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ORIGINAL ARTICLE

Work situation and sickness absence in the initial period after breast cancer surgery

LENA-MARIE PETERSSON¹, AGNETA WENNMAN-LARSEN¹, MARIE NILSSON¹,
MARIANN OLSSON² & KRISTINA ALEXANDERSON¹

¹Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden and ²Division of Social Work, Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, Stockholm, Sweden

Abstract

Background. Breast cancer is the most common cancer diagnosis in women, many of whom are of working age, and the five-year survival rate in Sweden is approaching 90%. Accordingly, aspects of working life and sickness absence are of increasing importance for breast cancer survivors and may have a long-term impact on health and quality of life of these women. The aim was to elucidate the work situation and sickness absence during the initial period after breast cancer surgery and to explore factors associated with sickness absence. **Material and methods.** This is a cross-sectional questionnaire study 4–6 weeks after breast cancer surgery of women aged 20–63 years, and living in Stockholm. A consecutive sample of 933 women were invited and 756 (81%) accepted to participate. Logistic regression analyses were computed to estimate crude and adjusted odds ratios for associations between sick leave and other variables. **Results.** Most women (86%) were employed (including self-employed) at diagnosis, and 91% of those worked $\geq 75\%$ of full-time. At time of survey, 56% were on sick leave, the majority for full-time. Low self-rated health, poorer health than before diagnosis, having a strenuous work posture, and younger age were associated with sick leave during the initial period after breast cancer surgery in both univariate and multivariate analyses. **Discussion.** The results of this study is not fully consistent compared to previous studies in this field, often performed in later phases after breast cancer surgery or after other cancer diagnoses. Therefore our results indicate that knowledge is needed during all phases of the breast cancer trajectory to determine factors of importance regarding sick leave and their impact throughout the disease trajectory.

Globally, breast cancer is the most common type of malignancy in women [1], and in Sweden it accounts for 29% of all cancers in women [2]. The proportion of women diagnosed with breast cancer is increasing, and the relative rate of survival is also rising, in Sweden the current five-year survival rate is 88% [3]. The rising survival rate is probably linked to early detection and improved treatment, and research efforts focused on these aspects have been successful. Moreover, many of the survivors are of working age, and hence there is a need for scientific knowledge on the life situation of these individuals, both during and after conclusion of treatment. Such information is largely lacking, but has been requested [4].

Among women in Sweden, cancer represents the third most common sick leave diagnosis after mental and musculoskeletal diagnoses, and sick-leave periods due to cancer are the second longest after those due

to mental diagnoses [5]. It has been estimated that the indirect costs (sick-leave, disability pension, premature mortality) constitute 70% of the total costs associated with breast cancer [6]. Sick-leave periods after breast cancer have been reported to be longer than expected and to show marked regional disparities [7]. Some studies have focused on work and sickness absence after cancer *in general*, but few of those have considered different diagnostic cancer groups separately [8,9]. Therefore, it is difficult to draw conclusions about specific diagnoses, since the outcome of disease and treatment varies substantially between different types of cancer. For reasons related to costs and, primarily, to reduce negative consequences for the individual women with breast cancer [10], it is essential to identify patterns and differences in sick leave and return to work (RTW) between groups of women with breast cancer, and the causes of these

Correspondence: Lena-Marie Petersson, Karolinska Institutet, Division of Insurance Medicine, Department of Clinical Neuroscience, Berzelius väg 3, plan 6, SE-171 77 Stockholm, Sweden. Tel: +46 8 52483220. Fax: +46 8 52483205. E-mail: lena-marie.petersson@ki.se

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disparities and their potential effects over time. Such studies are lacking but are needed to provide a knowledge basis for developing interventions intended to support women with breast cancer in work-related issues and also to minimize unnecessary sick leave and exclusion from the labor market [11].

Continuous contact with the workplace has proven to be important for cancer patients [12], to promote RTW, and to maintain normalcy in their life situation [13,14]. To facilitate such contact starting early in the disease trajectory (i.e. after surgery but before onset of anti-cancer treatment), knowledge is also needed about relevant factors that are already present before the breast cancer diagnosis and immediately after surgery. Factors that earlier have been found to be of importance for sickness absence and RTW, in different phases of the breast cancer disease trajectory are: age, education, manual and physically strenuous work, health status, and co-morbidities [15–18].

The aim of the present study was to investigate work market affiliation and sickness absence during the initial period after breast cancer surgery among women of working age, and to explore factors associated with sickness absence.

