

## RESEARCH ARTICLE

# Association between Socioeconomic Status and Altered Appearance Distress, Body Image, and Quality of Life Among Breast Cancer Patients

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### Abstract

**Background:** Breast cancer patients experience a variety of altered appearance - such as loss or disfigurement of breasts, discolored skin, and hair loss - which result in psychological distress that affect their quality of life. This study aims to evaluate the impact of socioeconomic status on the altered appearance distress, body image, and quality of life among Korean breast cancer patients. **Materials and Methods:** A cross-sectional survey was conducted at advocacy events held at 16 different hospitals in Korea. Subjects were eligible to participate if they were 18 years of age or older, had a histologically confirmed diagnosis of breast cancer, had no evidence of recurrence or metastasis, and had no psychological problems at the time of the survey. Employment status, marital status, education, and income were assessed for patient socioeconomic status. Altered appearance distress was measured using the NCI's cancer treatment side effects scale; body image and quality of life were measured by the EORTC QLC-C30 and BR23. Means and standard deviations of each outcome were compared by socioeconomic status and multivariate linear regression models for evaluating the association between socioeconomic status and altered appearance distress, body image, and quality of life. **Results:** A total of 126 breast cancer patients participated in the study; the mean age of participants was 47.7 (SD=8.4). Of the total, 83.2% were married, 85.6% received more than high school education, 35.2% were employed, and 41% had more than \$3000 in monthly household income. About 46% had mastectomy, and over 30% were receiving either chemotherapy or radiation therapy at the time of the survey. With fully adjusted models, the employed patients had significantly higher altered appearance distress (1.80 vs 1.48;  $p<0.05$ ) and poorer body image (36.63 vs 51.69;  $p<0.05$ ) compared to the patients who were unemployed. Higher education (10.58, standard error (SE)=7.63) and family income (12.88, SE=5.08) was positively associated with better body image after adjusting for age, disease stage at diagnosis, current treatment status, and breast surgery type. Similarly, patients who were married and who had higher education had better quality of life were statistically significant in the multivariate models. **Conclusions:** Socioeconomic status is significantly associated with altered appearance distress, body image, and quality of life in Korean women with breast cancer. Patients who suffer from altered appearance distress or lower body image are much more likely to experience psychosocial, physical, and functional problems than women who do not, therefore health care providers should be aware of the changes and distresses that these breast cancer patients go through and provide specific information and psychosocial support to socioeconomically more vulnerable patients.

**Keywords:** Breast cancer - socioeconomic status - altered appearance distress - body image

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### Introduction

Women with breast cancer experience a variety of side effects that alter their physical appearance: loss or disfigurement of breasts, discolored skin, alopecia, weight loss or gain, arm swelling (Harcourt, 2005; Frith et al., 2007; Moorey, 2007). Although patients try to take these

changes for granted for treating the disease, they often face feelings of unattractiveness, depression, loss of self-confidence, and impaired body image (Lemieux et al., 2008; Preston, 2010; Abu-Helalah et al., 2014).

According to the recent Korean qualitative study, alteration in appearance is a traumatizing and distressing experience (Kim et al., 2012a) which affect patients' daily

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living, social activities, relationships, and quality of life (Rosenberg et al., 2013).

While altered appearance results in substantial distress in breast cancer patients, there were limited studies regarding factors associated with it. Current research primarily focused on either clinical or demographic factors such as age, stage of breast cancer, treatment types, and length of survivorship (King et al., 2000b); Kim et al., 2012; Rosenberg et al., 2013). Researchers found that patients with mastectomy had worse body image compared to those who received breast-conserving surgery (King et al., 2000; Janz et al., 2005; Fobair et al., 2006). Patients who had additional treatment such as chemotherapy or radiation therapy had worse body image and elevated depression compared to patients who received surgery only (Schover et al., 1995). Young and short-term breast cancer survivors had more distress due to altered appearance; its impact on their quality life was more profound compared to older and long-term breast cancer survivors (King et al., 2000).

