



Women's experiences of encounters with healthcare professionals' regarding work after breast-cancer surgery and associations with sickness absence: a 2-year follow-up cohort study

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Abstract

Introduction Breast cancer (BC) is the most common cancer among women, and half of those diagnosed are of working age. Positive encounters regarding work from healthcare professionals have been shown to promote return to work among sickness absentees in general. However, the knowledge about encounters possible associations with sickness absence (SA) in women with BC is scarce.

Aim To explore if women had experienced encounters regarding work from healthcare professionals during the first year after BC surgery and if this was associated with SA during the second year after surgery, controlled for treatment and sociodemographic effects.

Methods A prospective cohort study of 690 Swedish women with primary BC, aged 24–63 years included after surgery. Descriptive statistics and adjusted logistic regression (age, birth country, education, self-rated health, treatment) with 95% confidence intervals (CI) were used.

Results Eighty percent of the women had experienced encounters regarding work. Women who got advice and support regarding work (adjusted odds ratio (OR) 0.5; 0.3–0.9) or were encouraged to work (adjusted OR 0.6; 0.3–0.9) had less SA. A larger proportion of those encouraged to work had less advanced cancer, surgery, hormone, or radiotherapy. Consistently, women encouraged to be on SA had more SA, but this was partly explained by disease or treatment factors (crude OR 1.6; 1.1–2.4, adjusted OR 1.2 (0.8–1.9) since a larger proportion of those with more advanced cancer, surgery, or chemotherapy had more SA.

Conclusion Most women experienced encounters regarding work, and the nature of these encounters were associated with SA 2 years after BC surgery.

Keywords Breast cancer · Sick leave · Disability pension · Encounters · Return-to-work

Background

Breast cancer (BC) is the most common cancer among women, with a 5-year survival of 90% [1, 2]. In Sweden, 50% of women diagnosed with BC are of working age [2], and in previous studies, most women with BC state that paid work is an important aspect of their lives [3, 4] and for recovery [5, 6]. With the high, rising incidence and survival rates, it is

expected that more women with BC will be of working age, but there is still a knowledge gap regarding why some of them do not return-to-work (RTW) as expected according to clinical recommendations after the BC surgery [7, 8].

The long-term probability for RTW between 1 and 5 years after the BC surgery varies largely internationally, from 43 to 93% [9–13]. A nationwide Swedish study revealed that during the first year after BC diagnosis, 71% of the women were on sickness absence (SA), and 5 years after the diagnosis, a higher proportion of women with BC had SA and disability pension (DP) compared to women of the same ages without BC [14]. Treatment-related side-effects are assumed to influence SA during the first year after surgery [8], observed to be most pronounced in women undergoing mastectomy or chemotherapy and hormonal treatment [15]. Healthcare professionals may have an important role in the women's SA during

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this period, and it has been shown that women with BC expect their assistance in prioritizing work and work continuation during treatment [16]. Several studies of sickness absentees with various diagnoses have shown that supportive and encouraging encounters regarding work with healthcare professionals promotes RTW [17–26]. In the very few studies conducted in this field, the types of encounters that have been shown to promote RTW among women with BC are giving adequate information and guiding the women with BC in work-related issues [10, 27] and healthcare professionals' attitudes regarding RTW [28]. Although previous research has indicated that encounters regarding work may influence RTW and SA among women with BC, these studies have not controlled for treatment or sociodemographic effects.

The aim of this study was to explore if women had experienced encounters regarding work from healthcare professionals during the first year after BC surgery and if this was associated with SA during the second year after surgery, controlled for treatment and sociodemographic effects.

Material and methods

This is a prospective cohort study with a 2 year follow-up using data from questionnaires, medical files, and registers. In total, 970 women who had undergone BC surgery were eligible. The women were screened for eligibility between June 2007 and November 2009 consecutively after BC surgery, at their first oncology clinic visit for discussion of further treatment. Eligibility criteria were the following: aged \leq 63 years, living in Stockholm, Sweden, literate in Swedish, with a first BC diagnosis not in-situ, and without known metastases or neoadjuvant treatment. Due to administrative oversight, 48 women were missed, resulting in 922 women informed about the study. Of these, 173 chose not to participate, and 749 (77.2%) women accepted to participate. As the outcome was SA or DP, we excluded those on DP for at least 50% of full-time working hours during the 2 years before the surgery ($n = 37$), and those on SA more than 50% 2 years' prior ($n = 4$). Given some women may have been on SA due to an acute response related to BC during the period of examination before the formal BC diagnosis and surgery, all with SA the year before surgery were included. We also excluded those who during follow-up reached the age for retirement in Sweden, 65 years ($n = 13$) or died ($n = 5$), resulting in 690 women included in the study sample.

