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## Sustained employability and health-related quality of life in cancer survivors up to four years after diagnosis

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### ABSTRACT

**Background:** Most cancer survivors are able to return to work at some point after diagnosis. However, literature on sustained employability and health-related quality of life (HRQoL) is limited. Therefore, the aims of this study were to explore the influence of change in employment status on HRQoL in cancer survivors long term after diagnosis, and to identify predictors of work continuation in occupationally active survivors.

**Material and methods:** We used prospective data (T0 = two years after diagnosis, T1 = one-year follow-up, and T2 = two-year follow-up) from a cohort of cancer survivors that had an employment contract and were of working age at T0 (N = 252, 69.8% female). Groups were formed on the basis of change in employment status: 'continuously not working' (19.8%), 'positive change in employment status' (5.6%), 'negative change in employment status' (14.7%), and 'continuously working' (59.9%). ANCOVA was used to explore the relationship between change in employment status and HRQoL at T1. Generalized estimating equations (GEE) were used to identify predictors of work continuation (at T1 and T2) in survivors that were occupationally active at T0 (N = 212).

**Results:** 'Continuously working' survivors scored significantly better on the EORTC QLQ-C30 scales: role functioning, fatigue, pain, constipation, global health/QoL and the Summary score, than 'continuously not working' survivors, and better on physical, role and emotional functioning, fatigue, financial impact, global health/QoL and the Summary score than survivors with a 'negative change in employment status' (effect size range = 0.49–0.74). In occupationally active survivors, a high score on current work ability was associated with work continuation one year later [odds ratio (OR) 1.46; 95% CI 1.11–1.92].

**Conclusion:** Cancer survivors 'continuously working' function better and have a better health and QoL than those who are not able to work. However, in occupationally active cancer survivors, one should monitor those with low self-perceived work ability, because they have an increased risk to discontinue their work.

### ARTICLE HISTORY

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Being employed is beneficial for our wellbeing and health-related quality of life (HRQoL) [1,2]. Therefore, a main goal of the European Union is to have 75% of the 20–64 year olds employed by 2020 [3], with a focus on sustained employability. Many positive health effects and material benefits of paid work have been reported (e.g., the ability to take care of oneself, the opportunity to increase skills, access to social support and networks, and having a meaningful purpose in life) [4,5]. Adverse health effects of employment also exist and may, for example, be caused by heavy physical work, high noise levels, or (mental) stressors [6]. In addition, leaving the workforce (involuntary) can negatively affect mental and physical health, cause high levels of depression and anxiety, deteriorate self-rated health and increase mortality risk [7,8]. When confronted with a debilitating illness, such as depression or cancer, the ability to work is likely to be affected and changes in employment status, such as job loss, often occur [9].

In Europe, 3.5 million persons are newly diagnosed with cancer each year [10]. In the Netherlands, the incidence was about 105 000 in 2015 [11], and it is expected that the number of persons living with the long-term consequences of diagnosis and treatment will increase up to 666 000 in 2020 [12]. In Western societies, between 40% and 50% of the patients are of working age at time of diagnosis [13]. Most of them are highly motivated to return to work (RTW), after a period of sick leave, or even to continue working during treatment [14], as they perceive employment participation as a sign of recovery, and a vital aspect of reestablishing normality, self-concept and HRQoL [15,16]. Fortunately, about 62% of these cancer survivors are able to RTW within 12 months after diagnosis [17]. Although many studies related to cancer survivors' working life have been conducted within a relatively short time frame after diagnosis (i.e., within the first two years), information about changes in employment status of survivors several years after diagnosis is scarce.

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Recently, one study reported on adverse employment outcomes in breast cancer survivors, up to 10 years after diagnosis [18]. However, to date, the influence of changes in employment status on HRQoL in cancer survivors, long term after diagnosis, is not well quantified and understood, and should therefore be explored.

Further, while sustained employability in cancer survivors is growing, i.e., most are in fact able to RTW and thus are occupationally active again after treatment, many of them still experience problems and reduced HRQoL after reentering the workplace (e.g., cognitive limitations, fatigue and treatment-induced menopausal symptoms) [19]. To support cancer survivors in vocational rehabilitation, factors have been identified that facilitate re-integration in the workplace, such as younger age, male gender, higher level of education, but also perceived employer accommodation [17]. However, given the increasing number of occupationally active survivors, and the identified problems they experience while at work, factors that enable them to continue working should be identified as well.

Therefore, the objectives of this study were: (1) to explore the influence of change in employment status over a 12-month period on HRQoL in cancer survivors long term after diagnosis; and (2) to identify predictors of work continuation in occupationally active survivors.

## Material and methods

### Study population and procedure

We used prospective data from a cohort of Dutch cancer survivors at two years after diagnosis, who were monitored up to four years after diagnosis. Survivors were included between July 2011 and February 2012. A detailed description of the study has been published previously [20]. The study was approved by the Medical Ethics Committee of the VU University Medical Center.

In short, cancer survivors were identified for the original cohort, from the registries at the Social Security Agency (SSA), based on a weekly obtained list of social security numbers and attached medical records. The SSA is responsible for the assessment of work disability of Dutch workers on long-term sick leave. Potentially eligible participants received a package that included an information flyer, a baseline questionnaire (T0), and an informed consent form at their home address. A reminder was sent after two weeks, and follow-up questionnaires one year (T1) after the baseline package. A two-year follow-up (T2) questionnaire was sent to those survivors that were occupationally active at baseline. For the current study, a subset of participants was selected ( $N = 252$ ), who had an employment contract, were between 18 and 64 years old, and had a confirmed diagnosis of cancer. Cancer survivors were excluded if they were still receiving chemotherapy and/or radiotherapy, were self-employed, were working in a sheltered workplace, or were permanently and fully disabled for work. Survivors were also excluded if they were registered as so-called 'social security safety netters', i.e., workers whose temporary employment contract ended

during sick leave, temporary agency workers and workers without an employment contract.

### Measures

HRQoL was measured using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30) [21]. This questionnaire consists of five functional scales (i.e., physical, role, emotional, cognitive and social), nine symptom scales (i.e., fatigue, pain, nausea and vomiting, dyspnea, insomnia, appetite loss, constipation, diarrhea and financial impact), and a two-item global health/QoL scale, all ranging from 0 to 100. A higher score on the functional and the global health/QoL scales indicates better HRQoL. A higher score on the symptom scales indicates a higher level of symptom burden. The QLQ-C30 Summary score was generated, calculated as the mean of all combined scale scores, excluding financial impact and the global health/QoL scale [22].