Socioeconomic determinants of health have been discussed in the literature, and the need to tailor patient care has been widely expressed (Preston, 2010). Studies regarding socioeconomic status and its differing effects on the health of breast cancer survivors have focused primarily on assessing clinical and pathologic characteristics, quality of life, depression, and anxiety (King et al., 2000; Karakoyun-Celik et al., 2010; Schmid-Buchi et al., 2013; Wang et al., 2013). To our knowledge, however, no study has assessed the association of altered appearance distress with socioeconomic status in breast cancer patients. Individuals from varying socioeconomic backgrounds experience different levels of altered appearance distress because they may face different barriers such as lack of resources (information or physical) or lack of social support, which can hinder their ability to manage distress.

Distress, impaired body image, and physical and social impairment are all associated with supportive care needs (Ogden and Lindridge, 2008). Identifying the most vulnerable population among patients receiving breast cancer treatment will enable us to provide better care for breast cancer survivors and inform health professionals to support such patients more effectively. The objective of this study was to examine associations between socioeconomic status (employment status, marital status, education, and income) and altered appearance distress due to breast cancer treatment. More specifically, this study aimed to identify the socioeconomically vulnerable population of breast cancer patients who would suffer from higher altered appearance distress, lower body image, and lower quality of life.

## Materials and Methods

### Study participants

Study participants were recruited between May 1 and August 30, 2009, at breast cancer advocacy events held at 16 different hospitals in Korea. The events were aimed at teaching breast cancer patients make-up skills and know-how for looking good with altered appearance due

to cancer and its treatment, helping them to restore their self-confidence. Anyone could participate in the events and they were free of charge. Details of the study design and recruitment are described elsewhere (Cho et al., 2014; Choi et al., 2014).

Subjects were eligible to participate if they were 18 years of age or older, had a histologically confirmed diagnosis of breast cancer (stage I to III), had no evidence of recurrence or metastasis, and had no psychological problems at the time of the survey.

We approached 457 breast cancer survivors; 353 (77.2%) agreed to participate in the study. Among them, women who had a psychological problem (n=10), recurrence of the disease (n=37), or who were stage 4 (n=1) were excluded from the study, resulting in a total of 305 study participants.

To evaluate actual altered appearance-related distress and to minimize recall bias, we used the data of only the 126 patients diagnosed with breast cancer within less than 12 months who would experience altered appearance at the time of survey. This study was approved by the institutional review board (IRB) of the Samsung Medical Center, and all study participants provided written informed consent.

### Measurements

To measure the altered appearance distress due to breast cancer treatments, we used the National Cancer Institute's cancer treatment side effects scale, which was developed to measure distress caused by general alteration in appearance. Patient's choices were 'not at all', 'a little', 'quite a bit', or 'very much'. Each response was assigned a numeric score (not at all=0, a little=1, quite a bit=2, very much=3), where higher scores indicate higher distress. We used the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30) and the breast cancer specific module (BR-23) which has been translated into Korean and validated to assess body image and quality of life of breast cancer patients (Yun et al., 2004). Body image was assessed using the four questions of BR-23 quality of life using two questions for global health status of EORTC QLQ-C30.

For socioeconomic status, we asked the study participants' marital status, educational level, employment status at the time of the survey and monthly family income. We also reviewed the medical records to obtain information about date of diagnosis, stage of disease, type of surgical procedure received, and adjuvant treatment status.

### Statistical analysis

We scored the body image and quality of life questionnaires according to the EORTC scoring manual (Fayers et al., 2001). We linearly transformed the QLQ-C30 and BR23 data to yield scores from 0 to 100; a higher score represented a better body image and higher quality of life (Fayers et al., 2001). For assessing the impact of socioeconomic status on altered appearance distress, body image, and quality of life, we calculated the mean and standard deviation of each outcome and

compared them by socioeconomic status. We used multivariate linear regression models to analyze the relationships between socioeconomic status and altered appearance distress, body image, and quality of life. In multivariate analysis, we adjusted for variables that could be potential confounders: age, marital status, education, employment status, monthly family income, disease stage at diagnosis, current treatment status, and breast surgery type. All statistical analyses were performed using STATA 12.0. Statistical significance was defined as  $p < 0.05$ .