Data

In this study, questionnaire and register data were used. Questionnaire data on sociodemographic characteristics, self-rated health, and encounters regarding work with healthcare professionals within 8 months from the date of

surgery, were collected through a comprehensive questionnaire. The questionnaires have been tested and are described in detail elsewhere [29, 30]. The baseline questionnaire was handed out to the women at the first visit at the clinic, about 4 weeks after the BC surgery, and follow-up questionnaires were sent to participants by post 4 and 8 months after surgery. For analysis, age was categorized from a continuous variable into “< 35,” “35–44,” “45–54,” “55–63” years. Education was dichotomized as “primary/secondary school” (\leq 12 years) and “college/university” ($>$ 12 years), and country of birth as “born in Sweden” or “born outside of Sweden”. Health was measured by the question “How is your health in general?” at 4 weeks (baseline) and 4 and 8 months respectively after surgery. The five response alternatives were dichotomized so that “excellent,” “very good,” and “good” were included in “good” and “fair” and “poor” in “not good” when analyzed. Encounters regarding work were measured by three questions: “In relation to your BC, have you been from healthcare professionals, (1) received useful advice and support related to work?, (2) been encouraged to be on SA?, and (3) been encouraged to work?” with four response options dichotomized so that “always” and “often” were included in “always/often” and “seldom” and “never” in “seldom/never” for the analyses. Further, measurement points baseline, 4, and 8 months were combined into having experienced the encounters at any of these time points.

From the Swedish nationwide clinical register for BC, data were obtained on cancer stage, type of surgery, and death. Pathological tumor-node (TN) classification [31] was dichotomized from TON0, stage 0 and 1 to “stage group 1,” and stages 2 and 3 to “stage group 2.” Breast surgery was dichotomized as less advanced “breast conserving” or more advanced “mastectomy including subcutaneous mastectomy,” and axillary surgery was dichotomized as less advanced “sentinel lymph node biopsy” or more advanced “axillary lymph node dissection including sampling.” From medical files, data were extracted regarding adjuvant treatment (yes/no), completed chemotherapy, radiotherapy and targeted therapy, and having hormone therapy, respectively, direct reconstruction (yes/no), and relapse within 2.5 years after surgery date (yes/no).

Data on SA and DP days were obtained from the Swedish Social Insurance Agency. In Sweden, all individuals from 16 years of age with income from work or unemployment- or parental benefits can be granted SA benefits if having reduced work capacity due to injury or disease. For most employed, the SA benefits are covered by the Social Insurance from day 15 of a SA spell; the first 14 days are covered by the employers. SA can be granted for full or part-time: 25%, 50%, or 75% of ordinary working hours. All people living in Sweden aged 19–64 can be granted DP if having long-term or permanent work incapacity due to disease or injury. In analyses of SA, we used net days in spells longer

than 14 days (net days were calculated so that two half-days equals one whole day, and then summed to total days per year). SA and DP days were calculated for four different time windows: (1) the 2 years before BC surgery, year minus 2 (year₋₂); (2) 1 year before BC surgery, year minus 1 (year₋₁); (3) 1 year after BC surgery, (year₁) and; (4) 2 years after BC surgery (year₂). For the analysis, SA was either used as a continuous variable or categorized to “zero days,” “90 days or less,” and “more than 90 days.” DP was used as a continuous variable.

Data analysis

Descriptive statistics were calculated for the characteristics of the study sample, including SA and DP days both separately and summed together, and for encounters regarding work with healthcare professionals. Furthermore, associations between background variables and having experienced encounters regarding work were calculated. Since very few women (5.1%) had DP at year₂, multivariable analyses were only conducted using SA as an outcome. In the multivariable analyses, the women who died ($n = 6$) or had a relapse ($n = 38$) during follow-up were excluded, as were women with any DP. This in order to ensure that encounters regarding work were not affected by the fact that these women already had a work disability in the form of DP at the surgery. To reveal associations between experiences of encounters regarding work year₁ and SA year₂ after the first BC surgery, odds ratios (OR) with 95% confidence intervals (CI) were calculated, using logistic regression. Both crude and adjusted OR were calculated, adjusting for age, education, country of birth, self-rated health at baseline, type of surgery, and chemotherapy in the multivariable analyses. Since there is a dependency between staging and treatment [8], only treatment variables and not TN classification were included. Analyses were conducted with the software SPSS 24 [32].