Physical limitations were measured using the 45-item physical dimension score of the Sickness Impact Profile (SIP) [23]. All items are scored dichotomously. A higher score indicates more limitations (range 0–100). Fatigue was measured, using the 13-item Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) [24]. Items are scored on a five-point scale. A higher score indicates less fatigue (range 0–52). Depression was measured using the 20-item Center for Epidemiologic Studies Depression Scale (CES-D) [25]. Items are scored on a four-point scale. A higher score indicates more depressive symptoms (range 0–60). Coping was measured using the 47-item Utrecht Coping List (UCL) [26], covering seven coping strategies. Items are scored on a four-point scale. A higher score indicates an increased tendency towards using that specific coping strategy (different range per strategy). Current work ability compared to life time best was scored from 0 = cannot work at all to 10 = best ever, using the first item of the Work Ability Index (WAI) [27]. Physical workload (seven items) and need for recovery (11 items) were measured using the Dutch questionnaire on Experience and Judgement of Work (VBBA) [28]. Higher scores on these scales indicate a higher level of physical work (range 0–100) and a stronger need for recovery (range 0–100), respectively. Supervisor and coworker social support were measured using two subscales (four items each) of the Job Content Questionnaire (JCQ) [29]. Items are scored on a four-point scale. A higher score indicates a higher level of support (range 4–16).

### Statistical analyses

Analysis of variance and  $\chi^2$ -tests were used to describe baseline socio-demographic characteristics (i.e., age, gender, marital status and educational level), health characteristics (i.e., tumor type, treatment modalities, being free of disease and comorbidity), and work-related characteristics at time of diagnosis (i.e., type of job, working hours per week, shift work, managerial tasks and work demands).

ANCOVA models were applied to explore the relationship between change in employment status and HRQoL in cancer survivors, long term after diagnosis. Change in employment status, between T0 and T1, was categorized in four groups: (1) 'continuously not working', meaning not (therapeutically) working at T0 and T1; (2) 'positive change in employment status', meaning not (therapeutically) working at T0 and (therapeutically) working at T1; (3) 'negative change in employment status', meaning (therapeutically) working at T0 and not (therapeutically) working at T1; and 4) 'continuously working', meaning (therapeutically) working at T0 and T1. Therapeutic work involves, for example, a gradual build-up of workload and working hours. These models were adjusted for identified and relevant baseline differences between the four groups ( $p < 0.10$ ) and the baseline value of the outcome measure. Post hoc analyses were applied with sidak correction. A p-value of 0.05 was considered statistically significant. Significant differences in adjusted mean scores between groups were accompanied by standardized effect sizes (ES), which were calculated by dividing the mean difference by the pooled standard deviation. ES of 0.2 were considered small, 0.5 moderate and 0.8 large [30]. An ES of 0.5 is considered to be clinically relevant [31].

In addition, generalized estimating equations (GEE) with exchangeable working correlation structure were used to determine which characteristics predict work continuation in a population of occupationally active cancer survivors [32]. In these analyses, only those survivors were included who were working at T0 and who had at least one follow-up measurement. Work continuation was defined as (therapeutically) working (yes; no). In the GEE models, treatment modalities, being free of disease, comorbidity, but also the measures EORTC QLQ-C30, SIP, FACIT-F, CES-D, UCL, WAI, VBBA and JCQ were time dependent. A time lag model was applied, where measurements of the predictors were related to work continuation one year later, thus relating baseline predictors to work continuation at T1, and predictors at T1 to work continuation at T2 [33]. Univariate analyses with  $p < 0.10$  were conducted, to select possible predictors. Continued selection on the remaining predictors from the univariate analyses were based on multi-collinearity and accepted in the multivariate GEE analyses if correlation coefficients were  $\geq -0.7$  and  $\leq 0.7$  [34]. For the multivariate GEE analyses, a p-value of 0.05 was considered statistically significant. SPSS 22.0 was applied to conduct all analyses [35].

## Results

### *Change in employment status and health-related quality of life*

Of the 484 participants in the original prospective cohort study, 252 cancer survivors were eligible for the first part of this study (Figure 1). The mean age was 50.7 (SD 7.4), 69.8% was female, 79.4% was married or living with a partner, and 61.1% had an educational level of at least vocational or upper secondary school. Nearly half of the survivors (48.0%) had been diagnosed with breast cancer, 73.0% had been treated with chemotherapy, and 50.8% reported to be

disease-free at time of baseline questionnaire completion. Regarding the change in employment status, 19.8% was 'continuously not working', 5.6% experienced a 'positive change in employment status', 14.7% a 'negative change in employment status' and 59.9% was 'continuously working'. We found baseline differences ( $p < 0.10$ ) for education, tumor type, hormonal therapy, working hours per week and work demands. All models were adjusted for these possible confounders, and for the baseline outcome measure, and age and gender (Table 1).

At T0, overall significant differences ( $p < 0.05$ ) were found between the four groups on all scales of the QLQ-C30 (except for nausea and vomiting) and the Summary score. Most differences were seen between survivors 'continuously working' and those 'continuously not working', and between survivors 'continuously working' and those who experienced a 'negative change in employment status', favoring the 'continuously working' group at all times (Table 2).