## Results

### Characteristics of participants

The mean age (Standard Deviation) of the patients was 47.7 (8.1) years; 48.4% of patients were 40-49 years of age. Of the total, 83.2% were married, and 85.6% received more than high school education. In terms of employment status, 35.2% of the patients were working or on leave of absence (employed); 64.8% were unemployed (housewives or retirees). About two-fifths (41%) of the patients had more than a \$3000 monthly household income. There were 31%, 48.4% and 15.9% stage I, II, and III breast cancer patients, respectively. One-third of the participants were receiving either chemotherapy or radiation therapy at the time of the study; 45.8% had mastectomy.

### Altered appearance distress, body image, and quality of life by socioeconomic status

Breast cancer patients with less education suffered from higher altered appearance distress than those with higher education (1.78 vs 1.56), but it was not statistically significant. Patients who were employed had experienced significantly higher altered appearance distress compared to unemployed patients (1.80 vs 1.48;  $p < 0.05$ ). Similar to body image, patients who were employed had worse body image than patients who were not employed (36.63 vs 51.69;  $p < 0.05$ ). In terms of monthly family income, patients who had higher income ( $\geq \$3000$ ) reported better body image than patients with lower income ( $< \$3000$ ) (42.02 vs 53.23;  $p < 0.05$ ), and it was statistically significant. Although quality of life seemed to be affected by all four of the socioeconomic factors, education was the only associated factor that had statistical significance.

Patients with less than middle school education reported much lower quality of life compared to patients with more than high school education (45.10 vs 60.36;  $p < 0.05$ ).

### Factors associated with altered appearance distress, body image, and quality of life

The results of multivariate analysis of factors associated with altered appearance distress, body image, and quality of life are displayed in Table 3. With the adjustment for age, disease stage at diagnosis, current treatment status, and breast surgery type, the socioeconomic status was significantly associated with altered appearance distress, body image, and quality of life. Employed patients had statistically higher altered appearance distress (0.39,

**Table 1. Characteristics of Participants (N = 126)**

Characteristics	N (%)
Age	
Mean (SD*)	47.7 (8.1)
<40	17 (13.5)
40-49	61 (48.4)
50-59	38 (30.2)
$\geq 60$	10 (7.9)
Marital status	
Married	104 (83.2)
Single/divorced/separated or widowed	21 (16.8)
Education	
Middle school or less	18 (14.4)
More than high school	107 (85.6)
Employment status	
Employed (working or leave of absence)	44 (35.2)
Unemployed (housewife or retired)	37 (64.8)
Monthly family income	
Less than \$3000	72 (59.0)
More than \$3000	35 (41.0)
Disease stage at diagnosis	
Stage 1	39 (31.0)
Stage 2	61 (48.4)
Stage 3	20 (15.9)
Unknown	6 (4.8)
Current active treatment**	
Yes	42 (33.3)
No	84 (66.7)
Breast surgery type	
Lumpectomy	64 (54.2)
Mastectomy	54 (45.8)

\*SD=Standard Deviation; \*\*Receiving chemotherapy or radiation

**Table 2. Comparison of Altered Appearance Distress, Body Image, and Quality of Life with Socioeconomic Variables**

Characteristics	AA distress <sup>a</sup> Mean (SE*)	Body image <sup>b</sup> Mean (SE*)	Quality of life <sup>c</sup> Mean (SE*)	
Marital status	Married	1.57 (0.07)	45.79 (2.69)	59.58 (1.89)
	Single/divorced/separated or widowed	1.67 (0.19)	49.21 (4.81)	50.83 (5.16)
Education	Less than middle school	1.78 (0.19)	39.81 (5.62)	45.10 (5.11)**
	More than high school	1.56 (0.07)	47.2 (2.64)	60.36 (1.86)
Employment status	Unemployed (housewife or retired)	1.48 (0.09)**	51.69 (2.89)**	57.16 (2.13)
	Employed (working or leave of absence)	1.80 (0.11)	36.63 (3.75)	60.91 (3.21)
Income	<\$3000	1.51 (0.08)	42.02 (2.92)**	55.64 (2.25)
	>\$3000	1.67 (0.12)	53.23 (3.84)	61.22 (2.94)