Results

The women were aged 24–63 years (mean 50.8 years), most of them were born in Sweden (84.5%), and more than half had college or university education (57.2%). At baseline, 60.4% of the women rated their health as excellent or very good. Four months after surgery, 38% rated their health as excellent or very good, and at 8 months after surgery, the proportion was 42.5%. According to the TN classification, two thirds of the women had cancer stages 0–1 (66.2%) and one third stages 2–3 (33.6%). Most of the women had had breast conserving surgery (66.8%) compared to mastectomy (33.2%). More than half had had sentinel lymph node biopsy (55.5%) compared to having had an axillary lymph node dissection (43.2%). A small proportion of the women had had a direct reconstruction

(15.4%). The majority received adjuvant treatment during the follow-up; radiotherapy (81.7%), chemotherapy (49.0%), and targeted therapy (12.9%), and also had started hormone therapy (81.2%). Within the period of 2.5 years, 5.1% had had a relapse (Table 1).

Occurrence of SA and DP

About one third (39.6%) of the cohort had had at least some SA > 14 days in the 3 months before the BC surgery (total mean 5.6; median 0.0 days) and few were on DP at the date of surgery (4.8%). A third of the women (36.2%) had at least some SA > 14 days year₂ from the surgery, among those with SA the mean number of days were 102.4 (Table 2). With regard to age, a slightly larger proportion of those who were aged < 35 and 55–63 years had SA 90 days or less year₂ from BC surgery compared to women aged both 35–44 and 45–54 years (< 35, 66.7%; 35–44, 57.1%; 45–54, 61.1%; 55–63, 64.6%). Also, of the women aged 35–44 and 45–54 years, a larger proportion had more than 90 and up to 180 SA days than women aged < 35 and 55–63 years (< 35, 11.1%; 35–44, 22.2%; 45–54, 20.4%; 55–63, 12.3%), while among women of all age groups, similar proportions had more than 180 days during the year₂ from the BC surgery (not shown in tables). Regarding DP, 5.1% had any DP in year₂ from surgery, with a mean number of 143.4 DP days during that year. In total, the mean number of SA/DP days in year₂ from the BC surgery was 111.8 among those with any SA or DP (Table 2).

Experienced encounters

A majority (80.4%) reported that they had experienced the encounter “advice and support related to work,” at least once within the first 8 months after surgery. About half of the women (50.6%) had experienced the encounter “encouraged to be on SA,” while 66.2% had experienced “encouraged to work” at least once (Table 3). In relation to sociodemographic characteristics and self-rated health, mostly similar proportions of women had experienced these three different encounters (Table 4). Regarding TN classification, a slightly larger proportion of the women with cancer stages 3–4 had been “encouraged to be on SA” (57.8%), while a larger proportion with stages 1–2 had been “encouraged to work” (70%). Concerning type of surgery, of those women who had mastectomy or axillary lymph node dissection, a slightly larger proportion had been “encouraged to be on SA” (mastectomy 55.9%; sentinel lymph node dissection 59.6%), while more of those with a sentinel lymph node biopsy were “encouraged to work” (71.4%). Of those who received chemotherapy, a higher proportion had experienced to be “encouraged to be on SA” (63.9%) and a higher proportion of those with hormone therapy or radiotherapy often/always were “encouraged to work” (67.0%; 66.3%) (Table 4).

Table 1 Characteristics of the cohort of 690 women having had a first breast cancer surgery; frequencies, percentages, mean, standard deviation (SD), median, range

