Early retirement and non-employment after breast cancer

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Abstract

Objective: This study examined whether workplace support, sociodemographic factors and co-morbidity are associated with early retirement or non-employment due to other reasons among breast cancer survivors. We also compared quality of life and chronic symptoms (pain, fatigue, anxiety and depression) among employed, retired and other non-employed breast cancer survivors.

Methods: We identified breast cancer survivors diagnosed between 1997 and 2002 from either a hospital or a cancer registry in Denmark, Finland, Iceland and Norway (NOCWO study). All patients had been treated with curative intent. Information on employment, co-morbidity and support was collected via a questionnaire. The sample included 1111 working-aged cancer-free survivors who had been employed at the time of diagnosis. We used multinomial logistic regression models to analyse the association of various determinants with early retirement and other non-employment (due to unemployment, subsidized employment or being a homemaker).

Results: Low education, low physical quality of life, co-morbidity and pain were associated with both early retirement and other non-employment after cancer. Other non-employed survivors also rated their mental quality of life as lower and experienced anxiety and fatigue more often than all the other survivors. Moreover, they reported a lower level of supervisor support after their diagnosis than the employed survivors. Retired survivors more often reported weak support from colleagues.

Conclusions: Differences in ill health and functional status between various groups of non-employed cancer survivors need to be considered when planning policy measures for improving the labour market participation of this population and preventing their early withdrawal from working life. Copyright © 2013 John Wiley & Sons, Ltd.

Introduction

Most breast cancer survivors, about 80%, return to work after their diagnosis and treatment. Breast cancer survivors are, however, more likely to remain outside the workforce than people without cancer [1]. Literature has shown that the risk of taking early retirement pension is higher among these women than that among cancer-free women [2–5]. A Danish study indicated that breast cancer survivors are also at a small increased risk of unemployment compared with women without cancer [6]. According to a Swedish study, the risk of unemployment was, however, minor among breast cancer survivors [4].

Previous studies have focused on cancer survivors who have returned to work; little research has been performed to investigate different subgroups of survivors outside the labour market or the factors that affect their work cessation. Non-employed, working-aged survivors are a heterogeneous group, including unemployed people, homemakers and those who have retired early because of disability or other reasons. The transition from sick listed to working, early retirement pension or non-working might well follow different pathways. Early retirement pension is primarily assigned to people on the basis of their health status, whereas unemployment is also affected by other factors related to work and society.

Older age, low education, low income, manual work, a high demand job, co-morbidities, undergoing chemotherapy and a non-supportive work environment have been reported as barriers for returning to work among breast cancer survivors [7]. Changed priorities in life have also been suggested as a factor promoting work cessation. Two studies provide group-specific information on the risk factors of non-employed breast cancer survivors. A Danish study indicated that the rate of early retirement was higher for survivors with somatic co-morbidity or previous depression. Living with a partner and having undergone chemotherapy were associated with a reduced hazard ratio for taking early retirement [8]. A Norwegian study in turn reported that the risk of receiving disability pension increased with mastectomy, low educational level, low income, older age, living in rural areas and not having

children of <18 years in the household among breast cancer patients [5]. Among all cancer survivors, being 50–60 years of age at the time of diagnosis, manual work, medium income and vocational education were risk factors for unemployment [6].

The aim of our study was to investigate whether sociodemographic factors, such as marital status, education and occupational status, as well as treatment, co-morbidity and social support from the workplace at the time of diagnosis, are associated with early retirement or other non-employment among cancer-free breast cancer survivors, employed at the time of diagnosis. We also compared experiences of pain, fatigue, anxiety and depression, and quality of life among employed, early retired and other non-employed breast cancer survivors. Identifying the factors that lead to unwillingly leaving the work force in different groups of cancer survivors is important in terms of supporting people with cancer in retaining their jobs and preventing early departure from the work life.

The current study is part of a larger research project: the Nordic Study on Cancer and Work (NOCWO) [9]. The aim of this project was to clarify the problems that people with cancer face in work life and to identify the factors that either facilitate or hamper the process of returning to work. As there was little research in the area, collaboration between the Nordic countries was considered valuable in order to utilize all their available experience and knowledge of this field of research. The participating countries were Denmark, Finland, Iceland and Norway. The study was approved by either scientific ethics committees or data protection agencies of the participating countries.