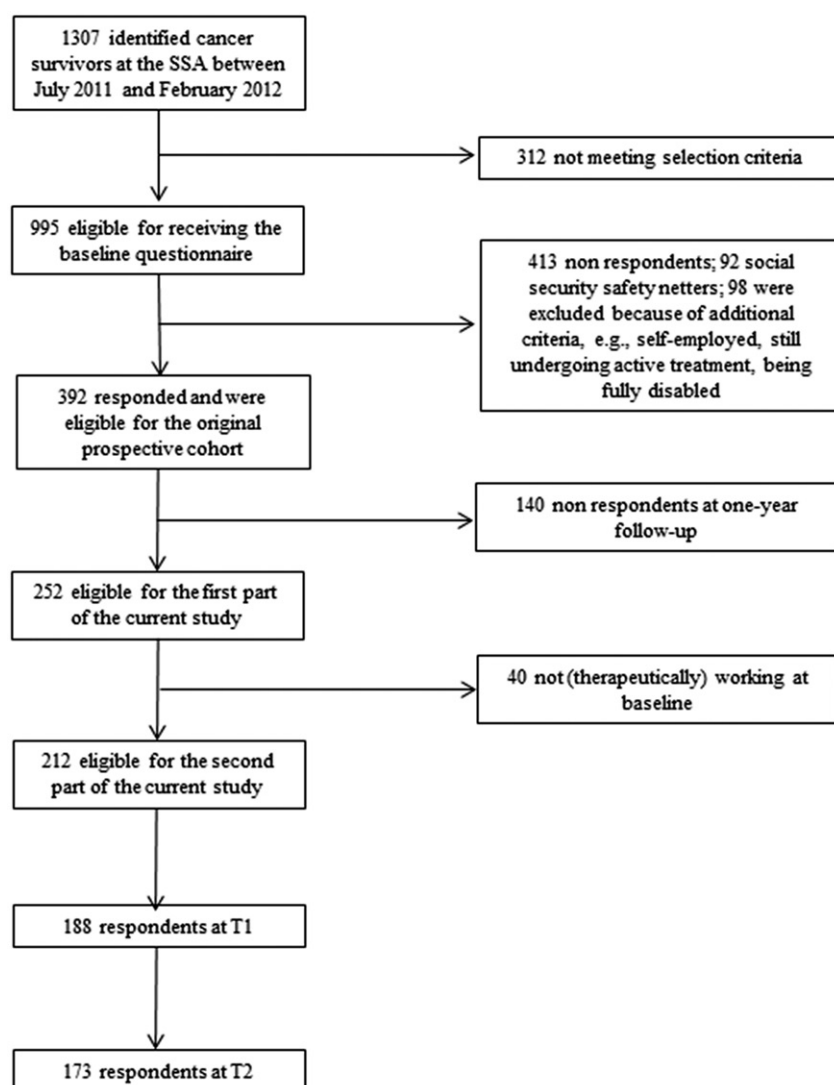
At T1 (Table 2), survivors 'continuously working' showed higher role functioning ( $p = 0.003$ ; ES = 0.61), less fatigue ( $p = 0.024$ ; ES = -0.50), pain ( $p < 0.001$ ; ES = -0.74), and constipation ( $p = 0.022$ ; ES = 0.49), better global health/QoL ( $p = 0.001$ ; ES = 0.66), and a higher Summary score ( $p = 0.002$ ; ES = 0.72), than survivors 'continuously not working'. They also showed higher physical ( $p = 0.042$ ; ES = 0.49), role ( $p = 0.024$ ; ES = 0.54), and emotional functioning ( $p = 0.010$ ; ES = 0.59), less fatigue ( $p = 0.045$ ; ES = -0.51) and financial impact ( $p = 0.001$ ; ES = -0.74), better global health/QoL ( $p = 0.013$ ; ES = -0.60) and a higher Summary score ( $p = 0.026$ ; ES = -0.63), than survivors with a 'negative change in employment status'. Additionally, survivors with a 'positive change in employment status' showed less appetite loss than survivors 'continuously not working' ( $p = 0.012$ ; ES = -0.94), and survivors with a 'negative change in employment status' ( $p = 0.005$ ; ES = -1.08).

It is noteworthy that the 'positive change in employment status' group reported the best scores on physical, role, cognitive and social functioning, nausea and vomiting, appetite loss, constipation, global health/QoL and Summary score. Conversely, the 'negative change in employment status' group reported the worst scores on physical, emotional and social functioning, fatigue, dyspnea, appetite loss and financial impact (Table 2).

### *Predictors of work continuation in occupationally active cancer survivors*

For the second part of the current study, 212 cancer survivors who were occupationally active at baseline were eligible (Figure 1). Socio-demographics, health- and work-related characteristics of these survivors were comparable to the characteristics of the total study population, as described above. In total, 188 survivors returned the questionnaire at T1, and 173 at T2.

Univariate GEE analyses, on the variables in Tables 1 and 2, identified 13 predictors on the basis of  $p < 0.10$  (Table 3). These results showed that, in occupationally active cancer survivors, work continuation one year later was associated



**Figure 1.** Flowchart of cancer survivors identified at the Social Security Agency (SSA).

with younger age, high level of education, being diagnosed with breast cancer, being treated with radiotherapy, being treated with hormonal therapy, low physical symptom burden, high levels of physical functioning, global health/QoL, and the Summary score, low level of financial impact, high current work ability, high work ability related to physical work demands, and a low level of need for recovery (Table 3). Multi-collinearity was found between global health/QoL and the Summary score, resulting in 12 remaining predictors to be included in the final model (Table 4). In the multivariate GEE analysis, only high 'current work ability compared to life time best' was found to be significantly associated ( $p=0.007$ ) with work continuation one year later [odds ratio (OR) 1.46; 95% CI 1.11–1.92].

## Discussion

### Main findings

In this study, the influence of change in employment status over a 12-month period on HRQoL in cancer survivors long-term after diagnosis has been explored. Cancer survivors

'continuously working' reported higher levels of functioning, less symptom burden, and an overall better HRQoL, compared to those 'continuously not working', but also compared to those who experienced a 'negative change in employment status'. Most effects were considered clinically relevant ( $ES > 0.5$ ). Furthermore, this study showed that, in occupationally active cancer survivors up to four years after diagnosis, a high score on perceived work ability was positively associated with work continuation one year later.