	<i>n</i> (%)	Mean (SD)	Median (min/max)
Age		50.8 (8.1)	51.0 (24–63)
< 35	26 (3.8)		
35–44	118 (17.1)		
45–54	299 (43.3)		
55–63	247 (35.8)		
Country of birth			
Sweden	583 (84.5)		
Other	103 (15.5)		
Educational level			
Primary/secondary school	293 (42.5)		
College/university	395 (57.2)		
Self-rated health ¹	Baseline	4 months	8 months
Excellent	145 (21.0)	77 (11.2)	93 (13.5)
Very good	272 (39.4)	185 (26.8)	200 (29.0)
Good	179 (25.9)	219 (31.7)	244 (35.4)
Fair	66 (9.6)	146 (21.2)	99 (14.3)
Poor	6 (0.9)	23 (3.3)	8 (1.2)
TN classification ²			
Stages 0 and 1	457 (66.2)		
Stages 2 and 3	232 (33.6)		
Type of surgery			
Breast surgery			
Breast conserving surgery	461 (66.8)		
Mastectomy, including subcutaneous mastectomy	229 (33.2)		
Axillary surgery			
Sentimental lymph node biopsy	383 (55.5)		
Axillary lymph node dissection	298 (43.2)		
Direct reconstruction			
No	584 (84.6)		
Yes	106 (15.4)		
Type of other treatment			
Chemotherapy	338 (49.0)		
Radiotherapy	564 (81.7)		
Targeted therapy	89 (12.9)		
Hormone therapy	560 (81.2)		
Relapse within 2.5 years	38 (5.1)		

¹ At baseline 4 weeks, 4 months, and 8 months after breast cancer surgery, respectively² TNM classification: tumor, node, and metastasis staging

Associations with SA

Those who always/often had experienced the encounter “advice and support regarding work”, had fewer SA days during year₂ compared to women who had seldom/never experienced such encounters (mean: always/often 35.2; seldom/never 44.9 mean days) (Table 4). Those women who always/often

had been “encouraged to work” had fewer SA days year₂, compared to those who had seldom/never experienced such encounters (mean: yes 31.5; no 48.1).

In multivariable analyses of associations between encounters and days of SA, significant associations were found (Table 5). An association was found between having had “advice and support regarding work” and being SA more than

Table 2 Frequencies, percentages, mean, and median number of days with sickness absence (SA)¹, disability pension (DP), and any SA/DP, respectively, from 3 months before to 2 years after the date of first breast cancer (BC) surgery.

	Number of women <i>n</i> (%)	Mean (SD) days ¹	Median days
SA 3 months before BC surgery ¹	273 (39.6)	5.6 (11.8)	0.0
Part-time DP at date of BC surgery	33 (4.8)		
SA days year ₁ , among all women ¹	690 (100)	147.0 (125.9)	117.6
SA days year ₂ , among all women ¹	690 (100)	37.1 (78.0)	0.00
DP days year ₁ , among all women ²	690 (100)	7.1(32.6)	0.00
DP days year ₂ , among all women ²	690 (100)	7.2 (33.4)	0.00
Any SA/DP days year ₂ , among all women	690 (100)	44.4 (84.8)	0.00
SA days in year ₂ , among women with SA ¹	250 (36.2)	102.4 (100.6)	63.5
Among the women with any DP in year ₂ ²	35 (5.1)	143.4 (50.1)	182.5
Among the women with any SA/ DP in year ₂	274 (39.7)	111.8 (102.9)	79.5

¹ All SA days, spells ≤ 14 days excluded² All DP days during 1 year

90 days, compared to being SA 0–14 days, when adjusting for sociodemographic, type of surgery, and chemotherapy (OR 0.5; 95% CI 0.3–0.9). Those who had been “encouraged to be on SA” had higher odds for being SA 15–90 days, when adjusting for age group, country of birth, educational level (OR 1.7; 95% CI 1.1–2.5), as well as when including baseline self-rated health (OR 1.7; 1.2–2.6). The association were attenuated when further adjusting for type of surgery and chemotherapy. Women with BC who often/always had been “encouraged to work” had lower odds for being SA 91–365 days, compared to those being SA 0 days, when adjusting for age group, country of birth, educational level (OR 0.4; 95% CI 0.3–0.7), and baseline self-rated health (OR 0.4; 95% CI 0.3–0.7). The associations also remained after adjusting for type of surgery, and chemotherapy (OR 0.6; 95% CI 0.3–0.9).

Discussion

This prospective cohort study showed that a majority of the women with BC had experienced different types of encounters regarding work from healthcare professionals. Women who had experienced “advice and support regarding work” and “encouraged to work” had fewer SA days year₂, while those “encouraged to be on SA” had more SA days. The association

between “encouraged to be on SA” and SA was partly explained by treatment. Those with less advanced cancer stage and/or surgery, receiving hormone or radiotherapy were more likely to have experienced the encounter “encouraged to work,” while those with more advanced cancer stage and/or surgery and those receiving chemotherapy were more likely to have had the encounter “encouraged to be on SA.” Thus, encounters regarding work were associated with future SA 2 years after surgery.