\*SE=Standard error; \*\* $p < 0.05$ ; <sup>a</sup>For calculation of the mean, the following 'altered appearance distress' categories were assigned in each of the following values: 'not at all=0, a little=1, quite a bit=2, very much=3'; thus, a higher mean indicates higher distress; <sup>b</sup>EORTC QLQ-C30, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; BR23, breast cancer module: Positive values indicate improvement; <sup>c</sup>EORTC QLQ-C30, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 Function scale (global health status): Positive values indicate improvement

**Table 3. Association between Altered Appearance Distress, Body Image, Quality of life and Socioeconomic and Clinical Characteristics**

Characteristics		AA distress Coef. (SE)	Body image Coef. (SE)	Quality of life Coef. (SE)
Socioeconomic characteristics <sup>†</sup>				
Marital status	Married	Reference	Reference	Reference
	Single/divorced/separated or widowed	0.09 (0.18)	1.94 (6.53)	-9.6 (4.76)*
Education	Less than middle school	Reference	Reference	Reference
	More than high school	-0.21 (0.21)	10.58 (7.63)	17.16 (5.36)**
Employment status	Unemployed (housewife or retired)	Reference	Reference	Reference
	Employed (working or leave of absence)	0.39 (0.15)*	-15.95 (5.27)*	4.43 (3.99)
Income	<\$3000	Reference	Reference	Reference
	>\$3000	0.21 (0.15)	12.88 (5.08)*	5.82 (3.84)
Clinical characteristics <sup>††</sup>				
Disease stage at diagnosis	Stage1	Reference	Reference	Reference
	Stage2	0.25 (0.16)	-5.30 (5.81)	-6.45 (4.20)
	Stage3	-0.14 (0.23)	0.83 (8.00)	6.24 (5.81)
	Unknown	0.52 (0.34)	-7.62 (11.9)	-5.28 (8.58)
Current active treatment	Yes	Reference	Reference	Reference
	No	0.29 (0.16)	-3.87 (5.52)	-5.42 (3.94)
Breast surgery type	Lumpectomy	Reference	Reference	Reference
	Mastectomy	0.17 (0.15)	-10.42 (5.19)*	-5.20 (3.83)

\*p<0.05; \*\*p<0.01; †Adjusted for age, disease stage at diagnosis, current treatment status, and breast surgery type; ††Adjusted for age and other clinical factors excluding the one that is being analyzed

standard error (SE=0.15), and lower body image (15.95, SE=5.27) than the unemployed patients. Patients who had higher monthly family income ( $\geq$ \$3000) were more likely to have better body image by 12.88 ( $\pm$ 5.08) points than patients who had lower income (<\$3000), and it was statistically significant ( $p<0.05$ ). In terms of quality of life, patients living without a partner had poorer quality of life by 9.6 ( $\pm$ 4.76) points than patients living with a partner or married ( $p<0.05$ ). Patients with higher education had better quality of life by 17.16 ( $\pm$ 5.36) points than patients with lower education after adjusting for all other confounders, and it was statistically significant ( $p<0.01$ ). Among demographic and clinical characteristics, surgery type was the only factor associated with body image in a multivariate model. Patients who had mastectomy reported about 10 points lower body image score than patients with lumpectomy ( $p<0.05$ ).

