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### Quality of care: Distress, health care use and needs of women with breast cancer

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## Chapter 4

# Predictors of health care use of women with breast cancer: A systematic review

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## **Abstract**

*Objective:* The aim of this study was to identify predictors of health care use among women with breast cancer by conducting a systematic review.

*Methods:* Potentially relevant studies were identified by searching the PubMed, EMBASE, PsycINFO, CINAHL, and Cochrane Library databases. Also, backward and forward citation searches were performed. Studies were selected if they addressed associations between (a) sociodemographic, enabling (e.g., income), clinical and health related, or psychosocial predictors, and (b) medical, psychosocial or paramedical health care use of adult women with breast cancer. The health care types of interest were hospital utilization and provider visits. An evaluation of aggregated findings was performed to determine consistency of findings between studies.

*Results:* Sixteen studies were included in the review. Higher age, a more advanced cancer stage, more comorbid disorders, having a mastectomy, a lymph node dissection, and breast reconstruction, were consistently associated with higher hospital utilization. None of the patient characteristics were consistently associated with medical, psychosocial or paramedical health care use – but psychosocial or paramedical associations were also less examined.

*Conclusions:* Sociodemographic, medical and treatment-related factors were found to be consistently associated with (higher) health care use of breast cancer patients. Practitioners may use this information to anticipate future use of subgroups of patients. Results may also be used in the development of interventions that target relevant predictors, to reduce patients' health care use and accompanying health care costs. Furthermore, more research is needed to identify predictors of psychosocial and paramedical health care use.

## Introduction

Breast cancer is the most frequently diagnosed cancer among women worldwide <sup>1</sup>. As the world population is ageing and treatments are becoming more advanced, the number of breast cancer patients will keep rising <sup>2</sup>. This rise entails an increase in health care costs related to treatment of breast cancer and the consequences of having breast cancer.

One approach to diminish health care costs is to target frequent health care users with cost-effective interventions. For example, costs related to length of stay could be reduced through more timely discharge of older patients, after which they would receive adequate and less costly care at home or during outpatient visits <sup>3</sup> (see also <sup>4</sup>). Previous research also shows that relatively inexpensive, but effective, psychosocial interventions may save health care use and thus costs over time (e.g., <sup>5,6</sup>).

A prerequisite for successful implementation of such interventions is clear insight into the characteristics of the most frequent care users. But, while a number of individual studies have investigated which breast cancer patients were most likely to use curative medical, psychosocial, or paramedical care (e.g., visits to a physiotherapist), findings have not yet been systematically reviewed.

That is unfortunate as a review would enable aggregated evidence of previous, sometimes contradictory, findings. Moreover, it could provide further insight by specifying the phase in the disease trajectory in which patients' health care use takes place. Consequently, cost-effective interventions may target the most relevant characteristics at the appropriate time after diagnosis. This will increase the chance of successful implementation, in the interest of both patients and society.

Therefore, in this study we reviewed the available evidence regarding the following research questions:

1. Which patient characteristics of breast cancer patients are consistently associated with curative medical, paramedical and psychosocial health care use?
2. Do these patient characteristics differ per phase in the disease trajectory (i.e., health care use in the treatment, post treatment, or survivorship phase)?

## **Materials and Methods**

### *Search strategy and operationalization*

PubMed, EMBASE, PsycINFO, CINAHL, and the Cochrane Library were searched from the start of the databases until March 2012. Keywords were: cancer, predictor/association, and health care use as defined in the following paragraph. We chose to perform cancer generic searches, after initial trial searches indicated that some possibly relevant articles were not traced through breast cancer specific searches.

We focused on two principal measures of curative medical care use: number of physician visits and volume of hospital utilization (number of admissions, length of stay)<sup>7,8</sup>. Outpatient medical services were categorized as physician visits. To assess psychosocial care use we focused on number of visits to psychosocial care providers. Within the range of paramedical care measures we focused on number of physiotherapy visits, which may be especially relevant to include given the frequent occurrence of loss of strength and other arm problems after lymph node-related breast cancer treatments (e.g.,<sup>9</sup>).

### *Eligibility criteria*

Studies were included in the review if they were peer reviewed and addressed: (a) female breast cancer patients  $\geq 18$  years, (b) curative medical, psychosocial or paramedical health care use after diagnosis, and (c) associations between predictors and health care use.

Studies were excluded if they addressed: (a) an overall health care use measure based on more than one type of health care use – if one or more types were not covered by our operationalization, (b) medication or hormone specific predictors, or (c) predictors beyond the individual level (e.g., high volume hospitals). We also excluded studies (d) that examined trends over time, such as reduction in length of stay due to changing surgical practices <sup>10</sup>.