### Interpretation of the findings

The positive findings in 'continuously working' cancer survivors are in line with previous studies, conducted in the general population, stating that sustained employment enhances wellbeing and health [1,36]. However, one must bear in mind that, especially in cancer survivors, those who do not even consider being occupationally active again, because of a debilitating prognosis and deteriorated health, are obviously less likely to stay employed. This makes the relationship between health and employment complex. In addition, this study indicated that especially cancer survivors who

**Table 1.** Participant characteristics at baseline.

|                                                            | Continuously<br>not working<br>(N = 50) | Positive change in<br>employment status<br>(N = 14) | Negative change in<br>employment status<br>(N = 37) | Continuously<br>working<br>(N = 151) | p-value |
|------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------|-----------------------------------------------------|--------------------------------------|---------|
| <i>Socio-demographics</i>                                  |                                         |                                                     |                                                     |                                      |         |
| Age (years)                                                | Mean (SD)<br>50.6 (8.1)<br>N (%)        | Mean (SD)<br>47.6 (8.8)<br>N (%)                    | Mean (SD)<br>52.1 (8.3)<br>N (%)                    | Mean (SD)<br>50.7 (6.6)<br>N (%)     | 0.273   |
| Gender (male)                                              | 16 (32%)                                | 3 (21%)                                             | 14 (38%)                                            | 43 (29%)                             | 0.613   |
| Marital status                                             |                                         |                                                     |                                                     |                                      | 0.673   |
| Single                                                     | 3 (6%)                                  | 1 (7%)                                              | 6 (17%)                                             | 16 (11%)                             |         |
| Married                                                    | 37 (74%)                                | 10 (71%)                                            | 23 (62%)                                            | 101 (67%)                            |         |
| Living with partner                                        | 4 (8%)                                  | 1 (7%)                                              | 5 (14%)                                             | 19 (13%)                             |         |
| Divorced                                                   | 6 (12%)                                 | 2 (14%)                                             | 3 (8%)                                              | 15 (10%)                             |         |
| Education                                                  |                                         |                                                     |                                                     |                                      | 0.080   |
| None/primary school/lower vocational                       | 17 (34%)                                | 3 (21%)                                             | 10 (27%)                                            | 31 (21%)                             |         |
| Secondary school                                           | 12 (24%)                                | 0 (0%)                                              | 7 (19%)                                             | 18 (12%)                             |         |
| Vocational/upper secondary school                          | 9 (18%)                                 | 5 (36%)                                             | 12 (32%)                                            | 49 (33%)                             |         |
| Upper vocational education/university                      | 12 (24%)                                | 6 (43%)                                             | 8 (22%)                                             | 53 (35%)                             |         |
| <i>Health-related characteristics</i>                      |                                         |                                                     |                                                     |                                      |         |
| Tumor type                                                 | N (%)                                   | N (%)                                               | N (%)                                               | N (%)                                | 0.000   |
| Mamma                                                      | 18 (36%)                                | 4 (29%)                                             | 14 (38%)                                            | 85 (56%)                             |         |
| Urinary tract                                              | 5 (10%)                                 | 1 (7%)                                              | 3 (8%)                                              | 5 (3%)                               |         |
| Urogenital (male)                                          | 0 (0%)                                  | 0 (0%)                                              | 7 (19%)                                             | 1 (1%)                               |         |
| Urogenital (female)                                        | 1 (2%)                                  | 0 (0%)                                              | 1 (3%)                                              | 7 (5%)                               |         |
| Respiratory tract                                          | 5 (10%)                                 | 0 (0%)                                              | 3 (8%)                                              | 5 (3%)                               |         |
| Digestive system                                           | 6 (12%)                                 | 2 (14%)                                             | 5 (14%)                                             | 16 (11%)                             |         |
| Head and neck                                              | 5 (10%)                                 | 0 (0%)                                              | 0 (0%)                                              | 8 (5%)                               |         |
| Hematological                                              | 6 (12%)                                 | 5 (36%)                                             | 3 (8%)                                              | 18 (12%)                             |         |
| Other                                                      | 4 (8%)                                  | 2 (14%)                                             | 1 (3%)                                              | 6 (6%)                               |         |
| Treatment modalities                                       |                                         |                                                     |                                                     |                                      |         |
| Surgery/Yes                                                | 38 (76%)                                | 8 (57%)                                             | 28 (76%)                                            | 115 (76%)                            | 0.471   |
| No                                                         | 12 (24%)                                | 6 (43%)                                             | 9 (24%)                                             | 36 (24%)                             |         |
| Radiotherapy/Yes                                           | 30 (60%)                                | 7 (50%)                                             | 17 (46%)                                            | 98 (65%)                             | 0.162   |
| No                                                         | 20 (40%)                                | 7 (50%)                                             | 20 (54%)                                            | 53 (35%)                             |         |
| Chemotherapy/Yes                                           | 34 (68%)                                | 13 (93%)                                            | 28 (76%)                                            | 109 (72%)                            | 0.305   |
| No                                                         | 16 (32%)                                | 1 (7%)                                              | 9 (24%)                                             | 42 (28%)                             |         |
| Hormonal therapy/Yes                                       | 12 (24%)                                | 3 (21%)                                             | 7 (19%)                                             | 63 (42%)                             | 0.012   |
| No                                                         | 38 (76%)                                | 11 (79%)                                            | 30 (81%)                                            | 88 (58%)                             |         |
| Being free of disease                                      |                                         |                                                     |                                                     |                                      | 0.596   |
| Yes                                                        | 21 (43%)                                | 7 (50%)                                             | 18 (50%)                                            | 82 (55%)                             |         |
| No                                                         | 13 (27%)                                | 4 (29%)                                             | 5 (14%)                                             | 29 (19%)                             |         |
| Don't know                                                 | 15 (31%)                                | 3 (21%)                                             | 13 (36%)                                            | 39 (26%)                             |         |
| Comorbidity                                                |                                         |                                                     |                                                     |                                      |         |
| Yes                                                        | 27 (54%)                                | 8 (57%)                                             | 18 (49%)                                            | 91 (60%)                             | 0.595   |
| No                                                         | 23 (46%)                                | 6 (43%)                                             | 9 (51%)                                             | 60 (40%)                             |         |
| Physical dimension score (SIP; 0-100)                      | Mean (SD)<br>10.9 (9.2)                 | Mean (SD)<br>11.1 (8.3)                             | Mean (SD)<br>4.8 (4.9)                              | Mean (SD)<br>3.2 (4.9)               | 0.000   |
| Fatigue (FACIT-F; 0-52)                                    | 20.6 (10.1)                             | 23.6 (11.5)                                         | 27.6 (9.0)                                          | 31.4 (10.8)                          | 0.000   |
| Depressive mood (CES-D; 0-60)                              | 42.4 (12.6)                             | 18.6 (12.0)                                         | 15.3 (8.2)                                          | 13.6 (10.5)                          | 0.000   |
| Coping (UCL)                                               |                                         |                                                     |                                                     |                                      |         |
| Active tackling (7-28)                                     | 17.0 (3.9)                              | 17.1 (3.0)                                          | 18.3 (4.9)                                          | 18.1 (3.6)                           | 0.253   |
| Palliative reacting (8-32)                                 | 17.9 (3.2)                              | 18.4 (2.6)                                          | 18.7 (3.6)                                          | 18.1 (3.7)                           | 0.724   |
| Avoidance (8-32)                                           | 16.6 (3.6)                              | 17.6 (2.7)                                          | 15.4 (3.9)                                          | 15.8 (2.9)                           | 0.059   |
| Seeking social support (6-24)                              | 12.7 (3.7)                              | 13.6 (3.9)                                          | 12.9 (3.5)                                          | 13.4 (3.3)                           | 0.674   |
| Passive reacting (7-28)                                    | 13.5 (4.1)                              | 13.8 (4.9)                                          | 11.7 (2.6)                                          | 11.3 (3.6)                           | 0.001   |
| Expression of emotions (3-12)                              | 5.9 (2.2)                               | 5.6 (1.4)                                           | 5.4 (1.6)                                           | 5.2 (1.5)                            | 0.078   |
| Reassuring thoughts (5-20)                                 | 12.6 (2.3)                              | 12.1 (2.7)                                          | 12.8 (3.4)                                          | 12.7 (2.7)                           | 0.902   |
| <i>Work-related characteristics – at time of diagnosis</i> |                                         |                                                     |                                                     |                                      |         |
| Type of job                                                | N (%)                                   | N (%)                                               | N (%)                                               | N (%)                                | 0.829   |
| White collar worker                                        | 15 (30%)                                | 5 (35%)                                             | 11 (36%)                                            | 62 (42%)                             |         |
| Blue collar worker                                         | 20 (40%)                                | 6 (43%)                                             | 13 (35%)                                            | 52 (34%)                             |         |
| Health care worker                                         | 15 (30%)                                | 3 (21%)                                             | 11 (30%)                                            | 37 (25%)                             |         |
| Shift work                                                 |                                         |                                                     |                                                     |                                      | 0.819   |
| Yes                                                        | 19 (38%)                                | 6 (43%)                                             | 13 (35%)                                            | 49 (33%)                             |         |
| No                                                         | 31 (62%)                                | 8 (57%)                                             | 24 (65%)                                            | 101 (67%)                            |         |
| Managerial tasks                                           |                                         |                                                     |                                                     |                                      | 0.319   |
| Yes                                                        | 8 (17%)                                 | 1 (7%)                                              | 6 (16%)                                             | 36 (24%)                             |         |
| No                                                         | 40 (83%)                                | 13 (93%)                                            | 31 (84%)                                            | 114 (76%)                            |         |
| Working hours per week (Mean; SD)                          | 29.3 (10.3)                             | 26.8 (11.6)                                         | 30.3 (8.0)                                          | 32.1 (8.0)                           | 0.049   |
| Work demands                                               |                                         |                                                     |                                                     |                                      | 0.098   |
| Physical                                                   | 15 (31%)                                | 2 (14%)                                             | 7 (19%)                                             | 28 (19%)                             |         |
| Psychological                                              | 9 (18%)                                 | 3 (21%)                                             | 9 (24%)                                             | 57 (38%)                             |         |
| Physical and psychological                                 | 25 (51%)                                | 9 (64%)                                             | 21 (57%)                                            | 66 (44%)                             |         |

