14 years	171 (44.6%)	46 (43.4%)	47 (41.6%)	
> 14 years	72 (18.8%)	19 (17.9%)	17 (15.0%)	
Clinical values				
Disease stage	-			
Stage 0		8 (7.5%)	17 (15.5%)	<.0001
Stage I		60 (56.6%)	32 (28.3%)	
Stage IIa		33 (31.1%)	34 (30.1%)	
Stage IIb		5 (4.7%)	30 (26.5%)	
Adjuvant therapy[1]				
Chemotherapy	-	20 (18.9%)	41 (36.3%)	.01
Radiotherapy	-	96 (90.6%)	20 (17.7%)	<.0001
Hormone therapy	-	32 (30.2%)	52 (46.0%)	.02
Psychological				
Body image WHOQOL[2] [range: 4-20]	16.0 ± 3.3	16.6 ± 2.8	16.5 ± 3.1	.81
Neuroticism [range: 12-60]	31.1 ± 6.9	30.7 ± 7.5	29.4 ± 7.1	.23
Extraversion [range: 12-60]	40.1 ± 5.8	40.6 ± 5.7	41.9 ± 5.4	.09
Openess to experience [range: 12-60]	36.7 ± 5.4	36.2 ± 6.6	35.0 ± 4.9	.20
Agreeableness [range: 12-60]	43.7 ± 4.2	43.7 ± 4.2	43.3 ± 4.2	.44
Conscientiousness [range: 12-60]	45.4 ± 4.9	45.9 ± 5.6	45.9 ± 5.2	.96

Note: [1] more than one treatment possible; [2] higher scores on body image indicate higher quality of life
Abbreviations: BBP: Benign Breast Problems; BCT: Breast-Conserving Therapy; MTC = mastectomy

Table 1. Patient characteristics

Patients who underwent MTC were more often treated with chemotherapy and hormone therapy, compared to patients who received BCT (p <.05). As expected, based on standard treatment, women with BCT were more often treated with radiotherapy (p<.0001) and differed regarding disease stage (p<.0001). No other differences between the surgical groups were found with regard to other sociodemographic, clinical, and psychological variables.
Figure 2 shows the change in scores on WHOQOL-facet Body Image. Body Image changed significantly over time [F(4,239) = 3.0; p =.020], after correcting for potential confounders. Furthermore, an interaction effect was found for time by surgical treatment, indicating that the pattern of change over time in Body Image is different for women with MTC, women with BCT, and women with BBP [F(8,480) = 2.8; p =.004]. From Time-1 to Time-2, women with MTC reported a significant deterioration in their Body Image (p=.035), while women with BCT and BBP were stable. Although their Body Image improved in time, they had significantly lower scores at Time-5 when compared to Time-1 (p = .004). Radiotherapy and disease stage did not interact with Body Image (p >.05). Overall, women with BBP and women with BCT and MTC did not score differently on Body Image, except at Time-2 (p<.036).