### *Selection process*

In a preliminary phase, the first two authors independently screened the results of a PubMed breast cancer specific search ( $n=971$ ). Initial agreement about which full texts should be retrieved was high ( $>99\%$ ). Results of this preliminary search were disregarded as the decision was made to perform cancer generic searches.

Given the high degree of agreement, the first author screened all the results of the definite cancer generic database searches, while the second author screened a random 10% of the sample. Full texts of potentially relevant articles were retrieved and independently evaluated. Disagreements about which articles should be retrieved or included were resolved through discussion. The references of included articles were hand-searched and the forward citation function of ISI Web of Science was used to identify other possibly relevant citations.

### *Evaluations of aggregated findings*

Following de Boer et al. <sup>7</sup>, we determined whether at least 60% of the studies that addressed a predictor found a significant or non-significant association between that predictor and health care use. If 40% to 60% of the studies showed associations in opposite directions (i.e., significant and non-significant associations, or associations in the positive and negative direction), the outcome of the evaluation was marked as 'unclear'.

An evaluation was only performed for associations that were examined in at least two studies. Studies that reported findings without levels of significance were excluded from the evaluation. If studies reported subanalyses, an association was evaluated as significant if significance was established in at least one subanalysis. If studies reported on uni- and multivariate analyses, only the multivariate results were evaluated.

