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Aina Johnsson, Tommy Fornander, Lars-Erik Rutqvist, Marjan Vaez, Kristina Alexanderson & Mariann Olsson

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ORIGINAL ARTICLE

## Predictors of return to work ten months after primary breast cancer surgery

AINA JOHNSSON<sup>1,4,5</sup>, TOMMY FORNANDER<sup>1,4</sup>, LARS-ERIK RUTQVIST<sup>1</sup>,  
MARJAN VAEZ<sup>2</sup>, KRISTINA ALEXANDERSON<sup>2</sup> & MARIANN OLSSON<sup>3,5</sup>

<sup>1</sup>Karolinska Institutet, Department of Oncology and Pathology, SE-118 83 Stockholm, Sweden, <sup>2</sup>Karolinska Institutet, Department of Clinical Neuroscience, Section of Personal Injury Prevention, SE-171 77 Stockholm, Sweden, <sup>3</sup>Karolinska Institutet, Department of Neurobiology, Care Sciences and Society, Division of Psychosocial Work, Karolinska Institutet, SE-141 86 Stockholm, Sweden, <sup>4</sup>Department of Oncology, Karolinska University Hospital, Södersjukhuset, SE-118 83 Stockholm, Sweden and <sup>5</sup>Department of Social Work, Karolinska University Hospital, SE-141 86 Stockholm, Sweden

### Abstract

**Background.** The most common female cancer in Western countries is breast cancer and women diagnosed with this disease are often under 65 years old. With increasing prevalence of survivors it is important to shed light on problems facing these women after diagnosis and treatment. The aim of this study was to assess factors predicting return to work (RTW) in women with early-stage breast cancer. **Material and methods.** A cohort of 102 women aged 18–64 with early-stage breast cancer who had undergone curative primary surgery with or without systemic adjuvant therapy were followed for 10 months using data from questionnaires and medical files. **Results.** Ten months after primary surgery, 59% of the women had returned to work while 41% were sick-listed part-time or full-time. After adjusting for age, health status, life satisfaction, vocational situation, and irradiation to the breast/chest wall and regional nodes, a multivariate logistic regression revealed the following factors as being negatively associated with RTW: a high-demand job (OR = 0.1, 95% CI 0.0–0.8), axillary node dissection (OR = 0.1, 95% CI 0.0–0.6), and treatment with chemotherapy (OR = 0.1, 95% CI 0.0–0.7). **Discussion.** Treatment factors and high demands at work play an important role in RTW for women with early-stage breast cancer.

Breast cancer is the most common type of cancer among women in the Western world. In Sweden a third of all cancers diagnosed among women aged between 25 and 69 years are breast cancer [1]. Earlier diagnoses and new and better treatments have increased the likelihood of long-term, disease-free survival [1]. Despite this, only a few studies have addressed problems associated with return to work (RTW), even if in recent years the interest has increased [2].

In a review published 2007, Taskila and Lindbohm report that the majority of the studied cancer survivors were able to continue working after treatments were completed. The employment rate in reviewed studies ranged from 41 to 84% [3]. Impaired work ability was associated with cancer type, type of treatment, health status, education and

physical demands. The few studies focusing on work-related psychosocial factors report that social support from occupational health services, and workplace accommodations for people with cancer disease were factors associated with RTW [2].

Opportunities to work flexibly, disclosure to colleagues, difficulties managing fatigue, and paid time-off to attend medical appointments were associated with continuing to work during treatment, while managing fatigue, stress, physical changes, as well as advice received from a doctor, and meeting with the employer were factors facilitating RTW [3]. In a study from the USA, blue-collar jobs, heavy lifting at work, and perceived discrimination by the employer due to a cancer diagnosis were work-related factors independently associated with a lower likelihood of RTW at 12 months after breast cancer

diagnosis [4]. Poor health status before the diagnosis, and an advanced tumour stage, has also been shown to be a hindrance for RTW [4].

Breast cancer disease and its attendant therapies may cause physical and mental problems that are a hindrance for RTW. Surgery and radiotherapy to regional nodes may have secondary effects, such as oedema and other arm problems [5] and chemotherapy may cause e.g. fatigue and cognitive dysfunction [6]. These secondary effects may affect work capacity even after treatments are completed [7]. In one study, women diagnosed with early-stage breast cancer were absent an average of 11.4 months because of cancer [8]. The absence was strongly influenced by the type of treatment, with especially chemotherapy resulting in absence.