Material and methods

Participants

Patients with breast cancer during the period 1997–2002 were identified from the files of one large hospital (Finland and Norway) or the cancer registry (Denmark and Iceland). In Denmark, patients from only three main cities were included. Because of the study's focus on employment, eligibility was limited to those aged 25–57 years at the time of diagnosis. The selected patients had been treated with curative intent (no advanced disease or recurrence) and were not currently undergoing chemotherapy or radiotherapy. In Iceland, patients with recurrent disease were excluded, but information on the stage of disease or metastasis was not available. The total number of identified breast cancer survivors was 2135.

Data on employment, co-morbidity, sociodemographic and health-related factors and support from the workplace were collected using a questionnaire. The original Finnish questionnaire was translated into the other Nordic languages following the EORTC Quality of Life Group Translation Procedure [10]. Translations followed a forward–backward procedure, independently carried out by two native speakers of the target language. The translated questionnaires underwent pilot testing.

The questionnaires were mailed to the study participants in 2003–2005, that is, 1–8 years after cancer diagnosis. In Finland, two reminders were sent by post; in Denmark, two reminders were sent and a phone call was made to the non-responders; and in Iceland and Norway, only one reminder was sent.

The response rate of the breast cancer survivors was 76% (N = 1614), and valid questionnaires were obtained from 70% (N = 1490). From this population, we excluded those over the age of 63 years (N = 31), those whose cancer had recurred (N = 79) and those who were receiving old-age pension (N = 15). For the analyses presented here, we included only those who had been employed at the time of diagnosis, leaving out those who were students, unemployed, otherwise not employed, or unknown (N = 254). The final analysed population comprised 1111 working-aged breast cancer survivors.

Employment status and sociodemographic factors

The employment status of the participants was classified as follows: (i) employed (including full-time (73%) and part-time employment (22%), entrepreneurs (4%) and traders or freelancers (1%)); (ii) early retirees (disability-based (40%) and non-disability-based retirement (60%)); and (iii) other non-employed. Most survivors in the last group were unemployed (44%) or in subsidized work (i.e. the employer has been granted subsidy for the employment of an unemployed jobseeker, 31%), but some were homemakers (11%), students or others (14%).

We elicited information concerning marital status (single, married, cohabiting or other), education and current or latest occupation. The participants were classified into three educational categories as follows: comprehensive school (approximate length: 1–9 years), secondary/vocational school (10–12 years) and college or university (over 12 years). Occupation was coded according to the International Standard Classification of Occupations (ISCO-88) and categorized into two statuses: white-collar and blue-collar workers. Forty per cent of the cancer survivors were Finnish, 29% Danish, 19% Norwegian, and 12% Icelandic. Because of their small number, Icelanders were combined with the Norwegians in the analyses.

Disease-related factors, co-morbidity and symptoms

Information on diagnosis, date of diagnosis, and treatment were obtained from the hospital or registry files. Treatment was classified into two categories: chemotherapy or other treatment; no information was obtained on other types of treatments. Both taxanes and adjuvant treatment with trastuzumab were in use during the study period in Nordic countries. In the questionnaire, the participants

were asked to mark on a list their current chronic diseases or injuries diagnosed by a physician. The list included injury or accident, musculoskeletal disease, cardiovascular disease, respiratory disease, mental disorder, neurological or sensory diseases, digestive disease, genitourinary disease, skin disease, endocrine and metabolic diseases, blood diseases or other disorders or diseases [11].

Pain was assessed using a question from the Short Form-12 General Health Survey, which asked to what extent pain had interfered with participants' normal work in the past 4 weeks (including both work outside the home and housework) [12]. Pain was categorized into two classes: none or a little, and moderate or a lot. Experiencing fatigue was categorized into never or seldom, and often or all the time.