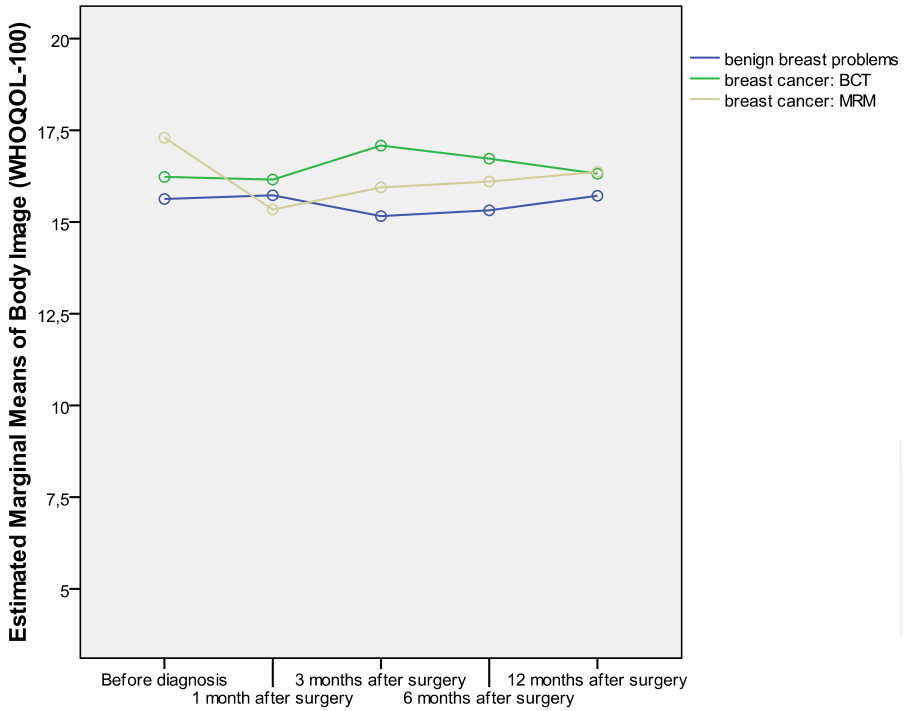

Fig. 2. Mean scores on Body Image and Appearance (WHOQOL-100) across time for women who undergonebreast-conserving therapy (BCT) and mastectomy (MTC) and women with a benign diagnosis

Figure 3 shows the change in scores on EORTC QLQ BR-23 subscale Body Image. In the adjusted analysis, Body Image improved significantly over time when correcting for potential confounders [F(3,93) = 2.8; p =.043]. Scores on Time-4 (85.2 ± 20.3), and Time-5 (86.4 ± 18.4) were statistically higher compared with the scores on Time-2 (79.7 ± 23.1; ps<.05). On average, women with BCT and MTC scored differently on Body Image, i.e. women with BCT scored significantly higher on Body Image [F(1,95) = 7.4; p =.008]. However, no interaction effect was found, indicating that the pattern of change over time in Body Image was not significantly different for both groups (p =.348). Radiotherapy and disease stage did not interact with Body Image (p >.05).

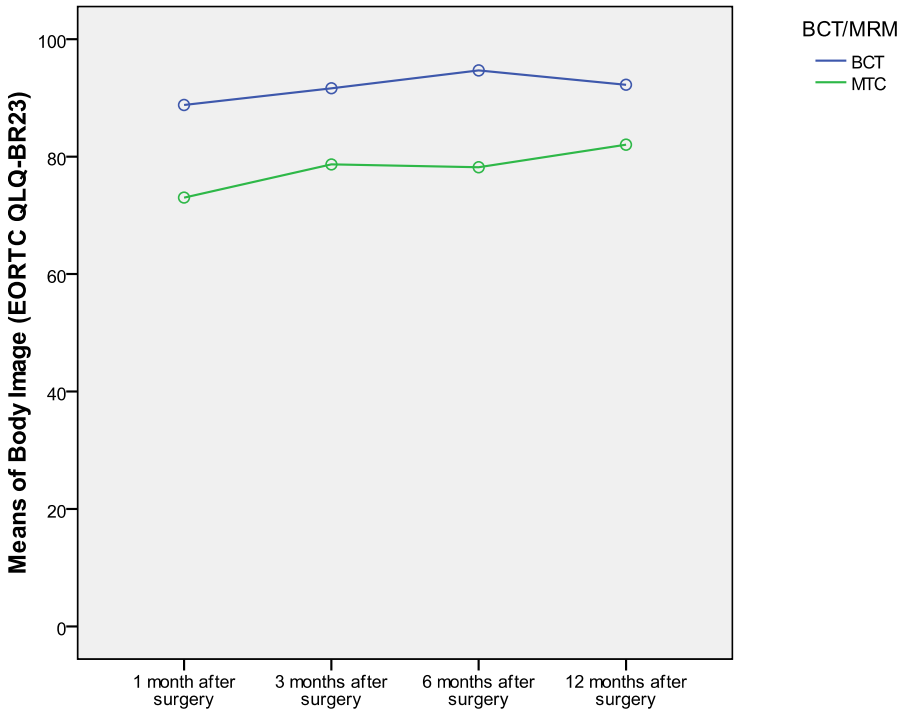

Fig. 3. Mean scores on Body Image (EORTC QLQ-BR23) across time for women who undergone breastconserving therapy (BCT) and mastectomy (MTC)