(continued)

Table 1. Continued.

|                                                    | Continuously not working<br>(N = 50) | Positive change in employment status<br>(N = 14) | Negative change in employment status<br>(N = 37) | Continuously working<br>(N = 151) | p-value |
|----------------------------------------------------|--------------------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------|---------|
| <i>Work-related characteristics – at baseline</i>  | Mean (SD)                            | Mean (SD)                                        | Mean (SD)                                        | Mean (SD)                         |         |
| Work ability (WAI; 0-10)                           |                                      |                                                  |                                                  |                                   |         |
| Current work ability                               | 2.1 (2.5)                            | 2.3 (1.7)                                        | 4.5 (1.8)                                        | 5.6 (1.8)                         | 0.000   |
| Work ability related to physical work demands      | n/a                                  | n/a                                              | 3.2 (0.8)                                        | 3.3 (0.7)                         | 0.362   |
| Work ability related to psychological work demands | n/a                                  | n/a                                              | 3.6 (0.9)                                        | 3.5 (0.7)                         | 0.386   |
| Experience and judgement of work (VBBA; 0-100)     |                                      |                                                  |                                                  |                                   |         |
| Physical workload                                  | n/a                                  | n/a                                              | 41.4 (20.0)                                      | 42.0 (15.4)                       | 0.845   |
| Need for recovery                                  | n/a                                  | n/a                                              | 59.4 (27.6)                                      | 50.7 (30.8)                       | 0.120   |
| Job content (JCQ; 4-16)                            |                                      |                                                  |                                                  |                                   |         |
| Supervisor social support                          | n/a                                  | n/a                                              | 11.5 (2.9)                                       | 12.8 (2.2)                        | 0.618   |
| Coworker social support                            | n/a                                  | n/a                                              | 11.7 (2.9)                                       | 12.8 (1.8)                        | 0.903   |

CES-D: Center for Epidemiologic Studies Depression Scale; FACIT-F: Functional Assessment of Chronic Illness Therapy-Fatigue Scale; JCQ: Job Content Questionnaire; n/a: not applicable; SD: standard deviation; SIP: Sickness Impact Profile; UCL: Utrecht Coping List; VBBA: Dutch questionnaire on Experience and Judgement of Work; WAI: Work Ability Index.