Anxiety and depression

We assessed anxiety and depression using the Hospital Anxiety and Depression Scale [13]. This scale is widely used in screening and surveys and has proved reliable in the assessment of symptom severity and in finding cases of anxiety disorders and depression among somatic, psychiatric and primary care patients as well as among the general population [14]. The following three categories were used for anxiety (no anxiety, possible case of anxiety and probable case of anxiety) and two categories for depression because of small numbers (no depression and possible or probable case of depression).

Physical and mental quality of life

We assessed health-related quality of life using the Short Form-12 General Health Survey [12], which is a widely used, well-validated health measure describing functional status and well-being and can be used for comparing large groups [15]. It includes eight domains: physical functioning, role limitations due to physical health problems, bodily pain, general health, vitality, social functioning, role limitations due to emotional health problems, and mental health. These can be summarized in a physical and mental component summary [16]. We divided the two component scores into tertiles as follows: <40 (lowest quality of life), $40–<50$ and ≥50 (highest quality of life).

Social support from work

The measurement of received social support was based on the Structural–Functional Social Support Scale, which has been developed for measuring disease-specific support received from different sources by people with a serious somatic disorder or chronic disease [17]. We asked the participants to evaluate how much support they had received from co-workers and supervisors at their first workplace after cancer diagnosis. Received support was

measured with four items from each source. The items were selected on the basis of the issues that came up at the interviews of 26 Finnish cancer survivors in a qualitative pilot study on work-related experiences. The items covered emotional support at work (contact while ill and showing compassion and understanding) and practical support (e.g. giving good advice, taking the illness into consideration when planning work tasks, and evaluating working conditions to facilitate coping at work). The scale of support ranged from 1 (not at all) to 5 (very much) for all the questions. We summed up the values of the four items and divided the sum by four to obtain the means of support. Cronbach's alphas were $\alpha = 0.85$ for supervisor's support and $\alpha = 0.83$ for colleagues support. We classified the means into three categories: weak (1–2.1), moderate (2.2–3.4) and strong (≥3.5) support.

Statistical analyses

We used multinomial logistic regression models to analyse the association of various determinants with employment status. We compared survivors who had retired early or who were not employed because of other reasons with survivors who were employed. First, we calculated unadjusted odds ratios (ORs) and their 95% CI for different risk factors of early retirement and non-employment for other reasons. Second, we included age, education, country and co-morbidity in a baseline multivariate model. Marital status, chemotherapy and year of diagnosis were excluded from further analyses, because their association with employment status was weak. Data on occupation were missing more often from the non-employed participants than those from the employed participants, and therefore, they were also excluded from the further analyses. Third, we included in the baseline model workplace support, and symptoms and mental diseases (pain, fatigue, anxiety and depression). Quality of life was not included in this model because it includes items on pain and mental health. Finally, we separately included quality of life in the multivariate baseline model. In sensitivity analysis, we examined whether associations differed across subgroups of disability-based and non-disability-based retirees.

All statistical analyses were performed using the SAS statistical programme package, version 9.1 [18].

Results

Eighty-two per cent ($N = 914$) of the breast cancer survivors employed at the time of diagnosis (in total 1111) were still employed at the time of the survey, 11% ($N = 122$) had retired early, and 7% were ($N = 75$) non-employed because of other reasons. Nearly half of the survivors were under 55 years old, 41% had undergone chemotherapy, and 74% were white-collar workers.

About 54% of the survivors reported having another chronic disease diagnosed by a physician (Table 1).

First, we investigated whether sociodemographic and health-related factors were associated with early retirement and other non-employment (Table 2). High age, low education, country and co-morbidity were related to early retirement. Except for age, these factors were also related to non-employment due to other reasons. Risks of early retirement and other non-employment were higher among blue-collar workers than those among white-collar workers.

Second, we included social support received at the workplace after diagnosis as well as pain, anxiety, depression and fatigue in the multivariate model. Altogether, 28% of the breast cancer survivors reported having received weak support from their supervisor, and 16% reported weak support from their colleagues. Weak support from colleagues after the diagnosis predicted early retirement among survivors, whereas weak support from one's supervisor predicted non-employment due to other reasons (Table 3).