Table 2 shows those factors associated with Body Image (WHOQOL-100) scores across time. Being older, receiving chemotherapy, high scores on neuroticism, and low scores on agreeableness were significantly associated with lower Body Image scores at all time points. The regression models at different time points explained 26% to 32% of the variance. Table 3 shows those factors associated with Body Image (EORTC QLQ BR23) scores across time. High scores on neuroticism were significantly associated with lower Body Image scores at all time points. The regression models at different time points explained 16% to 30% of the variance. Chemotherapy, radiotherapy, and hormone therapy were not entered in the regression analysis at Time-2 and Time-3, since women not received this treatment yet.

Timepoint	Factor	β-value	R^2	Adjusted R^2	p-value
Time-2*	Age	.31	.34	.32	<.0001
	BCT/MTC	-.21			.005
	Neuroticism	-.31			<.0001
	Agreeableness	.20			.011
Time-3*	Age	.35	.27	.26	<.0001
	Disease stage	-.25			.001
	Neuroticism	-.29			<.0001
Time-4	Age	.18	.29	.26	.024
	Educational level	.08			.328
	Chemotherapy	-.28			.001
	Neuroticism	-.23			.006
	Agreeableness	.24			.003
Time-5	Age	.22	.30	.28	.006
	Chemotherapy	-.16			.038
	Neuroticism	-.30			<.0001
	Agreeableness	.26			.001

Note: *chemotherapy was not entered at Time-2 and Time-3 as a factor, since women with breast cancer had not yet received chemotherapy

Table 2. Final results of hierarchical multiple regression analysis with body image (WHOQOL-100) as the dependent variable, for one (Time-2), three (Time-3), six (Time-4), and 12 months after surgery (Time-5)

4. Discussion

Body image is an important aspect of QOL in women with breast cancer. For years, it was hypothesized that MTC contributed to some extent to the development of psychological problems of women with breast cancer. It was intuitively thought that BCT would remove some of the stress because of its less mutilating effect compared to MTC.(Meyer and Aspegren, 1989) Until now, body image was mostly studied in cross-sectional designs. Therefore, this prospective study examined the impact of surgical treatment, personality, and sociodemographic factors on body image during a follow-up period of one year after primary surgical treatment. In addition, this study examined if scores on body image were lower in women who received MTC compared to women who underwent BCT or women with benign breast problems. In general, a temporary decrease was found in body image scores due to treatment. Although we found that scores of women with MTC were lower

compared with women with benign breast problems and women with BCT, the results were only significant at one month after surgery. Type of surgical treatment predicted body image at one month (WHOQOL-100; EORTC QLQ-BR23), three months (EORTC QLQ-BR23), and six months after surgical treatment (EORTC QLQ-BR23). Most studies found BCT to be superior with regard to scores on body image, which is in line with our study. (Avis *et al.*, 2004, Ganz *et al.*, 2002, Hartl *et al.*, 2003, King *et al.*, 2000, Schou *et al.*, 2005, Yeo *et al.*, 2004) BCT patients were more satisfied with their appearance than patients who received MTC. (Engel *et al.*, 2004, Janni *et al.*, 2001)