Women included in this study were of working age, and considering their general health and state of disease, most would be expected to RTW after treatment according to Swedish recommendations for SA after BC surgery [8]. One third of the women had been on SA some time during the 3 months before the surgery, which may be related to a crisis response at the time for diagnosis. During year₂ from surgery, also one third of the women had been on SA. This could of course be associated with treatment, as shown in the multivariable analysis, but the question is, why are these factors associated with SA for some but not for all women when adjuvant treatments, except for hormone therapy, would be expected to have finished [8]? Persisting symptoms are one potential explanation, as women with BC have reported symptoms from treatment 10 years after treatment cessation [33]. SA after the first year could also be associated with unmeasured factors,

Table 3 Distribution of women with breast cancer (*n* = 690) having experienced three types of encounters at baseline (4 weeks), 4 months, and 8 months after the date of first breast cancer surgery, respectively, and at least once

Type of encounter	Baseline <i>n</i> (%)	4 months <i>n</i> (%)	8 months <i>n</i> (%)	¹ At least once <i>n</i> (%)
Advice and support regarding work	404 (58.6)	364 (52.8)	376 (54.5)	555 (80.4)
Encouraged to be on sick leave	253 (36.7)	212 (30.7)	179 (25.9)	349 (50.6)
Encouraged to work	272 (39.4)	263 (38.1)	333 (48.3)	457 (66.2)

¹ At least once, for questionnaire at baseline, 4 months, or 8 months after surgery

Table 4 Characteristics of the study population of 690 women having had a first breast cancer surgery; frequencies, percentages, mean, median, presented by at least once having experienced each of those three studied types of encounters

	Type of encounter					
	Advice and support regarding work		Encouraged to be on sick leave		Encouraged to work	
	Always/often mean (SD); median (min-max)	Seldom/never n (%)	Always/often mean (SD); median (min-max)	Seldom/never n (%)	Always/often mean (SD); median (min-max)	Seldom/never n (%)
Age	50.9 (8.0); 52.0 (24–63) mean (SD)/median	50.2 (8.3); 50.0 (27–63)	50.0 (8.4); 51.0 (24–63) mean (SD)/median	51.7 (7.6); 52.0 (29–63)	50.5 (8.1); 51.0 (26–63) mean (SD)/median	51.3 (8.0); 52.0 (24–63)
SA days ¹ during year ₁ after surgery	144.1 (123.5)/117.3	159.0 (135.2)/120.3	180.7 (121.0)/192.0	112.5 (121.6)/53.5.0	133.8 (115.2)/102.0	172.9 (141.4)/173.3
SA days ¹ during year ₂ after surgery	35.2 (77.2)/0.0	44.9 (81.2)/0.0	39.3 (77.7)/0.0	34.9 (78.4)/0.0	31.5 (72.2)/0.0	48.1 (87.4)/0.0
Country of birth						
Sweden	469 (80.4)	114 (19.6)	300 (51.5)	283 (48.5)	385 (66.0)	198 (34.0)
Other	84 (81.6)	19 (18.4)	47 (45.6)	56 (54.4)	69 (67.0)	34 (33.0)
Educational level						
Primary/secondary school	240 (81.9)	53 (18.1)	142 (48.5)	151 (51.5)	190 (64.8)	103 (35.2)
College/university	314 (79.5)	81 (20.5)	206 (52.2)	189 (47.8)	265 (67.1)	130 (32.9)
Self-rated health ²						
Baseline						
Good	489 (82.0)	107 (18.0)	307 (51.5)	289 (48.5)	401 (62.3)	195 (32.7)
Not good	54 (75.0)	18 (25.0)	31 (43.1)	41 (56.9)	43 (59.7)	29 (40.3)
Missing	12 (54.5)	10 (45.5)	11 (50.0)	11 (50.0)	13 (59.1)	9 (40.9)
TN classification ³						
Stages 0 and 1	374 (81.8)	83 (18.2)	214 (46.8)	243 (53.2)	320 (70.0)	137 (30.0)
Stages 2 and 3	180 (77.6)	51 (22.0)	134 (57.8)	98 (42.2)	137 (59.1)	95 (40.9)
Type of surgery						
Breast surgery						
Breast conserving surgery	367 (79.6)	94 (20.4)	221 (47.9)	240 (52.1)	306 (66.4)	155 (33.6)
Mastectomy, inc. subcutaneous mastectomy	188 (82.1)	41 (17.9)	128 (55.9)	101 (44.1)	151 (65.9)	78 (34.1)
Direct reconstruction	86 (81.1)	20 (18.9)	56 (52.8)	50 (47.2)	73 (68.9)	33 (31.1)
Axillary surgery						
Sentinel lymph node biopsy	334 (80.3)	82 (19.7)	188 (45.2)	228 (54.8)	297 (71.4)	119 (28.6)
Axillary lymph node dissection	214 (80.8)	51 (19.2)	158 (59.6)	107 (40.4)	152 (57.4)	113 (42.6)
Type of other treatment						
Chemotherapy	269 (79.6)	69 (20.4)	216 (63.9)	122 (36.1)	200 (59.2)	138 (40.8)
Radiotherapy	454 (80.5)	110 (19.5)	284 (50.4)	280 (49.6)	374 (66.3)	190 (33.7)
Targeted therapy	70 (78.7)	19 (21.3)	50 (56.2)	39 (43.8)	52 (58.4)	37 (41.6)
Hormone therapy	450 (80.4)	110 (19.6)	275 (49.1)	285 (50.9)	375 (67.0)	185 (33.0)