The aim of this exploratory study was to identify factors influencing RTW after surgery for early-stage breast cancer in Sweden.

## Material and methods

This prospective cohort study included women who had undergone surgery for breast cancer and who were treated at the Department of Oncology at the Karolinska University Hospital, Södersjukhuset, in Stockholm, Sweden. The women were enrolled consecutively and asked to participate in the study about 6 weeks after surgery.

### *Inclusion criteria*

All women aged 18–64 years with a new and histologically verified invasive breast cancer or ductal cancer in situ (DCIS) were included if they had undergone primary surgery, had no clinical evidence of distant metastases, lived in the Stockholm area, were able to understand and read Swedish, and reported having worked part-time or full-time before the diagnosis of breast cancer.

### *Exclusion criteria*

The exclusion criteria were inoperable breast cancer, prior irradiation, prior neo-adjuvant chemotherapy, and prior endocrine therapy.

Women who had been on sick leave for more than 6 months prior to the breast cancer diagnosis, and women suffering from another serious disease were also excluded.

The recruitment period lasted 13 months in total (November 2002 to January 2003, plus November 2003 to August 2004). The first 3 months were planned as a pilot study, but since no changes were made in the study design, the women recruited during these months were also included in this study.

The study was approved by the Ethics Committee of Stockholm County.

### *Data*

Two types of data were obtained, from repeated questionnaires and from the medical files.

### *Questionnaires*

Two comprehensive questionnaires were compiled, one to be used at inclusion 6 weeks post-surgery, and the other to be used at follow-up 10 months after surgery. As far as possible, validated and frequently used instruments were used, and both questionnaires were tested in a pilot study. The questionnaire used at inclusion covered demographic characteristics and self-rated health, using questions from Statistics Sweden [9,10], sense of coherence (SOC 3) [11], life satisfaction (LiSat-11) [12], socio-economic status as defined by the classification system used by Official Statistics Sweden [9], job strain (according to Theorell and Karasek) [13], and social support at the workplace (according to Johnson and Hall) [14]. The questionnaire also included two items to measure previous sickness absence. This was measured by the number of days of self-reported sick leave in the previous 12 months. The response options were: 0, 1–7, 8–30, 31–90, and >90 days. Furthermore, in an open-ended question the respondents were asked to report the disease that had caused sickness absence.

Return to work was measured in this study by one item in the follow-up questionnaire and defined by the answer 'working to the same extent as before the breast cancer'.

### *Medical files*

From the medical files, treatment characteristics were obtained and classified regarding surgery, irradiation (RT), chemotherapy, and endocrine therapy.

### *Statistical methods*

The variable 'previous sickness absence' was constructed as a 3-point scale. Previous sickness absence was set as 0–30 days, >30 days due to the breast cancer diagnosis, or >30 days due to other diagnoses.

All other variables were dichotomised, as indicated in Tables I and III. A  $\chi^2$  test was used to examine the statistical significance of the associations between RTW and individual and family background, living and working conditions, financial

Table I. Demographic and social characteristics at inclusion.

	n
Age	
35–50	31
51–63	66
Educational level	
Nine-year school/Upper secondary school	64
University	33
Living with husband/partner	
Yes	64
No	33
Living with child <18 years of age	
Yes	19
No	78
Born in Sweden	
Yes	81
No	16
Sick-leave days in last 12 months	
0–30	55
>30 days due to the breast cancer diagnosis	24
>30 days due to other diagnosis	13
Missing	5
Self-rated health	
Very good or good	68
Fair, poor, or very poor	28
Missing	1
Manual work	
Yes	19
No	76
Missing	2
Full-time job	
Yes	74
No	23
Job strain	
Low demand/high control	59
High demand/high control	14
Low demand/low control	18
High demand/low control	4
Missing	2

situation, previous sickness absence, self-rated health, sense of coherence, life satisfaction, and type of treatment. The level of significance was set at  $p < 0.05$ .