Timepoint	Factor	β-value	R^2	Adjusted R^2	p-value
Time-2*	BCT/MTC	-.29	.18	.16	.001
	Neuroticism	-.24			.008
	Agreeableness	.16			.079
Time-3*	Age	.26	.33	.31	<.0001
	BCT/MTC	-.30			<.0001
	Neuroticism	-.43			<.0001
	Conscientiousness	-.29			<.0001
Time-4	Age	.28	.34	.30	.001
	Educational level	.07			.400
	BCT/MTC	-.21			.007
	Chemotherapy	-.16			.044
	Neuroticism	-.32			<.0001
	Agreeableness	.19			.024
	Conscientiousness	-.22			.007
Time-5	Age	.22	.23	.20	.006
	Neuroticism	-.25			.004
	Agreeableness	.27			.002
	Conscientiousness	-.29			.001

Note: *chemotherapy was not entered at Time-2 and Time-3 as a factor, since women with breast cancer had not yet received chemotherapy

Table 3. Final results of hierarchical multiple regression analysis with body image (EORTC-QLQ BR23) as the dependent variable, for one (Time-2), three (Time-3), six (Time-4), and 12 months after surgery (Time-5)

Studies in this field show a wide variation with regard to the methodological aspects. First, different instruments were used to assess body image. There is a wide variation in body image scales, and they are composed of different items. For example, some instruments contain items assessing satisfaction with body image, as the breast specific module from the European Organization for Research and Treatment of Cancer (EORTC QLQ-BR23)(Fehlauer et al., 2005, Janz et al., 2005), or with the Cancer Rehabilitation Evaluation System (CARES). (Avis et al., 2004, Ganz et al., 1992) Others constructed their own scale or

added questions to general questionnaires to measure body image.(Engel et al., 2004, Hartl et al., 2003, Janni et al., 2001, King et al., 2000) In this study, a generic QOL instrument (WHOQOL-100) and a disease-specific health status instrument (EORTC QLQ BR-23) were used. The results based on both instruments indicated that body image scores changed significantly over time, irrespective of diagnosis/treatment. However, this effect was partly explained by the differences in scores between the baseline measure and the first follow-up measure (WHOQOL-100), when body image scores dropped considerably in the MTC group. Body image scores measured with the EORTC-QLQ BR23 also improved significantly; but, this measure could not register the drop in body image scores between Time-1 and Time-2, since it can only be assessed in a cancer population. In our study, the baseline assessment was before diagnosis. (Engel et al., 2004) Our findings are in line with other studies. For instance, Ganz et al. (Ganz et al., 1992) reported an improvement in body image one year after surgery in both surgical groups, just as Bloom et al. (Bloom et al., 2004) did between baseline (soon after diagnosis) and five year follow-up. In our study, body image scores completely returned to baseline values, except for the body image scores of women with MTC. It is possible that a study in which a longer follow-up is taken, body image will further improve.

Older women were more satisfied with their bodies, which is in line with the majority of other studies in this field. (Al-Ghazal *et al.*, 1999, Fehlauer *et al.*, 2005, Janz *et al.*, 2005, Kenny *et al.*, 2000, King *et al.*, 2000) However, it should be noted that the results on the direction of the relationship between age and body image in the literature is inconsistent. That is, several studies did not find differences in body image scores between age groups(Engel *et al.*, 2004, Schou *et al.*, 2005) or found that body image issues may be particularly salient for younger women(Avis *et al.*, 2005). Since older women are often excluded from clinical studies, future studies should examine the psychosocial concerns in this age group.

Adjuvant therapies, like radiotherapy and hormone therapy were not strongly related to body image. Chemotherapy predicted scores on body image at all time points included. From the few studies that are available on this topic, women who received chemotherapy reported lower scores on body image (Janz *et al.*, 2005, Schover *et al.*, 1995), probably due to the loss of hair that is accompanied by this type of treatment.