Material and methods

This cross-sectional questionnaire study represents the first results from an ongoing prospective longitudinal cohort study of 756 women who have undergone breast cancer surgery. Inclusion criteria were: recently undergone breast cancer surgery at one of the three hospitals in the Stockholm area, aged 20–63 years, living in Stockholm County, and literate in Swedish. Exclusion criteria were known distant metastasis, pre-surgical chemotherapy, and/or a previous breast cancer diagnosis. The women were included consecutively three to six weeks after surgery, at the first consultation for planning of further treatment.

A comprehensive questionnaire was developed covering several areas of relevance. In the present study, responses to the items regarding demographics, work, and sickness absence from the first (base-line) questionnaire were analysed.

Inclusion started in June 2007 and continued through November 2009. The patients received both oral and written information about the study, explaining that participation was voluntary, that they could withdraw at any time, and that the hospital would not be informed about whether or not they chose to participate (i.e. so that it would not affect treatment). Thereafter, they were given the first questionnaire and a prepaid return envelope.

The number of women included was determined by power calculations based on pilot studies [19] and general sick-leave rates.

Measures

Age was dichotomized into “younger” and “older” women ($<51/\geq 51$ years) by mean age (51.4 years). *Education* was considered as, “elementary school or equivalent (≤ 9 years)”, “grammar/secondary school (10–12 years)”, and “college/university”. For the logistic regression, these were dichotomized into “low” (elementary or grammar/junior secondary school) and “high” (college/university). *Marital status* was dichotomized into “married” or “not married”. *Living situation* was categorized as, “living with husband/partner”, “and/or other adult”, “and/or children”, or “alone”. *Having children* was categorized “yes” or “no”. *Country of birth* was categorized as “Sweden”, “Nordic country”, “other European country”, or “outside Europe”. *Co-morbidity* was dichotomized as, “no co-morbidity” and “one or more co-morbidities”.

Employment status at diagnosis was measured by the question “What was your working situation at diagnosis?”. The response options were “employed”, “on sick leave for more than three months”, “on disability pension”, “unemployed”, “student”, “on parental leave”, “on age pension”, and “homemaker”. More than one response could be chosen, and each option was followed by a space to fill in the percentage of full-time. Percentage of full-time work was used rather than hours worked per week, because in many jobs (e.g. shift work) full-time employment is less than 40 hours/week. Here $\geq 75\%$ is considered as full-time work. In Sweden, all people are covered by the national social insurance, which includes, e.g. disability pension for those whose work capacity is permanently reduced by at least 25% due to disease or injury. Moreover, all individuals with paid employment or receiving unemployment benefits are entitled to sickness benefit if unable to work due to disease or injury. Old-age retirement usually starts at 65 years, but can be granted earlier. All these benefits can be granted for part time (i.e. for a portion of the person’s normal work hours) if for example work capacity is only reduced by 25%. Sickness benefits cover about 80% of lost income, and disability pension and age pension at least 65%.

Strenuous work posture was measured by the three questions “Do you have to work with your arms above your shoulders or below your knees?”, “Do you have to work in a bent or twisted position, or in any other inappropriate posture?”, and “Does your job require heavy lifting?”, each with the five response options “rarely/never”, “not very often”, “sometimes”, “fairly often”, and “very often/always”. These three questions were used to create an average summated scale (summated and divided with number of items), “strenuous work posture”, with a Cronbach’s α of 90.4. This scale was dichotomized into “no strenuous work posture” (representing rarely, never, not very often) and

“strenuous work posture” (representing sometimes, fairly often, very often/always).

General health was assessed by two questions. One concerned general health during the past week and originated from EORTC QLQ C30 [20]: “How would you rate your overall health during the past week?”, with seven response options ranging from “very poor” (=1) to “excellent” (=7) as anchor points. The other considered health changes compared to six months ago: “Compared to six months ago, how would you rate your general health?” (modified from SF-36, which says 12 months ago [21]), with the five response options “much better now”, “somewhat better now”, “about the same”, “somewhat worse now”, and “much worse now”. The first question was dichotomized at median (=5) so that response options 5–7 represented “good health” and 1–4 “poor health”. The second question was dichotomized into “better or same health compared to six months ago” (much better now, somewhat better now, about the same) and “worse health compared to six months ago” (somewhat worse now, much worse now).

Length and grade of sick leave after surgery were measured as current status at the time of completing the questionnaire. The response options for “Are you currently on sick leave?” were “no”, “yes, for the past week”, “yes, for the past month”, “yes, for the past three months”, “yes, have been for more than three months”. For the logistic regression, this variable was dichotomized into “on sick leave” and “not on sick leave”. For grade, the response format was “on full-time” or “on part-time”, the latter with the option to fill in percent of full-time.