## **Results**

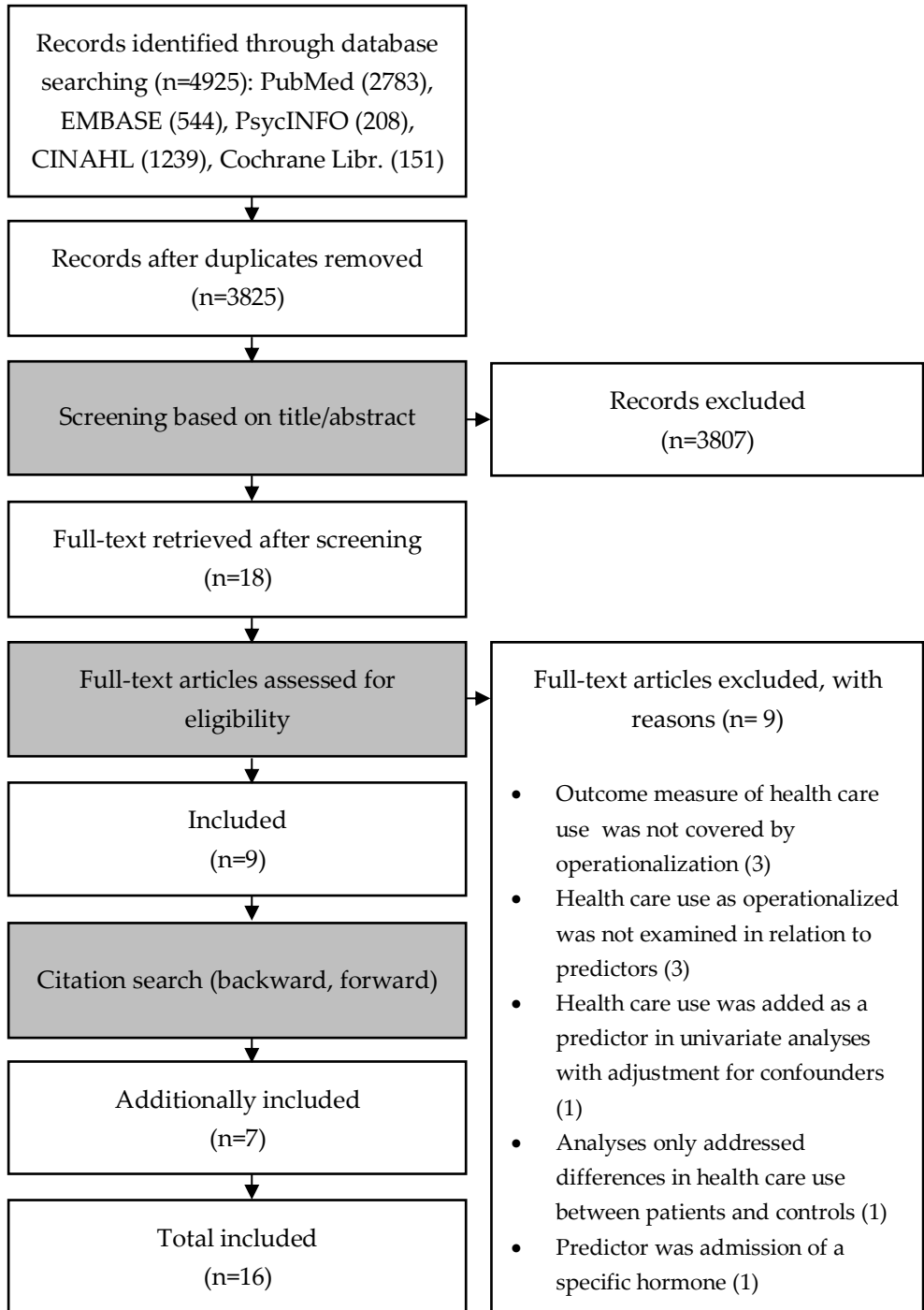
### *Selected studies*

The database searches resulted in 3825 non-duplicate hits. The full text of eighteen studies was retrieved, of which nine were selected. The backward and forward searches resulted in selection of seven additional publications. Thus, sixteen studies were included (11-26) (Figure 1).

### *Study characteristics*

Studies were published between 1994 to 2012, and originated from North America (#9), Europe (#6), and Australia (#1). All studies were written in English. The number of respondents included in the analyses ranged from 123 to 1316 for prospective studies, and from 73 to 8068 for retrospective studies.

Figure 1. Flow chart of study selection.





Four studies included early stage or stage I/II breast cancer patients. One study included breast cancer patients with stage IV or recurrence. Four studies included patients who had breast cancer surgery, without specifying the cancer stage in the inclusion criteria. One study included women with a palpable lump in the breast or an abnormality on the screening mammography, before diagnosis. One study included breast cancer survivors ten years after diagnosis, who were <75 years at diagnosis. Five other studies included breast cancer patients within a broader age range, and without specification of the cancer stage or the type of treatment in the in- and exclusion criteria.

Health care use was most extensively examined during the treatment phase (#5). Eight studies addressed health care use in subsequent phases (i.e., in the treatment or post treatment phase (#4), in the post treatment or survivor phase (#2), and in the treatment, post treatment or survivor phase (#2)). Health care use was operationalized in various manners, among which number of mean annual (cancer-related) hospitalizations or visits, length of stay, number of visits, and having had one or more visits (yes/no). The period assessed, varied from one month to three months and one year.

#### *Predictors of health care use and associations between predictors and use*

As expected, there was a large variety in predictors examined in relation to health care use. Seven (groups of) sociodemographic factors, two enabling factors (i.e., type of insurance and health plan type), sixteen clinical and health related factors, and seven psychosocial predictors were examined in relation to health care use. The number of studies that examined the same predictor, ranged from one to six. Age was most frequently examined (#10), followed by cancer stage (#9) and type of surgical treatment (with or without adjuvant therapy; #8).

Associations with regard to *hospital utilization* and *medical care use* were each examined in nine studies, of which seven respectively six studies reported use of multivariate analyses. Associations with regard to *psychosocial care use* were examined in four studies, including one that employed multivariate analyses. Associations with regard to *physiotherapy use* were examined in one study, which reported use of a multivariate analysis. Accompanying tables are available by contacting the first author.

#### *Results of the overall evaluations of aggregated findings*

*Sociodemographic factors – Hospitalization utilization* was consistently and positively associated with higher age: four of six studies showed significant findings, and all four in the same direction <sup>15,20,22,25</sup>. Hospital utilization was not consistently associated with cohabitation status, employee status, geographic location and race.

With respect to *medical care use*, it was unclear whether a higher level of education was a predictor of medical care use (i.e., 40% to 60% of the studies showed associations in opposite directions). Having had or higher medical care use was not consistently associated with age, cohabitation status, employee status, and race.

*Psychosocial care use* was not consistently associated with age, cohabitation status, education, and employee status.

*Enabling factors* – Associations between type of insurance respectively health plan type and various types of health care use were examined, but only in one study.

*Clinical and health related factors* – Higher *hospital utilization* was consistently associated with a more advanced cancer stage <sup>12,13,15,20,22</sup>, having more comorbid

disorders <sup>15,22,25</sup>, having a mastectomy <sup>15,19-22</sup>, having a lymph node dissection <sup>15,19,20</sup>, and having breast reconstruction <sup>15,21</sup>. Hospital utilization was not consistently associated with surgeon-related factors (e.g., median number of cases treated per year) or (having had or type of) adjuvant therapy. It was unclear whether geographic location of treatment was a predictor of hospital utilization.