Table 2. Differences in quality of life over time regarding employment status.

|                                        | Continuously not working<br>(N = 50) | Positive change in employment status<br>(N = 14) | Negative change in employment status<br>(N = 37) | Continuously working<br>(N = 151) | p-value <sup>e</sup> |
|----------------------------------------|--------------------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------|----------------------|
| Quality of life (EORTC QLQ-C30; 0-100) | Mean (SD)                            | Mean (SD)                                        | Mean (SD)                                        | Mean (SD)                         |                      |
| Physical functioning                   |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 59.1 (17.5)                          | 65.2 (14.8)                                      | 71.6 (15.6) <sup>a</sup>                         | 79.1 (15.1) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 65.9 (19.5)                          | 78.6 (16.7)                                      | 73.2 (20.5)                                      | 85.0 (13.9) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 75.1 (SE = 2.0)                      | 82.1 (SE = 3.6)                                  | 74.9 (SE = 2.1) <sup>b</sup>                     | 81.4 (SE = 1.1)                   | 0.008                |
| Role functioning                       |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 30.3 (27.9)                          | 40.5 (25.9)                                      | 46.3 (25.5) <sup>a</sup>                         | 59.1 (23.8) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 44.1 (28.5)                          | 64.3 (28.4) <sup>a</sup>                         | 51.9 (27.9) <sup>b</sup>                         | 71.1 (22.9) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 52.5 (SE = 3.5)                      | 68.2 (SE = 6.3)                                  | 54.1 (SE = 4.0) <sup>b</sup>                     | 67.3 (SE = 2.0) <sup>a</sup>      | 0.001                |
| Emotional functioning                  |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 56.2 (28.1)                          | 64.3 (31.4)                                      | 69.4 (23.1)                                      | 68.5 (26.2) <sup>a</sup>          | 0.032                |
| Follow-up (T1)                         | 66.5 (25.7)                          | 69.6 (28.0)                                      | 67.4 (28.1) <sup>b</sup>                         | 78.8 (19.9) <sup>a</sup>          | 0.002                |
| Adjusted follow-up model <sup>d</sup>  | 71.4 (SE = 2.7)                      | 70.1 (SE = 5.1)                                  | 66.0 (SE = 3.2) <sup>b</sup>                     | 77.5 (SE = 1.6)                   | 0.008                |
| Cognitive functioning                  |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 50.0 (30.3)                          | 64.3 (25.2)                                      | 59.0 (26.2)                                      | 66.9 (27.2) <sup>a</sup>          | 0.003                |
| Follow-up (T1)                         | 58.5 (30.6)                          | 77.4 (18.0)                                      | 66.7 (28.7)                                      | 73.5 (25.3) <sup>a</sup>          | 0.005                |
| Adjusted follow-up model <sup>d</sup>  | 64.6 (SE = 3.2)                      | 74.1 (SE = 5.9)                                  | 68.7 (SE = 3.7)                                  | 71.3 (SE = 1.8)                   | 0.273                |
| Social functioning                     |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 43.3 (30.7)                          | 52.4 (22.5)                                      | 62.6 (26.8) <sup>a</sup>                         | 67.1 (26.5) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 63.9 (26.0)                          | 77.4 (20.3)                                      | 67.6 (24.6)                                      | 78.6 (23.0) <sup>a</sup>          | 0.001                |
| Adjusted follow-up model <sup>d</sup>  | 70.7 (SE = 3.1)                      | 79.3 (SE = 5.7)                                  | 66.6 (SE = 3.7)                                  | 76.5 (SE = 1.8)                   | 0.054                |
| Fatigue                                |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 65.1 (23.2)                          | 59.5 (28.1)                                      | 55.2 (23.5)                                      | 47.7 (25.7) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 55.0 (26.5)                          | 48.4 (28.8)                                      | 49.5 (23.5) <sup>b</sup>                         | 35.5 (21.1) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 48.4 (SE = 3.0)                      | 43.4 (SE = 5.6)                                  | 48.7 (SE = 3.5) <sup>b</sup>                     | 38.0 (SE = 1.7) <sup>a</sup>      | 0.007                |
| Pain                                   |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 46.3 (33.6)                          | 39.3 (30.9)                                      | 41.2 (33.2)                                      | 27.4 (28.1) <sup>a</sup>          | 0.001                |
| Follow-up (T1)                         | 45.0 (32.0)                          | 22.6 (27.4) <sup>a</sup>                         | 35.2 (30.5) <sup>b</sup>                         | 20.7 (25.1) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 40.5 (SE = 3.5)                      | 22.7 (SE = 6.6)                                  | 32.7 (SE = 4.2)                                  | 22.4 (SE = 2.0) <sup>a</sup>      | 0.000                |
| Nausea and vomiting                    |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 11.7 (24.1)                          | 11.9 (20.1)                                      | 5.1 (11.1)                                       | 7.1 (16.3)                        | 0.243                |
| Follow-up (T1)                         | 12.2 (22.5)                          | 3.6 (9.6)                                        | 5.9 (14.7)                                       | 4.3 (13.0) <sup>a</sup>           | 0.018                |
| Adjusted follow-up model <sup>d</sup>  | 11.6 (SE = 2.2)                      | -0.2 (SE = 4.1)                                  | 7.9 (SE = 2.6)                                   | 4.5 (SE = 1.2)                    | 0.022                |
| Dyspnea                                |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 35.4 (32.2)                          | 40.5 (35.0) <sup>b</sup>                         | 24.5 (32.1)                                      | 17.9 (23.4) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 29.1 (30.0)                          | 31.0 (38.0)                                      | 32.4 (34.3) <sup>b</sup>                         | 14.5 (22.4) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 23.0 (SE = 3.3)                      | 23.6 (SE = 6.1)                                  | 27.3 (SE = 3.9)                                  | 18.0 (SE = 1.9)                   | 0.153                |
| Insomnia                               |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 58.0 (35.5)                          | 45.2 (36.1)                                      | 42.6 (34.4)                                      | 39.3 (35.6) <sup>a</sup>          | 0.016                |
| Follow-up (T1)                         | 49.0 (36.1)                          | 35.7 (30.6)                                      | 33.3 (28.4)                                      | 29.6 (30.5) <sup>a</sup>          | 0.003                |
| Adjusted follow-up model <sup>d</sup>  | 43.1 (SE = 4.0)                      | 34.8 (SE = 7.4)                                  | 35.5 (SE = 4.7)                                  | 30.4 (SE = 2.3)                   | 0.068                |
| Appetite loss                          |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 19.7 (29.6)                          | 14.3 (21.5)                                      | 18.5 (28.1)                                      | 9.1 (20.0) <sup>a</sup>           | 0.018                |
| Follow-up (T1)                         | 16.7 (30.3)                          | 0.0 (0.0) <sup>a,c</sup>                         | 15.7 (32.0) <sup>b</sup>                         | 5.1 (13.8) <sup>a</sup>           | 0.001                |
| Adjusted follow-up model <sup>d</sup>  | 12.0 (SE = 2.7)                      | -5.5 (SE = 5.0) <sup>a,c</sup>                   | 14.6 (SE = 3.2)                                  | 7.0 (SE = 1.5)                    | 0.003                |
| Constipation                           |                                      |                                                  |                                                  |                                   |                      |
| Baseline (T0)                          | 24.7 (35.5)                          | 25.6 (36.4)                                      | 9.3 (17.1) <sup>a</sup>                          | 10.7 (22.6) <sup>a</sup>          | 0.002                |
| Follow-up (T1)                         | 21.8 (31.6)                          | 10.3 (16.0)                                      | 13.1 (24.9)                                      | 7.4 (16.4) <sup>a</sup>           | 0.001                |
| Adjusted follow-up model <sup>d</sup>  | 18.5 (SE = 3.0)                      | 7.5 (SE = 6.0)                                   | 15.4 (SE = 3.5)                                  | 8.3 (SE = 1.7) <sup>a</sup>       | 0.016                |