Logistic regression including calculations of odds ratio (OR) and 95% confidence interval (CI) was used to examine the impact of the following factors on the likelihood of RTW after 10 months: age, country of birth, previous sickness absence, self-rated health, life satisfaction (satisfaction with life as a whole and with work), job demands, and type of treatment after diagnosis. An adjusted model included only variables from the baseline questionnaire, which had statistically significant associations with RTW at follow-up. The respective reference groups comprised those subjects aged 35–50 years who had had  $\leq 30$  days of sick leave in the previous

12 months, who had good self-rated health, who were satisfied with their life and working life, and whose treatment had not included axillary dissection, chemotherapy, or irradiation to the breast/chest wall and regional nodes.

## Results

The inclusion criteria were fulfilled by 132 women, 13 of whom declined participation. A further 17 were not invited to participate, because of administrative problems, and so the final cohort consisted of 102 women, 97 of whom (95%) completed the study. Of these 97, one-third were <51 years of age, two-thirds had an educational level lower than university, two-thirds lived with their husband or partner, and one-fifth lived with underage children (Table I). The majority was born in Sweden. During the previous 12 months, 37 of the women had had >30 days of sick leave, in 25 cases due to the breast cancer diagnosis. Self-reported health was mostly good or very good. The majority of the women performed non-manual work tasks, worked full-time, and had jobs with low demands and high control. Surgery and adjuvant treatment characteristics are shown in Table II. Fewer than half of the women had undergone mastectomy, while most of them had undergone an axillary node dissection. Two-thirds were offered irradiation, less than one-third were offered chemotherapy, and nearly all were offered endocrine therapy. At follow-up 10 months (range 9–13 months) after surgery, all participants had completed their course of chemotherapy and/or irradiation, and endocrine treatment had commenced for those who had been offered it.

Table II. Surgery and adjuvant treatment characteristics.

	n
Breast surgery	
Mastectomy without immediate breast reconstruction	36
Mastectomy with immediate breast reconstruction	4
Sector resection	57
Axillary surgery	
Axillary node dissection	72
Only sentinel node or no axillary node dissection	25
Irradiation (RT)	
RT only to breast parenchyma	52
RT to breast/chest wall and regional nodes	14
No RT	31
Chemotherapy	
Chemotherapy	31
No chemotherapy	66
Endocrine therapy	
Endocrine therapy	90
No endocrine therapy	7

Ten months after surgery, 59% of the women were working their pre-diagnosis hours and the remaining 41% were on part-time or full-time sick leave. Of the women not treated with chemotherapy, 78% were working the hours they had worked before diagnosis, as were 17% of the women treated with chemotherapy.

In the univariate analyses, the baseline factors associated with a higher likelihood of RTW at 10 months after surgery were  $\leq 30$  days of sick leave during the previous 12 months, very good or good self-rated health, high satisfaction with life as a whole and also with the vocational situation, low demand in the work situation, having been born in Sweden, no axillary dissection, no irradiation to breast/chest wall and regional nodes, and no chemotherapy (Table III). However, the fact that women born in Sweden had a higher likelihood of RTW was an association that was deemed necessary to interpret with caution and was not entered into the adjusted model, since few women in the study were born outside Sweden. Age, educational level, marital status, living with underage children, manual work,

and full-time work before the diagnoses were not associated with RTW.

The only factors independently predicting RTW in the multivariate analyses were low demands at work, no axillary dissection, and no chemotherapy (Table III).

## Discussion

Our study identified one work-related factor, a high-demand job, and two treatment-related factors, axillary node dissection and treatment with chemotherapy, as the only independent factors negatively associated with RTW. These results are in partial agreement with previous reports.

The methodological strengths of our study include the prospective cohort study design, the low external and internal drop-out rates, and the use of well-known and validated instruments. Another advantage is that our study was based on a consecutive clinical population, including nearly all eligible women treated for breast cancer in the southern part of Stockholm during the study period.

One limitation of the present study is the small sample size, which may have resulted in failure to detect associations between RTW and the other factors studied. Another limitation is that only Swedish-speaking women were included, meaning that our results may not be representative of women with early-stage breast cancer who do not understand Swedish. Finally, the data from the questionnaires were self-reported, and therefore reflect the patients' own interpretation.

Ten months after surgery, almost 60% of the women had returned to work. A cut-off time of 10 months was chosen since all treatments with chemotherapy and irradiation were expected to have been completed by that point. This RTW rate was similar to that found in previous studies in Europe and North America, confirming that the rate of RTW among women treated for breast cancer appears to be fairly high [4,7,8,15].