¹ SA, sickness absence and all SA days, spells ≤ 14 days excluded

² At baseline 4 weeks after breast cancer surgery

³ TN classification: tumor and node staging

Table 5 Frequencies, percentages, crude, and adjusted odds ratios (OR) with 95% confidence intervals (CI), comparing the associations between women with breast cancer (BC) without relapse within 2.5 years or any DP year 2 after BC surgery ($n = 621$) having experienced three types of encounter regarding work at least once at 8 months after the BC surgery and days of sickness absence (SA) during year 2 after the BC surgery

	Always/often <i>n</i> (%)	Model 0 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)
Advice and support regarding work							
SA 0–14 days	335 (82.7)/70 (17.3)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
SA 15–90	111 (81.0)/26 (19.0)	0.9 (0.5–1.5)	0.9 (0.5–1.5)	0.9 (0.5–1.5)	0.8 (0.5–1.4)	0.9 (0.5–1.4)	0.8 (0.5–1.4)
SA 91–365	57 (72.2)/22 (27.8)	0.6 (0.3–1.0)	0.6 (0.3–1.0)	0.6 (0.3–1.1)	0.6 (0.3–1.0)	0.5 (0.3–1.0)	0.5 (0.3–0.9)
Encouraged to be on SA							
SA 0–14 days	192 (47.4)/213 (52.6)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
SA 15–90	81 (59.1)/56 (40.9)	1.6 (1.1–2.4)	1.7 (1.1–2.5)	1.7 (1.2–2.6)	1.4 (0.9–2.1)	1.2 (0.8–1.9)	1.1 (0.7–1.8)
SA 91–365	42 (53.2)/37 (46.8)	1.3 (0.8–2.0)	1.3 (0.7–2.0)	1.3 (0.8–2.1)	1.0 (0.6–1.7)	0.7 (0.4–1.2)	0.7 (0.4–1.1)
Encouraged to work							
SA 0–14 days	282 (69.6)/123 (30.4)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
SA 15–90	95 (69.3)/42 (30.7)	1.0 (0.6–1.5)	0.9 (0.6–1.4)	0.9 (0.6–1.4)	1.0 (0.7–1.6)	1.1 (0.7–1.7)	1.1 (0.7–1.8)
SA 91–365	40 (50.6)/39 (49.4)	0.4 (0.3–0.7)	0.4 (0.3–0.7)	0.4 (0.3–0.7)	0.5 (0.3–0.8)	0.5 (0.3–0.9)	0.6 (0.3–0.9)

Model 0: crude; model 1: adjusted for age group, country of birth, educational level; model 2: adjusted for age group, country of birth, educational level, baseline self-rated health; model 3: adjusted for age group, country of birth, educational level, type of breast surgery, type of axillary surgery; model 4: adjusted for age group, country of birth, educational level, chemotherapy; model 5: adjusted for age group, country of birth, educational level, type of breast surgery, type of axillary surgery, chemotherapy

such as work conditions [34] or concerns about future life conditions [35, 36].