Early retired survivors reported pain more often (48%) than other non-employed (35%) or employed (17%) survivors. After adjusting for other variables, pain was related to both outcomes, although more strongly to early

Table 1. Characteristics of breast cancer survivors (N = 1111)

Characteristic	Number	%
Age (years)		
<55	533	48
55–59	390	35
60–64	188	17
Treatment		
Chemotherapy	448	41
Other	652	59
Year of diagnosis		
1997–1999	583	52
2000–2002	528	48
Country		
Denmark	327	29
Finland	444	40
Iceland	133	12
Norway	207	19
Marital status		
Married or cohabiting	807	74
Other	289	26
Education		
Comprehensive school	244	22
Secondary/vocational school	329	30
College or university degree	532	48
Occupational status		
Blue-collar workers	280	26
White-collar workers	789	74
Number of other chronic diseases or injuries		
None	505	46
1	381	35
≥2	202	19

retirement (Table 3). Using Hospital Anxiety and Depression Scale, 28% of the survivors were classified as possible, and 12% as probable cases of anxiety; 11% were classified as possible or probable cases of depression. Depression was weakly associated with early retirement (adjusted *OR*: 2.32, 95% CI: 0.96–5.62). Among the other non-employed, crude ORs for anxiety and depression were increased, but the risk estimates decreased after adjusting for other factors. Twenty-seven per cent of survivors experienced fatigue often or all the time, and it was related to other non-employment. Depression, anxiety and fatigue correlated strongly with each other. When only one of them at a time was included in the multivariate model, the OR for anxiety remained increased among the other non-employed survivors (*OR*: 2.19, 95% CI: 1.07–4.49).

Finally, we compared health-related quality of life among the employed, early retired and other non-employed survivors. More than half of the early retired survivors (59%) and 39% of the other non-employed survivors rated their physical quality of life as low, whereas among the employed survivors, this proportion was 19%. After adjustment for age, country, education and co-morbidity, low physical quality of life was strongly associated with early retirement, but it was also associated with non-employment due to other reasons (Table 4). The proportion of survivors with the lowest mental quality of life score was higher among the other non-employed survivors (31%) than that among the employed (23%) or early retired (17%) survivors. Low mental quality of life was related to other non-employment after adjusting for other factors.

Sensitivity analyses were performed in two subgroups to separately examine the association of various factors with disability-based (N = 73) and non-disability-based (N = 49) early retirement. The association of various factors was mainly similar in both groups. However, co-morbidity, pain and poor physical quality of life were more strongly related to disability-based than non-disability-based retirement, whereas low education was more strongly related to non-disability-based retirement.

Discussion

We investigated the correlates of early retirement and other non-employment among working-aged breast cancer survivors who were employed at the time of diagnosis and who had been treated with curative intent. We observed that low education, blue-collar work and co-morbidity were associated with early retirement and being non-employed for other reasons. The findings on early retirement are in line with other studies among breast cancer survivors [8,5]. An earlier study indicated vocational education as a risk factor of unemployment among cancer survivors [6]. Long-term illnesses, ill health and low

Table 2. Association of sociodemographic and health-related factors with early retirement and other non-employment

| | Univariate models | | | | Multivariate model | | | |
| | Retired early | | Other non-employed | | Retired early | | Other non-employed | |
Characteristics	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age (years)								
<55	1.00		1.00		1.00		1.00	
55–59	1.99	1.05–3.75	0.97	0.59–1.59	1.63	0.84–3.14	0.85	0.51–1.43
60–63	21.93	12.47–38.57	0.44	0.15–1.25	16.46	9.00–30.11	0.37	0.13–1.08
Treatment								
Other	1.00		1.00					
Chemotherapy	1.34	0.90–2.00	1.13	0.70–1.84				
Year of diagnosis								
1997–1999	1.00		1.00					
2000–2002	0.75	0.51–1.10	1.11	0.69–1.77				
Number of other chronic diseases								
None	1.00		1.00		1.00		1.00	
1	2.54	1.53–4.22	2.11	1.24–3.59	2.18	1.22–3.90	2.16	1.24–3.74
≥2	6.68	4.02–11.10	1.87	0.95–3.70	6.23	3.40–11.44	1.91	0.95–3.85
Country								
Finland	1.00		1.00		1.00		1.00	
Denmark	6.36	3.82–10.61	1.84	1.09–3.10	2.98	1.64–5.41	1.88	1.10–3.21
Norway and Iceland	1.61	0.89–2.91	0.50	0.25–1.00	1.31	0.66–2.59	0.47	0.22–0.99
Marital status								
Married or cohabiting	1.00		1.00					
Other	1.21	0.80–1.85	1.53	0.93–2.54				
Education								
College or university degree	1.00		1.00		1.00		1.00	
Secondary/vocational school	1.68	1.05–2.70	0.87	0.47–1.59	1.87	1.06–3.31	1.03	0.55–1.93
Comprehensive school	3.21	2.02–5.10	1.93	1.11–3.35	3.32	1.87–5.90	1.85	1.04–3.27
Occupational status								
White collar	1.00		1.00					
Blue collar	2.56	1.72–3.81	1.81	1.07–3.04				