Statistical analyses

Analysis of variance (ANOVA) was used to determine age differences between participants, nonparticipants, and those missed for administrative reasons. Statistical differences in proportions of younger and older women (<51/≥51 years) were analyzed using two sided χ^2 with the significance level set at $p < 0.05$. Only women at risk of sickness absence ($n = 698$) (i.e. homemakers, full-time disability pensioners, and old age pensioners excluded) were included in logistic regression analyses. The regression analyses were computed to estimate crude and adjusted odds ratios (ORs) with 95% confidence intervals (CIs) for associations between sick leave and other variables, first adjusting for age and then for all variables that were significant in the univariate analyses.

Ethical approval

The study was approved by the Regional Ethical Review Board in Stockholm, Sweden.

Results

In all, 982 women fulfilled the inclusion criteria, and 933 of those were invited to participate. Forty-nine (5%) were not invited due to administrative failures. The questionnaire was completed and returned by 81% of the invited women ($n = 756$), who thus accepted participation (Figure 1). There were no age differences between those who agreed, refused to participate, or were missed due to administrative failure ($p = 0.54$, data not shown).

Sociodemographic characteristics of the participants are presented in Table I. Nearly half, (44.4%) of the women were younger than 51 years. The majority were married (54.4%), lived with a partner (69.5%), had children (85.8%), and were born in Sweden (82.9%), respectively. A statistically significant difference between the age groups was found for three aspects: a larger proportion of the younger participants had higher education ($p < 0.0001$), more younger than older women had no children ($p = 0.004$), and a larger proportion of older women had co-morbidities (53.6% and 37.8% for older and younger participants, respectively) ($p < 0.0001$).

Employment status at diagnosis

Considering the total sample, 86.2% ($n = 652$) were employed (including self-employed) at diagnosis (of those aged <51 years, 87.5% and aged ≥51 years, 85.2%) ($p = 0.37$) (Table II). Moreover, 32 (4.2%) were granted full-time disability pension, 20 (2.6%) were unemployed, and five (0.7%) were studying. Of those who were employed, 91.3% worked ≥75%, and 77.2% of those worked 100%. A few of the employed women were on part-time disability pension (2.6%) or were on long-term (>3 months) part-time sick leave

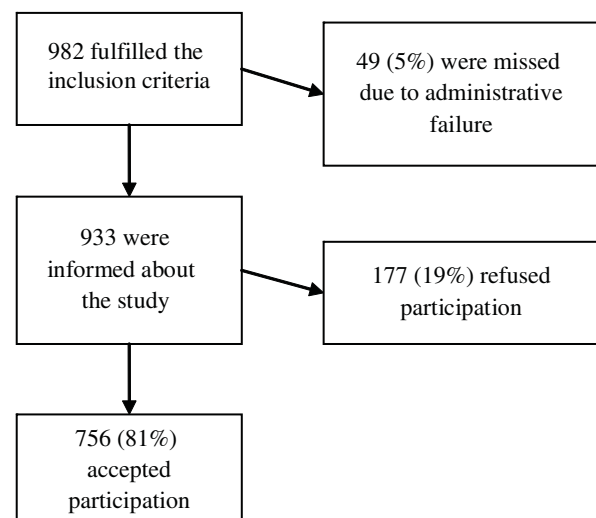


Figure 1. Enrolment of study participants.

Table I. Sociodemographic data on women who participated in the study (n = 756).

	Total
Age (years)	
Mean	51.4 (SD 8.1)
Median	52
Range	23–63
	n (%)
<51 years	336 (44.4)
≥51 years	420 (55.6)
Education	
Elementary school (≤9 years)	108 (14.3)
Grammar/Secondary school (10–12 years)	224 (29.6)
College/University	422 (55.8)
Missing	2 (0.3)
Married	
Yes	411 (54.4)
No	334 (44.2)
Missing	11 (1.5)
Living situation	
Living with husband/partner/other adult	345 (45.7)
Living with husband/partner/other adult and children	180 (23.8)
Living alone	140 (18.9)
Living with children	82 (10.8)
Missing	9 (1.2)
Children	
No	105 (13.9)
Yes	649 (85.8)
Missing	2 (0.3)
Country of birth	
Sweden	627 (82.9)
Other Nordic country	59 (7.8)
Other European country	27 (3.6)
Outside Europe	32 (4.2)
Missing	11 (1.5)
Co-morbidities	
No	404 (53.4)
Yes	352 (46.6)

(1.1%). Twenty four women (3.2%) had been on sick leave (10 full-time, 14 part-time) for more than three months at time of the breast cancer diagnosis. When answering the questionnaire, i.e. after surgery, 12 of these 24 women reported other diagnoses than breast cancer (e.g. mental, musculoskeletal, or cardiovascular disorders) as the reason for being on sick leave. The majority of the women reported having no strenuous work posture (68.4%).