One of the strongest predicting factors for not returning to work in our study was treatment with chemotherapy. This is in concordance with results reported for The Netherlands, where RTW after early-stage breast cancer was determined by the type of treatment, and where treatment with chemotherapy caused the longest sickness absence [8]. The finding that breast cancer-diagnosed women treated with chemotherapy are sickness absent to a greater extent than women who have not received this treatment is reported also in studies from North America [16,17].

In our study, social and demographic factors such as age, educational level, living with underage

Table III. Crude and adjusted odds ratio (95% confidence interval) for having returned to work 10 months after breast cancer surgery (97 women).

Variable	Crude OR (95% CI)	Adjusted OR (95% CI)
Age		
35–50	1.0	1.0
51–63	1.9 (0.8–4.4)	1.9 (0.5–7.1)
Sick-leave days in the last 12 months		
0–30 days	1.0	1.0
>30 days	0.4 (0.2–1.0)	0.4 (0.1–1.6)
Self-rated health		
Very good or good	1.0	1.0
Fair, poor, or very poor	0.2 (0.1–0.6)	0.4 (0.1–1.8)
LiSat–Life as a whole		
Satisfied	1.0	1.0
Not satisfied	0.4 (0.2–1.0)	1.4 (0.4–5.6)
LiSat–Vocational situation		
Satisfied	1.0	1.0
Not satisfied	0.4 (0.2–0.9)	0.3 (0.1–1.2)
Job strain		
Low demand	1.0	1.0
High demand	0.5 (0.1–0.8)	0.1 (0.0–0.8)
Axillary dissection		
No	1.0	1.0
Yes	0.1 (0.0–0.4)	0.1 (0.0–0.6)
RT to breast/chest wall and regional nodes		
No	1.0	1.0
Yes	0.0 (0.0–0.3)	0.3 (0.0–3.7)
Chemotherapy		
No	1.0	1.0
Yes	0.1 (0.0–0.3)	0.1 (0.0–0.7)

children, marital status, and manual work did not predict RTW after breast cancer. Only one work-related factor, high job demands, proved to be negatively associated with RTW. The results are partly contradictory to other studies on RTW. A review published in 2002 concerning factors associated with cancer survivors' RTW showed that socio-demographic characteristics were not associated with RTW. However, for increasing age, associations were mixed. Manual work, on the other hand, consistently influenced RTW [18]. The more recent literature on cancer survivors shows that education and physical demands are associated with RTW. A study from the USA, reporting specifically on breast cancer-treated women, states that age, having a blue-collar job, and heavy lifting were associated with RTW [4]. The fact that in our study, high job demands, one of two variables in the Karasek job strain model [13], predicted a low RTW rate, suggests that psychosocial work conditions play an important role also for breast cancer survivors. This has already been shown for RTW following other diagnoses, e.g. cardiovascular disease [19], and after carpal tunnel surgery [20]. The Karasek model has only recently been applied to breast cancer patients [21], but no differences in job strain were observed between cancer survivors and controls.

Our study was performed at a time when sentinel node dissection was still unusual, and therefore, distinguishing between sentinel node dissection and no axillary node dissection was not possible owing to low numbers of patients. Those who had no axillary lymph node surgery or who were treated with sentinel lymph node biopsy had a higher probability for RTW within 10 months compared with women treated with axillary lymph node dissection. This is possibly explained by the higher frequency of upper limb morbidity associated with the latter type of surgery. The method of surgery has previously been shown to have consequences for return to normal activity, including regular employment [20]. A Dutch study suggests that problems with reaching above shoulder level, which sometimes occur subsequent to axillary node dissection, may delay return to part-time but not to full-time work [8]. However, there is a risk that in the present study we have over-adjusted by adjusting for both axillary dissection and irradiation.

In this study, the most important obstacles to a return to full-time work were a high-demand job, axillary node dissection, and chemotherapy. Factors mentioned in the literature but not studied here include attitudes towards work and towards RTW among different stakeholders (the women themselves, health and social care staff, and employers), changes in the work situation following sickness

absence due to breast cancer, and how the absence itself affects RTW. This highlights the need for longitudinal cohort studies concerning the consequences for RTW of both new treatments and different job tasks. To acquire a basis for health-promoting measures among women with breast cancer, larger studies need to be performed with a sample size that would allow a more reliable analysis of the factors related to RTW.

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