education have also been related to early retirement and unemployment in the general population [19–21]. Contrary to the results of a Danish study [8], we found no clear association between having undergone chemotherapy and the risk of taking early retirement. Another study also indicated that chemotherapy did not affect employment 3 years after breast cancer [22]. Endocrine therapy was related to stopping to work because of side effects of breast cancer or its treatment in one study [23]. We had no information on treatment with endocrine therapy, and thus, we cannot exclude the possibility that endocrine therapy may have affected the likelihood of leaving the workforce.

Danish participants retired early and were more often non-employed because of other reasons than those from other Nordic countries, whereas the combined group of Icelandic and Norwegian survivors seemed to be non-employed less often than the Finnish participants. A likely explanation for these differences between countries is differences in their pension schemes and social security systems [24].

Support at work

The importance of workplace support for cancer survivors' return to work has been indicated by several studies

[25–29]. We found that weak support from co-workers after diagnosis predicted early retirement among breast cancer survivors, whereas weak support from one's supervisor predicted non-employment due to other reasons. Low social support from the workplace has also been related to an increased risk of disability pension in the general population [30,31]. In one study, the association between low supervisor support and disability pension was strongly attenuated after adjusting for health status [32]. In our data, however, the associations remained after adjustment for co-morbidity.

Pain, depression, anxiety and fatigue

Pain was strongly associated with early retirement and less strongly with other non-employment. Chronic pain has also shown a strong association with disability retirement in the general population [33,34]. Depression is a known reason for disability pension and was also related to early retirement in our data. Anxiety and fatigue were more common among the other non-employed survivors than those among the employed survivors. Other studies have also indicated that symptoms of anxiety and/or affective disorders are stronger among unemployed people than those among employed

Table 3. Association of support from the workplace, anxiety, depression, pain and fatigue with early retirement and other non-employment

| | | Univariate models | | | | Multivariate model[b] | | | |
| | Number of survivors[a] | Retired early | | Other non-employed | | Retired early | | Other non-employed | |
Workplace support		OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Support from the supervisor									
High	379	1.00		1.00		1.00		1.00	
Moderate	374	0.82	0.51–1.33	0.99	0.52–1.91	0.71	0.33–1.52	0.95	0.43–2.08
Weak	287	0.94	0.57–1.57	2.04	1.11–3.73	0.48	0.19–1.21	2.51	1.10–5.72
Support from the colleagues									
High	463	1.00		1.00		1.00		1.00	
Moderate	406	0.76	0.47–1.23	1.42	0.82–2.48	1.45	0.68–3.07	1.20	0.59–2.43
Weak	166	2.21	1.34–3.64	1.60	0.78–3.30	3.70	1.49–9.19	0.74	0.29–1.91
Anxiety									
No	669	1.00		1.00		1.00		1.00	
Possible case	305	1.05	0.68–1.62	1.14	0.64–2.02	0.68	0.34–1.35	0.81	0.40–1.62
Probable case	127	1.24	0.68–2.26	2.90	1.59–5.31	0.58	0.19–1.74	1.73	0.76–3.94
Depression									
No	987	1.00		1.00		1.00		1.00	
Possible or probable	117	2.56	1.55–4.24	2.21	1.16–4.19	2.32	0.96–5.62	1.07	0.45–2.59
Pain									
None/a little	867	1.00		1.00		1.00		1.00	
Moderate/a lot	238	4.41	2.96–6.56	2.59	1.56–4.29	9.08	4.17–19.74	1.96	1.03–3.71
Fatigue									
Never/seldom	803	1.00		1.00		1.00		1.00	
Often	287	1.63	1.08–2.46	1.78	1.08–2.92	0.90	0.45–1.79	1.97	1.03–3.78

[a]Sum of employed, retired and non-employed survivors.
[b]Model includes age, country, education and co-morbidity (without mental disorders).