*Medical care use* was not consistently associated with cancer stage, comorbidity, experiencing fatigue and adjuvant therapy. It was unclear whether type of surgery combined with or without adjuvant therapy was a predictor of medical care use.

*Psychosocial care use* was not consistently associated with cancer stage, comorbidity, adjuvant therapy, and surgical treatment combined with or without adjuvant therapy. It was unclear whether fatigue was a predictor of psychosocial care use.

*Psychosocial factors – Medical care use* was not consistently associated with mood-related symptoms.

With respect to *psychosocial care use*, it was unclear whether mood-related symptoms were a predictor.

#### *Results of the evaluations of aggregated findings per phase in the disease trajectory*

The only consistent findings were found with regard to the *treatment phase*: higher age, a more advanced cancer stage, having more comorbid disorders, having a mastectomy, and having a lymph node dissection were consistently associated with hospital utilization.

Fatigue, mood-related symptoms, adjuvant treatment, and surgery with or without adjuvant treatment were non-consistently associated with medical care use in the treatment/post treatment phase. Also, age, cancer stage, adjuvant

treatment and surgery with or without adjuvant treatment were non-consistently associated with psychosocial care use in the treatment/post treatment phase.

The association between location of treatment and hospital utilization in the treatment phase was unclear, as was the association between age and medical care use in the survivor phase. Also, associations between employee status, fatigue, respectively mood-related symptoms and psychosocial care use in the treatment/post treatment phase were unclear.

## Discussion

This review aimed to review the evidence regarding the patient characteristics that were consistently associated with health care use of women with breast cancer. We set out to perform a meta-analysis, with effect sizes. However, that was not possible due to the small number of studies that could be included, in combination with the large heterogeneity among studies. More specifically, the sixteen included studies largely varied in sources of data (hospital databases, claims, cancer registries, self-report), design (randomized intervention trials, prospective observational studies, retrospective studies), timing (various phases in the disease trajectory), and origin (seven different countries, each with its own health care system). The most important finding of this review is thus that the empirical evidence regarding the predictors of health care use of breast cancer patients is limited.

We did perform modest evaluations of aggregated findings. The evaluations showed that, not unexpectedly, higher age, a more advanced cancer stage, having more comorbid disorders, having a mastectomy, having a lymph node dissection, and having breast reconstruction were consistently associated with *hospital utilization*. When the phase of disease trajectory was taken into account, with the

exception of breast reconstruction, the same predictors were found to be consistently associated with hospital utilization in the treatment phase. There were no predictors consistently associated with *medical*, *psychosocial* or *physiotherapy* care use – but especially psychosocial and paramedical associations were also less examined.

As any review, the findings of this review were the results of a chain of procedural decisions. Important to mention is that there is no gold standard how health care use should be measured <sup>8</sup>. Assessment of other types and measures of health care may have led to different results. Nevertheless, we believe our results embody the larger part of health care use practices, as hospital utilization and physician visits are the two principal types of health care use <sup>8</sup>. Secondly, we also included studies based on self-report, some of which measured health care use over a longer period of time <sup>17,18,21,26</sup>. The results of these studies may have been influenced by recall bias. Finally, we did not encounter unpublished studies during our backward and forward hand searches, which may or may not indicate publication bias.

The most important implication of this study is that the scarcity of empirical evidence regarding the predictors of health care use of women with breast cancer highlights the need for extensive, prospective research. We would like to emphasize the need to also take into account sociodemographic factors other than age, and psychosocial factors, which have been rarely investigated. Fatigue and mood-related problems are highly relevant to include, as these factors are frequently occurring problems among breast cancer patients.

From the cost-effective perspective we suggest further research that examines associations between health care needs and psychosocial care use of breast cancer patients. Patients with information or emotional needs <sup>27</sup> may reach out to psychosocial providers, while their needs could be satisfied by written

information or other low-cost self-management (technology-based) resources. Additionally, we recommend future studies that take into account contextual and hospital system related characteristics of health care use.