(continued)

Table 2. Continued.

|                                        | Continuously not working<br>(N = 50) | Positive change in<br>employment status<br>(N = 14) | Negative change in<br>employment status<br>(N = 37) | Continuously working<br>(N = 151) | p-value <sup>e</sup> |
|----------------------------------------|--------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------|----------------------|
| Quality of life (EORTC QLQ-C30; 0-100) | Mean (SD)                            | Mean (SD)                                           | Mean (SD)                                           | Mean (SD)                         |                      |
| Diarrhea                               |                                      |                                                     |                                                     |                                   |                      |
| Baseline (T0)                          | 12.7 (26.8)                          | 28.6 (43.1) <sup>b</sup>                            | 12.0 (22.8)                                         | 7.9 (19.9)                        | 0.015                |
| Follow-up (T1)                         | 13.3 (26.1)                          | 23.1 (28.5) <sup>b</sup>                            | 14.1 (25.0)                                         | 5.4 (17.5)                        | 0.004                |
| Adjusted follow-up model <sup>d</sup>  | 10.3 (SE = 2.7)                      | 15.0 (SE = 5.5)                                     | 14.4 (SE = 3.3)                                     | 6.5 (SE = 1.6)                    | 0.106                |
| Financial impact                       |                                      |                                                     |                                                     |                                   |                      |
| Baseline (T0)                          | 42.9 (36.6)                          | 31.0 (35.7)                                         | 33.3 (33.8)                                         | 26.0 (31.1) <sup>a</sup>          | 0.020                |
| Follow-up (T1)                         | 34.0 (32.3)                          | 23.8 (30.5)                                         | 43.8 (36.8) <sup>b</sup>                            | 22.0 (28.6)                       | 0.001                |
| Adjusted follow-up model <sup>d</sup>  | 29.4 (SE = 3.8)                      | 27.4 (SE = 7.0)                                     | 42.0 (SE = 4.4) <sup>b</sup>                        | 22.9 (SE = 2.1)                   | 0.002                |
| Global health/QoL                      |                                      |                                                     |                                                     |                                   |                      |
| Baseline (T0)                          | 43.3 (18.9)                          | 54.8 (15.9)                                         | 58.8 (15.9) <sup>a</sup>                            | 64.6 (19.7) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 51.7 (23.1)                          | 70.2 (15.9) <sup>a</sup>                            | 62.0 (19.4)                                         | 74.3 (18.0) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 60.2 (SE = 2.5)                      | 72.5 (SE = 4.5)                                     | 61.4 (SE = 2.9) <sup>b</sup>                        | 71.6 (SE = 1.4) <sup>a</sup>      | 0.000                |
| Summary score                          |                                      |                                                     |                                                     |                                   |                      |
| Baseline (T0)                          | 59.9 (17.4)                          | 65.6 (16.7)                                         | 69.4 (12.4) <sup>a</sup>                            | 75.3 (14.8) <sup>a</sup>          | 0.000                |
| Follow-up (T1)                         | 67.1 (15.0)                          | 77.8 (12.7)                                         | 72.7 (12.0) <sup>b</sup>                            | 82.0 (12.7) <sup>a</sup>          | 0.000                |
| Adjusted follow-up model <sup>d</sup>  | 72.9 (SE = 1.8)                      | 81.2 (SE = 3.5)                                     | 73.9 (SE = 2.1) <sup>b</sup>                        | 80.6 (SE = 0.9) <sup>a</sup>      | 0.001                |

EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30; SD: standard deviation; SE: standard error. <sup>a</sup>Significant difference with group 'Continuously not working' at a level of  $p < 0.05$ ; <sup>b</sup>Significant difference with group 'Continuously working' at a level of  $p < 0.05$ ; <sup>c</sup>Significant difference with group 'Negative change in employment status' at a level of  $p < 0.05$ ; <sup>d</sup>Adjusted for baseline outcome measure, age, gender, education, tumor type, hormonal therapy, working hours per week and work demands; <sup>e</sup>p-Value shows significance of change in employment status at a level of  $p < 0.05$ .

Table 3. Univariate time lag model for selecting predictors of work continuation at follow-up.