Personality characteristics (neuroticism and agreeableness) played an important role in predicting outcome in this study. Neuroticism contributed in a negative way to scores on body image at all follow-up measures, after controlling for all other variables. This result is consistent with other research on personality in breast cancer, in which patients, who experienced high levels of chronic stress one year after treatment for breast cancer, were characterized by higher levels of neuroticism. (Millar *et al.*, 2005) In other studies, this trait also in part explained the variance in depressive symptoms after breast cancer surgery (Den Oudsten *et al.*, 2009a, Golden-Kreutz and Andersen, 2004), as well as of poor adjustment to mastectomy. (Morris *et al.*, 1977)

After discussing the results of the study, certain limitations and strengths should be acknowledged. Strength of the underlying study is the baseline measurement, before the diagnosis is known. At the same time, this is also a weakness, because women are probably scared and nervous because an abnormality has been seen on the mammography (i.e., only applies for those women who had a screening mammography) or that a lump (whether it is benign or malign) is in the breast. However, in this study the BBP group showed stable scores regarding body image. The optimal moment for the baseline measurement would be

before visiting the doctor or taking a mammography, and then it is probably of better prospective value. The one-year follow-up period is another advantage of this study, because body image is a concept that probably changes over time when a woman is confronted with a threat to her body image. Moreover, this study included also a control group consisting of women with benign breast problems. Few studies have included a comparison group. (Andrykowski *et al.*, 1996) Finally, the data was collected in several hospitals in the Netherlands, which may facilitation generalization in women with breast cancer. Studies, like the current one, often show relatively high attrition(Arving *et al.*, 2008). Our study had 73.5% of the women with early stage BC in the study at one-year after surgical treatment. This may have influenced our results. However, women with breast cancer who dropped out of the study did not differ from women remaining in the study, except for age with women staying in the study being significantly younger. A limitation of this study is that a specific body image scale would have been appropriate, for instance Body Image Scale(Hopwood *et al.*, 2001). In addition to the EORTC QLQ BR23 items on body image, this scale includes also items on change in self-consciousness with appearance, less sexually attractive, less feminine, dissatisfaction with appearance when dressed, dissatisfaction with scars, body feeling less whole, and avoidance of people because of appearance. These topics were not assessed in our study. However, it should be noted that the women with BBP could not have been assessed on body image.

More longitudinal studies need to focus on body image, whether body image in the MTC group will eventually return to baseline values (i.e., before the breast cancer diagnosis), but also examine the associations with self-esteem, sexual functioning, and quality of life. In addition, studies should also include elderly women. Moreover, it is also reasonable to take women's partners into account, since patients and partners coping with cancer will exchange experiences and influencing each others acceptation process. (Manne and Badr, 2008, 2009) Recently, Zimmerman et al. (Zimmermann *et al.*, 2009) have shown that dyadic factors are important. They found that women's depressive symptoms, women's age and men's marital satisfaction predicted women's body image, explaining 24% of the variance. Given the importance of the marital relationship in adaptation, a greater understanding of this dyadic process may aid in the development of psychosocial interventions for couples adapting to breast cancer who may be at risk for distress.

5. Conclusion

In conclusion, results from this study confirm previous findings that breast cancer temporarily affects satisfaction with body image in a negative way. Results are more obvious for women who underwent MTC, than for women who have had BCT. Older women seemed to have more problems with body image after surgery. Overall, it is important for women facing breast cancer to get assistance in adjusting to alterations in body image. (Kraus, 1999) Personality factors that influence these changes should be taken into account.

6. References

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Cancer is now the leading cause of death in the world. In the U.S., one in two men and one in three women will be diagnosed with a non-skin cancer in their lifetime. Cancer patients are living longer than ever before. For instance, when detected early, the five-year survival for breast cancer is 98%, and it is about 84% in patients with regional disease. However, the diagnosis and treatment of cancer is very distressing. Cancer patients frequently suffer from pain, disfigurement, depression, fatigue, physical dysfunctions, frequent visits to doctors and hospitals, multiple tests and procedures with the possibility of treatment complications, and the financial impact of the diagnosis on their life. This book presents a number of ways that can help cancer patients to look, feel and become healthier, take care of specific symptoms such as hair loss, arm swelling, and shortness of breath, and improve their intimacy, sexuality, and fertility.

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