We found that a majority of the women had experienced some type of encounter regarding work. This may be contrasted to Braybrooke et al. [10], despite contextual differences, where a minority of women with BC who had undergone chemotherapy were found to have received information and encouragement regarding RTW. In a study by Ganem et al. [16], it was also shown that women with BC wish that healthcare professionals would raise issues related to work and discuss possibilities to continue to work during treatment, which in the present study many women had experienced. It has also been shown in previous studies, that by support and encouragement [37] or guidance and giving adequate information [10, 27], healthcare professionals can promote RTW among sickness absentees. Similarly, we have previously found that during the first year after BC surgery, a larger proportion of those who had been encouraged to work or had been encouraged to be on SA, had followed the encouragement [38]. In the present study, women with BC who had experienced encounters regarding work had fewer SA days. It is also possible that the encounters were targeted to the “right” individuals since those with less severe disease and less advanced treatment had been encouraged to work, and those with more severe disease and advanced treatment had instead been encouraged to be on SA. This is consistent with studies showing that women who had undergone mastectomy or who had chemotherapy were more likely to be on SA [9, 13, 15], especially during year₁ after surgery [14, 27]. Based on this assumption, we included both surgery and chemotherapy in the multivariable analyses and found that those factors to a large extent was associated with SA also during year₂ after surgery. There are also some other possible explanations for the differences in SA. It may be that women with BC followed what healthcare professionals encouraged them to do (to be on SA or not) regardless of disease status or general health, as shown in previous studies of the same cohort [4, 28]. Therefore, it would have been interesting to have information on healthcare professionals’ actual encounters and attitudes concerning SA and work, since the encounters should be based on the patients work capacity in relation to work demands rather than attitudes [4, 28]. It is important to note that 60% of women had no SA year₂ and additionally, not all women experienced any type of encounter regarding work.

Strengths and limitations

Strengths include the relatively large sample size, a great variety of variables, and collected data at several time points during the 2-year follow-up period giving a wide range of experiences over time among women with BC. Further, the response rate for the whole study population was almost 80%. The detailed information regarding different variables gave us

the possibility to exclude individuals without comparable risk for SA during follow-up, i.e., those with metastasis or relapse, since they can be assumed to have more SA. Also, we excluded those who would probably not receive encounters regarding work either due to their age, or due to already having other reasons for SA: those with retirement within follow-up, on > 50% DP year₋₂ and year₋₁, or having had > 50% SA year₋₂ from diagnosis.

Other strengths were that the questionnaire was based on questions that have been used in earlier studies [30]. The combination of the large sample size and background data including high quality information from registers and from medical files enabled sub-group analyses with adjustment for important factors known to be associated with SA/DP among women with BC. A limitation was that even though we had information regarding start of hormone therapy, we did not know about compliance and therefore were unable to control for that in the multivariable analyses.

Another strength is that the study is conducted in Sweden, with a high employment rate among women, including women in higher ages [39]. This means that the healthy selection effect of women in the work force is not as strong as in other countries.

To have self-reported data such as experiences of encounters regarding work may be seen as a strength since it presents experiences rated by the women themselves. The baseline question about experiencing certain encounters might also affect the experience of future encounters; therefore, we combined the questions from the three first time points, giving us the information about whether the women with BC had experienced the encounters at any time within the first year after surgery, i.e., during the period when treatment was ongoing.

A limitation of the study may be that even though we had high-quality register data on SA and DP for year₋₂ to year₂ from the date of BC surgery, we did not have information on SA in spells ≤ 14 days giving a possible underestimation of SA days. This may also be seen as a strength since only the more severe SA were included; e.g., not colds and migraines.

Conclusion

The majority of the women with BC had experienced encounters regarding work during the year₁ after their surgery and most had no SA during year₂ after surgery. Women having had more advanced surgery and/or had received chemotherapy were to a larger proportion on SA year₂. Encounters regarding work were associated with level of SA, and this association may be partly explained by type of surgery and chemotherapy but also by healthcare professionals’ encounters regarding work. A greater awareness of the influence of encounters regarding work among healthcare professionals is needed in order to promote RTW.

Compliance with ethical standards

The project was approved by the Regional Ethical Review Board in Stockholm, Sweden, Dnr: 2007/612–31/4, 2009/1623–32, 2013/713–32, 2014/1874–32.

Conflict of interest The authors declare they have no competing interests. The data cannot be made publically available according to Swedish regulations and laws. Readers may contact professor Kristina Alexanderson (kristina.alexanderson@ki.se).

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