Table 4. Association of physical and mental quality of life with early retirement and other non-employment

| | | Univariate models | | | | Multivariate model[b] | | | |
| | Number of survivors[a] | Retired early | | Other non-employed | | Retired early | | Other non-employed | |
Quality of life		OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Physical quality of life									
≥50 (high)	611	1.00		1.00		1.00		1.00	
40–<50	202	1.18	0.61–2.29	1.19	0.60–2.38	1.38	0.62–3.09	1.10	0.53–2.31
<40 (low)	263	6.40	4.09–10.02	2.94	1.71–5.04	10.46	5.46–20.04	2.65	1.44–4.89
Mental quality of life									
≥50 (high)	619	1.00		1.00		1.00		1.00	
40–<50	254	1.01	0.62–1.66	2.08	1.16–3.74	1.08	0.56–2.07	1.88	1.02–3.48
<40 (low)	203	1.41	0.86–2.30	2.78	1.54–5.02	1.05	0.55–2.03	2.40	1.28–4.50

[a]Sum of employed, retired and non-employed survivors.
[b]Model includes age, country, education and co-morbidity.

people [35]. Poor mental health may be the consequence of unemployment, but it may also increase the probability of unemployment.

Quality of life

Many studies have reported long-term breast cancer survivors' good overall quality of life [36], but very few studies have examined their quality of life by employment status. Not surprisingly, breast cancer survivors who retired early had lower physical quality of life than employed survivors. Other non-employed survivors had not only lower physical but also lower mental quality of life. In line with our results, a greater increase in physical well-being was associated with being employed among young breast cancer survivors 5 years after diagnosis [37]. Another study indicated that women who stopped working after breast cancer diagnosis had lower physical and functional well-being than those who were working at 8 months post-diagnosis [38]. In the general population, unemployed individuals have been observed as having lower psychological and physical well-being than their employed counterparts [39].

Strengths and limitations

The strengths of our study include the use of validated tools in the assessment of social support, depression, anxiety and quality of life, and the moderate response rate. A limitation is the cross-sectional design. In addition, we were able to separately analyse only two groups, early pensioners and other non-employed participants, because of the small sample size. Sensitivity analyses indicated, however, that the association of various factors was mainly similar to disability-based and non-disability-based retirement. Finally, we cannot rule out potential interactions between workplace support, pain, depression anxiety, fatigue, quality of life and employment status, but the small number of retired and other non-employed survivors limits our possibilities to evaluate these interactions.

Conclusions

We found not only some similarities in the factors associated with different employment status groups but also discrepancies. Low education, experiences of pain, low physical quality of life and co-morbidity were more common among both the early retired and other non-employed survivors than those among employed breast cancer survivors. The association of these factors with work participation was, however, stronger in the early retired group. This illustrates the differences in pathways out of active employment: Ill health is the strongest predictor of early retirement, whereas other non-employment is affected by a combination of reduced health and other factors related to work and society.

Other non-employed breast cancer survivors had the lowest mental quality of life and also experienced fatigue and anxiety more often than the employed survivors.

Moreover, both the early retired and other non-employed survivors perceived that they had received lower workplace support than the employed survivors. Differences in ill health and functional status between the various groups of non-employed cancer survivors need to be considered when planning vocational rehabilitation programmes and policy measures for improving the labour market participation of this population. The main aim is to prevent early retirement and other non-employment of cancer survivors. The results also highlight the importance of finding ways in which to involve employers, as they seem to play an important role in job retention.

Acknowledgements

Conflict of interest

The authors declare that they have no conflicts of interest.

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