## Discussion

Our research described the impact of socioeconomic characteristics on altered appearance distress, body image, and quality of life among 126 Korean breast cancer patients who experienced altered appearance due to breast cancer treatment. We found that employed or socially active women had significantly higher distress from altered appearance and worse body image compared to housewives or retired people who were relatively socially inactive. Education and income had a positive effect on body image, and women who had higher education or higher income were more likely to have better body image than women with lower education or lower income. Overall quality of life was associated with participants' marital status and educational level.

In our study, employment status was significantly associated with altered appearance distress and negative body image after adjusting for age, disease stage,

current treatment type, and breast surgery type ( $p<0.05$ ). According to a recent study conducted in Malaysia (Tan et al., 2012), when breast cancer survivors resumed their jobs, dressing for work was an issue. Survivors were not able to dress properly in a more 'symmetrical' body image presentation, and their self-conscious awareness erodes their self-esteem especially in younger women. (Tan et al., 2012).

Working women might experience more distress due to altered appearance because of an unsupportive social environment towards breast cancer patients in the work place, which potentially worsens their body image as well (Maunsell et al., 1999; Kim et al., 2012a; Cho et al., 2013b). Regardless of highly developed medical science and increased survivorship in Korea, people had negative attitudes towards cancer patients (Cho et al., 2013b), and altered appearance might hinder breast cancer patients' social activities and job performance (Kim et al., 2012a). According to a national survey performed in 2009, 35.2% of the general Korean population agreed or strongly agreed that cancer patients could be easily recognized by looking at them; 45.3% said that they felt uncomfortable when they were with cancer patients (Cho et al., 2013b). Similarly, a 2011 study found that over 10% of cancer survivors experienced social discrimination because they had cancer (Cho et al., 2013a). Korean women with breast cancer said that they felt anxious about changed appearance and felt that co-workers were staring at their face and body (Kim et al., 2012a). Patients tried to conceal alopecia from co-workers and neighbors because of the negative stigma towards cancer patients (Kim et al., 2012a). Although Korean breast cancer patients might experience more altered appearance distress and poorer body image because of negative attitudes towards cancer patients in Korea, working breast cancer patients across the world might experience similar challenges and difficulties, especially women in Asian countries (Kim et



al., 2012a; Cho et al., 2013a; Cho et al., 2013b; Cho et al., 2014; Choi et al., 2014).

Several studies found that breast cancer patients often experience difficulties when continuing to work or returning to work after treatment because they had to cope with functional changes, support from co-workers and employers, and job flexibility (Ahn et al., 2009; Tiedtke et al., 2010). Therefore, it would be necessary to develop a tailored intervention program for working breast cancer patients, helping them to manage altered appearance and keep their self-confidence.

While employment status was negatively associated with body image, there was positive association between monthly family income and body image after adjusting for all other factors. This finding is similar to the studies that have reported that an increase in income was significantly associated with improvement in body image (Rumsey et al., 2004; Janz et al., 2005; Beatty et al., 2008). Given that educational levels correlate with income level, patients with higher education and higher income would possess more information and resources to utilize for managing altered appearance and lowered body image (Ashing-Giwa and Lim, 2009). Moreover, breast cancer patients reported better body image scores when they felt that they had a choice of making the treatment decision, indicating that communication with healthcare practitioners is crucial (King et al., 2000).

Consistent with numerous previous findings in our study, quality of life increased for patients who were married and for patients with more education than patients who were not married or patients with less education (Janz et al., 2005; Ahn et al., 2009; Ashing-Giwa and Lim, 2009; Salonen et al., 2009). Breast cancer patients who were married had more physical and psychosocial support than patients who were single, divorced, or separated because their husbands or partners helped them cope with changes and negative emotions (Ahn et al., 2009; Ashing-Giwa and Lim, 2009; Salonen et al., 2009). One study found that physicians spend more time with affluent and educated patients than with financially and educationally deprived patients who actually need more attention and care (Ashing-Giwa and Lim, 2009). This may be one of the reasons why education is positively associated with quality of life in our study. In our study, clinical characteristics other than mastectomy were not associated with altered appearance distress, body image, or quality of life. The results of our study indicate that socioeconomic factors could be better predictors of a breast cancer patient's altered appearance distress, body image, or quality of life than demographic or clinical characteristics.