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## References

1. Jemal A, Bray F, Center MM, et al. Global cancer statistics. *CA Cancer J Clin* 2011; 61: 69-90.
2. Boyle P, Levin B, (eds). *World cancer report 2008*. Lyon, France: World Health Organization, International Agency for Research on Cancer, 2008.
3. Borghans I, Kool RB, Lagoe RJ, et al. Fifty ways to reduce length of stay: An inventory of how hospital staff would reduce the length of stay in their hospital. *Health Policy* 2012; 104: 222-233.
4. Fallowfield L. Early discharge after surgery for breast cancer might not be applicable to most patients. *BMJ* 1998; 317: 1264-1265.
5. Arving C, Brandberg Y, Feldman I, et al. Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study. *Psychooncology* 2014; 23: 251-258.
6. Carlson LE, Bultz BD. Efficacy and medical cost offset of psychosocial interventions in cancer care: Making the case for economic analyses. *Psychooncology* 2004; 13: 837-849.
7. de Boer AG, Wijker W, de Haes HC. Predictors of health care utilization in the chronically ill: A review of the literature. *Health Policy* 1997; 42: 101-115.
8. Hulka BS, Wheat JR. Patterns of utilization. The patient perspective. *Med Care* 1985; 23: 438-460.
9. Ververs JM, Roumen RM, Vingerhoets AJ, et al. Risk, severity and predictors of physical and psychological morbidity after axillary lymph node dissection for breast cancer. *Eur J Cancer* 2001; 37: 991-999.

10. Kleinman JC, Machlin SR, Madans J, et al. Changing practice in the surgical treatment of breast cancer. The national perspective. *Med Care* 1983; 21: 1232-1242.
11. Azzone V, Frank RG, Pakes JR, et al. Behavioral health services for women who have breast cancer. *J Clin Oncol* 2009; 27: 706-712.
12. Baser O, Wei W, Henk HJ, et al. Patient survival and healthcare utilization costs after diagnosis of triple-negative breast cancer in a United States managed care cancer registry. *Curr Med Res Opin* 2012; 28: 419-428.
13. Baser O, Wei W, Xie L, et al. Retrospective study of patients with metastatic triple-negative breast cancer: Survival, health care utilization, and cost. *Community Oncology*, 2012; 9: 8-14.
14. Bickell NA, Shastri K, Fei K, et al. A tracking and feedback registry to reduce racial disparities in breast cancer care. *J Natl Cancer Inst* 2008; 100: 1717-1723.
15. Downing A, Lansdown M, West RM, et al. Changes in and predictors of length of stay in hospital after surgery for breast cancer between 1997/98 and 2004/05 in two regions of England: A population-based study. *BMC Health Serv Res* 2009; 9: 202.
16. Goldstein D, Bennett BK, Webber K, et al. Cancer-related fatigue in women with breast cancer: Outcomes of a 5-year prospective cohort study. *J Clin Oncol* 2012; 30: 1805-1812.
17. Grunfeld E, Julian JA, Pond G, et al. Evaluating survivorship care plans: Results of a randomized, clinical trial of patients with breast cancer. *J Clin Oncol* 2011; 29: 4755-4762.
18. Keyzer-Dekker CM, Van EL, Schreurs WH, et al. Health care utilization one year following the diagnosis benign breast disease or breast cancer. *Breast* 2012; 21: 746-750.



19. Lindqvist R, Moller TR, Stenbeck M, et al. Do changes in surgical procedures for breast cancer have consequences for hospital mean length of stay? A study of women operated on for breast cancer in Sweden, 1980-95. *Int J Technol Assess Health Care* 2002; 18: 566-575.
20. Lindqvist R, Alvegard TA, Jonsson PE, et al. Hospital stay related to tnm-stage and the surgical procedure in primary breast cancer. *Acta Oncol* 2004; 43: 545-550.
21. Mandelblatt JS, Lawrence WF, Cullen J, et al. Patterns of care in early-stage breast cancer survivors in the first year after cessation of active treatment. *J Clin Oncol* 2006; 24: 77-84.
22. Neutel CI, Gao RN, Gaudette L, et al. Shorter hospital stays for breast cancer. *Health Rep* 2004; 16: 19-31.
23. Oleske DM, Cobleigh MA, Phillips M, et al. Determination of factors associated with hospitalization in breast cancer survivors. *Oncol Nurs Forum* 2004; 31: 1081-1088.
24. Peuckmann V, Ekholm O, Sjogren P, et al. Health care utilisation and characteristics of long-term breast cancer survivors: Nationwide survey in Denmark. *Eur J Cancer* 2009; 45: 625-633.
25. Tartter PI, Beck G, Fuchs K. Determinants of hospital stay after modified radical mastectomy. *Am J Surg* 1994; 168: 320-324.
26. van de Poll-Franse LV, Mols F, Vingerhoets AJ, et al. Increased health care utilisation among 10-year breast cancer survivors. *Support Care Cancer* 2006; 14: 436-443.
27. Sanson-Fisher R, Girgis A, Boyes A, et al. The unmet supportive care needs of patients with cancer. Supportive care review group. *Cancer* 2000; 88: 226-237.