Aspects of general health

Most women rated their general health during the past week as good (Table III), and there were no differences between younger and older women ($p = 0.08$). The majority (56.5%) rated their general health as the same (49.9%) or better (6.6%) compared to six months ago (i.e. before the cancer diagnosis). To a greater extent, younger women reported their general health as worse compared to six months ago, than older women ($p = 0.01$).

Table II. Employment status at breast cancer diagnosis (n = 756), percent of time worked by employed women (n = 652), and percent having strenuous work posture.

	n	(%)
Employed	611	(80.8)
and part-time disability pension	20	(2.6)
and part-time sick leave (>3 months)	8	(1.1)
and studying	7	(0.9)
and part-time parental leave	3	(0.4)
and part-time old-age pension	2	(0.3)
and part-time unemployed	1	(0.1)
Disability pension	32	(4.2)
and part-time old-age pension	1	(0.1)
Unemployed	20	(2.6)
and sick leave >3 months	3	(0.4)
and part-time disability pension	1	(0.1)
Sick leave >3 months	10	(1.3)
and part-time disability pension	3	(0.4)
Homemaker	12	(1.6)
Old-age pension	10	(1.3)
Parental leave	7	(0.9)
Student	5	(0.7)
Percent of time worked among those employed (n = 652)		
<50	13	(2.0)
≥50 to ≤74	43	(6.6)
≥75	595	(91.3)
Missing	1	(0.1)
Strenuous work posture		
No	517	(68.4)
Yes	139	(18.4)
Missing*	100	(13.2)

*Homemakers, old age and full-time disability pensioners included.

Sickness absence after surgery

More than half (56%) of the participants were on sick leave when answering the questionnaire, and about half of those women had been so for one month (Table IV). The majority were on full-time sick leave, and there were no differences between the older and younger women ($p=0.90$). Eight percent were not eligible for sick leave, because they had old-age or disability pension for full-time, or were homemakers without income from work. More women on sick leave (27%) than not on sick leave (12%) had jobs involving strenuous work postures ($p<0.0001$).

Factors associated with sickness absence

In the crude analyses, the following factors were associated with a higher OR of being on sick leave during the first period after breast cancer surgery: lower age, low general health in the past week, worse general health compared to six months ago (i.e. before breast cancer diagnosis), and having a strenuous work posture (Table V). Education and co-morbidity were not associated with being on sick leave. In the final model,

Table III. General health during the past week, and general health compared to six months ago (i.e. before breast cancer diagnosis).

	n	(%)
General health during the past week		
Good	420	(55.6)
Poor	310	(41.0)
Missing	26	(3.4)
General health compared to six months ago		
Same or better	427	(56.5)
Worse	299	(39.6)
Missing	30	(3.9)

the same factors were shown to be of importance for sick leave when adjusting for all significant variables (Table V).

Discussion

This population-based study of 756 working-age women, who had undergone breast cancer surgery, showed that the majority (86%) were employed (including self-employment) at the time of diagnosis, and most of those working (91%) worked full-time. When answering the questionnaire, about one month after surgery, 56% of the women employed at diagnosis were on sick leave, most of them full-time.

In the regression analyses, the highest ORs for being on sick leave during the initial period after breast cancer surgery were found for having, low self-rated health, strenuous work posture, worse health compared to six months ago, and being of younger age, which may not be surprising. Manual work and physical efforts have earlier been reported to be negatively associated with RTW in cancer survivors [8] and the questions here regarding strenuous work posture involved areas that may be related to symptoms in the arm and breast

Table IV. Length and grade of current sick leave (among those sick listed at the time of survey, n = 426).

	n	(%)
Length of sick leave		
1 week	72	(16.9)
1 month	209	(49.1)
3 months	80	(18.8)
> 3 months	41	(9.6)
Length not reported	22	(5.2)
Missing	2	(0.5)
Grade of sick leave		
Full-time	327	(76.8)
Part-time	81	(19.0)
Missing	18	(4.2)

after surgery. In this early phase of the disease trajectory, when more than half of the women were on sick leave, probably with surgery-related symptoms, the possibilities for adjustment of the work place and of work tasks may be limited or even not applicable. Women reporting co-morbidities in this initial period after surgery did not have higher ORs for sick leave after surgery and it might have been that those conditions had no effect at all on their work capacity in relation to their current work situation, because possible needed adjustments already may have been addressed. These results are in line with Villaverde et al. [22], who studied women with breast cancer early in the disease trajectory and found no impact of co-morbidity on work capacity, while the opposite has been observed later in the disease trajectory after diagnosis [16,18].