Our study had several limitations. A primary limitation was that most of the data were self-reported that could be influenced by individual characteristics or social desirability. Additionally, this was a cross-sectional study; we were not sure in which direction the associations between socioeconomic status and altered appearance distress, body image, and quality of life outcome were related. Moreover, this study was performed at a community event, and people who participated in the event may be different from non-participants. The response rate, however, was relatively high, and characteristics of the

study population were fairly similar to those of Korean breast cancer patients in general. Lastly, our findings may not be generalizable to other countries where people would have different perspectives on cancer, socio-economic status, physical appearance, or body image. Despite these limitations, to the best of our knowledge, this is the first study that reported the importance of socioeconomic status and its impact on altered appearance distress and body image among breast cancer patients.

In summary, our findings indicate that socioeconomic status is highly associated with altered appearance distress, body image, and quality of life. Patients who suffer from altered appearance distress or body disfigurement are much more likely to experience psychosocial, physical, and functional problems than women who do not; therefore, their family, friends, partners, co-workers, and healthcare providers should be aware of the changes and distresses that breast cancer patients go through. In addition, it is necessary to provide specific information and psychosocial supports to socioeconomically more vulnerable patients so that they can cope well with the physical changes and emotional distresses and pursue their daily activities.

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## References

- Abu-Helalah M, Al-Hanaqta M, Alshraideh H, Abdulbaqi, N, Hijazeen J (2014). Quality of life and psychological well-being of breast cancer survivors in Jordan. *Asian Pac J Cancer Prev*, **15**, 5927-36.
- Ahn E, Cho J, Shin DW, et al (2009). Impact of breast cancer diagnosis and treatment on work-related life and factors affecting them. *Breast Cancer Res Treat*, **116**, 609-16.
- Ashing-Giwa KT, Lim JW (2009). Examining the impact of socioeconomic status and socioecologic stress on physical and mental health quality of life among breast cancer survivors. *Oncol Nurs Forum*, **36**, 79-88.
- Beatty L, Oxlad M, Koczwara B, Wade TD (2008). The psychosocial concerns and needs of women recently diagnosed with breast cancer: a qualitative study of patient, nurse and volunteer perspectives. *Health Expect*, **11**, 331-42.
- Cho J, Choi EK, Kim IR, et al (2014). Development and validation of Chemotherapy-induced alopecia distress scale (CADS) for breast cancer patients. *Ann Oncol*, **25**, 346-51.
- Cho J, Choi EK, Kim SY, et al (2013) (a). Association between cancer stigma and depression among cancer survivors: a nationwide survey in Korea. *Psychooncology*, **22**, 2372-8.
- Cho J, Smith K, Choi EK, et al (2013) (b). Public attitudes toward cancer and cancer patients: a national survey in Korea. *Psychooncology*, **22**, 605-13.
- Choi EK, Kim IR, Chang O, et al (2014). Impact of chemotherapy-induced alopecia distress on body image, psychosocial well-being, and depression in breast cancer patients. *Psychooncology*, **23**, 1103-10.
- Fayers PM, Aaronson NK, Bjordal K, et al (2001). The EORTC QLQ-C30 Scoring Manual 3<sup>rd</sup> edition, European Organization for Research and Treatment of Cancer: Brussels, Belgium.
- Fobair P, Stewart SL, Chang S, et al (2006). Body image and