In most studies of sickness absence in *general*, high age and low educational level are risk factors for sickness absence [23]. In studies of work situation and *cancer* in general, results have been mixed regarding impact of higher age; some show none and others a negative impact on RTW [8]. However, in the present

Table V. Crude and adjusted odds ratio (OR) with 95% confidence interval (CI) for being on sick leave during the initial period after breast cancer surgery (n = 698).

Variable	Crude OR (95% CI)	OR adjusted for age (95% CI)	Final model* (95% CI)
Age (Ref: <51 years)			
≥51 years	0.61 (0.45–0.84)	–	0.70 (0.49–1.00)
Education (Ref: high)			
Low	0.92 (0.67–1.24)	0.94 (0.69–1.28)	–
Co-morbidity (Ref: no co-morbidity)			
Yes	1.11 (0.81–1.50)	1.19 (0.87–1.63)	–
General health during the past week (Ref: good)			
Poor	5.22 (3.66–7.47)	5.20 (3.63–7.45)	3.83 (2.56–5.73)
General health compared to six months (Ref: same or better)			
Worse	3.43 (2.43–4.84)	3.34 (2.36–4.72)	2.03 (1.36–3.03)
Strenuous work posture (Ref: no)			
Yes	2.68 (1.74–4.15)	2.70 (1.75–4.19)	2.57 (1.59–4.18)

*Only significant variables were included in the final model (age, general health during the past week, general health compared to six months ago, strenuous work posture).

study younger age was found to have a limited impact on sick leave when adjusting for all other significant variables and low education did not affect the risk of being on sick leave early after breast cancer surgery. Again these inconsistencies between our results and previous studies may be explained by the timing of assessments with regard to the disease trajectory, on diverging cancer diagnosis groups and including not only working age patients [8].

Many studies of sickness absence and other work-related factors among employees have been hampered by high selection bias regarding work capacity, i.e. the healthy worker effect. This means that among those that are working, especially among older and/or women, fewer have health problems than among those not working. This means that the generalizability of results is limited regarding diagnosis-specific work incapacity or sickness absence. To be able to draw conclusions about the effects of cancer on work capacity, it is an advantage to investigate populations with little exclusion from the labor market and where labor participation is high in terms of having or seeking a job or studying, also for those over 50 years of age. Sweden has the second highest rate of working women over the age of 55 in Europe [24] and do therefore serve as a good basis for the present kind of study.

Another strength of this study was the use of a large population-based sample, where information was obtained early after surgery, and the high participation rate. Non-inclusion for administrative reasons was mainly the result of lapses during the introduction phase of the study and somewhat during summer holidays with new temporary staff at the involved clinics. However, no age differences between participants and non-participants were found, indicating that these lapses can be considered not to have caused any biases in inclusion of the women.

The validity of self-reported data on sick leave, as used here, has been the subject of other studies and have been found to be good in comparison with for example employer register data [25]. Furthermore, the recall period was short (maximum two months), which minimizes the risk of recall bias.

The rates observed in the present study regarding women working and working full-time, also at older ages, are well in line with, albeit somewhat higher than, the general employment rates for women in Sweden [26]. This may be explained by recruitment in a metropolitan area, where employment frequency is higher and may also be explained by that women diagnosed with breast cancer generally have higher socioeconomic status, e.g. education [27]. Another explanation may also be that women who were illiterates or who were not fluent in Swedish were not included in the study, women who often generally have lower work participation

[28]. Another limitation was that, despite our intention to reach the women short after surgery before start of further treatment, due to unintended delays, some women may have already begun further treatment when they responded. We have no information about this factor, and thus the percentages of sickness absence might be overestimated, since chemotherapy has been shown to be an important predictor of sick leave in women with breast cancer during the first year after diagnosis [19]. However, the exclusion criteria ensured that the women had not received pre-operative chemotherapy and did not have advanced disease.

Research on sickness absence and employment conducted in this early stage of breast cancer disease trajectory is scarce [8]. Inconsistencies in our results compared to results from previous studies, conducted in different phases of the disease trajectory, indicates that knowledge is needed for all phases of the disease trajectory, to prevent negative long-term effects in this group of women.

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