- sexual problems in young women with breast cancer. *Psychooncology*, **15**, 579-94.
- Frith H, Harcourt D, Fussell A (2007). Anticipating an altered appearance: women undergoing chemotherapy treatment for breast cancer. *Eur J Oncol Nurs*, **11**, 385-91.
- Harcourt NR (2005). *The Psychology of Appearance*. Health Psychology, McGraw-Hill International.
- Janz NK, Mujahid M, Lantz PM, et al (2005). Population-based study of the relationship of treatment and sociodemographics on quality of life for early stage breast cancer. *Qual Life Res*, **14**, 1467-79.
- Karakoyun-Celik O, Gorken I, Sahin S, et al (2010). Depression and anxiety levels in woman under follow-up for breast cancer: relationship to coping with cancer and quality of life. *Med Oncol*, **27**, 108-13.
- Kim IR, Cho J, Choi EK, et al (2012) (a). Perception, attitudes, preparedness and experience of chemotherapy-induced alopecia among breast cancer patients: a qualitative study. *Asian Pac J Cancer Prev*, **13**, 1383-8.
- Kim KR, Chung HC, Lee E, Kim SJ, Namkoong K (2012) (b). Body image, sexual function and depression in Korean patients with breast cancer: modification by 5-HTT polymorphism. *Support Care Cancer*, **20**, 2177-82.
- King MT, Kenny P, Shiell A, Hall J, Boyages J (2000). Quality of life three months and one year after first treatment for early stage breast cancer: influence of treatment and patient characteristics. *Qual Life Res*, **9**, 789-800.
- Lemieux J, Maunsell E, Provencher L (2008). Chemotherapy-induced alopecia and effects on quality of life among women with breast cancer: a literature review. *Psychooncology*, **17**, 317-28.
- Maunsell E, Brisson C, Dubois L, Lauzier S, Fraser A (1999). Work problems after breast cancer: an exploratory qualitative study. *Psychooncology*, **8**, 467-73.
- Moorey S (2007). *The female body in mind : the interface between the female body and mental health*. Breast Cancer and Body Image, Routledge, 72-88.
- Ogden J, Lindridge L (2008). The impact of breast scarring on perceptions of attractiveness: an experimental study. *J Health Psychol*, **13**, 303-10.
- Preston MM (2010). An exploration of appearance-related issues of breast cancer treatment on sense of self, self esteem, and social functioning in women with breast cancer. (University of Pennsylvania Scholarly Commons (5-17-2010)).
- Rosenberg SM, Tamimi RM, Gelber S, et al (2013). Body image in recently diagnosed young women with early breast cancer. *Psychooncology*, **22**, 1849-55.
- Rumsey N, Clarke A, White P, Wyn-Williams M, Garlick W (2004). Altered body image: appearance-related concerns of people with visible disfigurement. *J Adv Nurs*, **48**, 443-53.
- Salonen P, Tarkka MT, Kellokumpu-Lehtinen PL, et al (2009). Telephone intervention and quality of life in patients with breast cancer. *Cancer Nurs*, **32**, 177-90.
- Schmid-Buchi S, Halfens RJ, Muller M, Dassen T, van den Borne B (2013). Factors associated with supportive care needs of patients under treatment for breast cancer. *Eur J Oncol Nurs*, **17**, 22-9.
- Schover LR, Yetman RJ, Tuason, LJ, et al (1995). Partial mastectomy and breast reconstruction. A comparison of their effects on psychosocial adjustment, body image, and sexuality. *Cancer*, **75**, 54-64.
- Tan FL, Loh S, Su TT, Veloo VW, Ng LL (2012). Return to work in multi-ethnic breast cancer survivors- a qualitative inquiry. *Asian Pac J Cancer Prev*, **13**, 5791-7.
- Tiedtke C, de Rijk A, Dierckx de Casterle B, Christiaens MR, Donceel P (2010). Experiences and concerns about 'returning to work' for women breast cancer survivors: a literature review. *Psychooncology*, **19**, 677-83.
- Wang K, Li X, Zhou C, et al (2013). Socio-economic factors influencing tumor presentation and treatment options in Chinese breast cancer patients. *Asian Pac J Cancer Prev*, **14**, 267-74.
- Yun YH, Bae SH, Kang IO, et al (2004). Cross-cultural application of the korean version of the european organization for research and treatment of cancer (EORTC) breast-cancer specific quality of life questionnaire (EORTC QLQ-BR23). *Support Care Cancer*, **12**, 441-5.