|                                               | Work continuation at follow-up |                      |
|-----------------------------------------------|--------------------------------|----------------------|
|                                               | Beta (SE)/OR (95% CI)          | p-value <sup>a</sup> |
| <i>Socio-demographics</i>                     |                                |                      |
| Age                                           | -0.06 (0.03)/0.94 (0.89-1.00)  | 0.031                |
| Education                                     |                                |                      |
| None/primary school/lower vocational          | Ref.                           |                      |
| Upper vocational education/university         | 0.75 (0.41)/2.11 (0.94-4.75)   | 0.072                |
| <i>Health-related characteristics</i>         |                                |                      |
| Tumor type                                    |                                |                      |
| Mamma                                         | Ref.                           |                      |
| Urinary tract                                 | -1.29 (0.72)/0.28 (0.07-1.12)  | 0.071                |
| Urogenital (male)                             | -3.68 (1.10)/0.03 (0.00-0.22)  | 0.001                |
| Respiratory tract                             | -1.34 (0.72)/0.26 (0.06-1.07)  | 0.063                |
| Treatment modalities                          |                                |                      |
| Radiotherapy/No                               | Ref.                           |                      |
| Yes                                           | 0.57 (0.26)/1.77 (1.07-2.93)   | 0.028                |
| Hormonal therapy/No                           | Ref.                           |                      |
| Yes                                           | 1.12 (0.41)/3.06 (1.37-6.81)   | 0.006                |
| Physical dimension score (SIP)                | -0.05 (0.02)/0.96 (0.92-0.99)  | 0.023                |
| Quality of life (EORTC QLQ-C30)               |                                |                      |
| Global health/QoL                             | 0.01 (0.01)/1.01 (1.00-1.02)   | 0.065                |
| Physical functioning                          | 0.03 (0.01)/1.03 (1.01-1.04)   | 0.007                |
| Financial impact                              | -0.01 (0.01)/0.99 (0.98-1.00)  | 0.062                |
| Summary score                                 | 0.02 (0.01)/1.02 (1.00-1.04)   | 0.059                |
| <i>Work-related characteristics</i>           |                                |                      |
| Work ability (WAI)                            |                                |                      |
| Current work ability                          | 0.23 (0.06)/1.26 (1.12-1.43)   | 0.000                |
| Work ability related to physical work demands | 0.43 (0.20)/1.53 (1.03-2.27)   | 0.035                |
| Experience and judgement of work (VBBA)       |                                |                      |
| Need for recovery                             | -0.01 (0.01)/0.99 (0.98-1.00)  | 0.018                |

EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30; OR: odds ratio; Ref.: reference category; SE: standard error; SIP: Sickness Impact Profile; VBBA: Dutch questionnaire on Experience and Judgement of Work; WAI: Work Ability Index.

<sup>a</sup>For the univariate generalized estimating equations analyses, a cutoff for p-values of 0.10 was used.

experienced a 'positive change in employment status' reported extensive improvements in functioning, symptom burden and HRQoL, whereas survivors who experienced a 'negative change in employment status' reported the worst scores on several outcomes. Preceding studies described similar effects of such transitions in employment status. That is, among persons who re-enter paid employment, extensive improvement is seen in self-rated health and QoL, while

becoming unemployed is related to worsening physical and mental health [2,8,37].

Further, occupationally active cancer survivors who showed higher current work ability had an increased chance to continue working compared to those with low work ability. Several preceding studies explored the relationship between work ability and work-related outcomes in cancer survivors. For example, de Boer et al. (2008) concluded in a

**Table 4.** Multivariate time lag model for selecting predictors of work continuation at follow-up.

|                                               | Work continuation at follow-up |                      |
|-----------------------------------------------|--------------------------------|----------------------|
|                                               | Beta (SE)/OR (95% CI)          | p-value <sup>a</sup> |
| <i>Socio-demographics</i>                     |                                |                      |
| Age                                           | −0.01 (0.04)/0.99 (0.93–1.06)  | 0.757                |
| Education                                     |                                |                      |
| None/primary school/lower vocational          | Ref.                           |                      |
| Upper vocational education/university         | 0.45 (0.57)/1.56 (0.51–4.75)   | 0.433                |
| <i>Health-related characteristics</i>         |                                |                      |
| Tumor type                                    | Beta (SE)/OR (95% CI)          | p-Value <sup>a</sup> |
| Mamma                                         | Ref.                           |                      |
| Urinary tract                                 | −0.40 (0.69)/0.67 (0.18–2.59)  | 0.565                |
| Urogenital (male)                             | −2.63 (1.31)/0.08 (0.01–1.10)  | 0.060                |
| Respiratory tract                             | −0.51 (1.18)/0.60 (0.06–6.04)  | 0.663                |
| Treatment modalities                          |                                |                      |
| Radiotherapy/No                               | Ref.                           |                      |
| Yes                                           | 0.57 (0.52)/1.76 (0.64–4.86)   | 0.274                |
| Hormonal therapy/No                           | Ref.                           |                      |
| Yes                                           | 0.84 (0.51)/2.32 (0.85–6.35)   | 0.102                |
| Physical dimension score (SIP)                | −0.02 (0.05)/0.98 (0.89–1.07)  | 0.628                |
| Quality of life (EORTC QLQ-C30)               |                                |                      |
| Physical functioning                          | 0.01 (0.02)/1.01 (0.98–1.04)   | 0.491                |
| Financial impact                              | −0.01 (0.01)/1.00 (0.99–1.01)  | 0.843                |
| Summary score                                 | 0.01 (0.02)/1.01 (0.98–1.04)   | 0.609                |
| <i>Work-related characteristics</i>           |                                |                      |
| Work ability (WAI)                            | Beta (SE)/OR (95% CI)          | p-Value <sup>a</sup> |
| Current work ability                          | 0.38 (0.14)/1.46 (1.11–1.92)   | 0.007                |
| Work ability related to physical work demands | −0.25 (0.32)/0.78 (0.41–1.47)  | 0.442                |
| Experience and judgement of work (VBBA)       |                                |                      |
| Need for recovery                             | 0.00 (0.01)/1.00 (0.99–1.02)   | 0.753                |

EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30; OR: odds ratio; Ref.: reference category; SE: standard error; SIP: Sickness Impact Profile; VBBA: Dutch questionnaire on Experience and Judgement of Work; WAI: Work Ability Index.

<sup>a</sup>For the multivariate generalized estimating equations analysis, a cutoff for p-values of 0.05 was used.

prospective study that self-assessed work ability is an important factor in the RTW process of cancer survivors, independent of age and clinical factors [38]. Also, Böttcher et al. (2013) found that limited self-assessed work ability increases the probability of not returning to work [39]. Up to now, however, there was a remarkable lack of scientific evidence regarding the importance of self-perceived work ability in occupationally active survivors.

### Strengths and limitations

This is the first prospective study examining changes in employment status and HRQoL in cancer survivors, and examining predictors of work continuation in occupationally active survivors up to four years after diagnosis. An additional strength is that a sample was drawn from the entire Dutch working population. However, a limitation of this study is the use of the registry of the SSA, in which data of workers on long-term sick leave is primarily gathered. This may have caused selection bias, as cancer survivors who were able to fully return to their former workplace before the baseline measurement of the original cohort study, are not represented in this study. Further, the sample had an uneven distribution related to gender and diagnosis. That is, two third of the respondents was female and half of the total study population reported a diagnosis of breast cancer. Finally, the generalizability of the results of this study may be limited because of the inclusion of cancer survivors therapeutically at work. On the one hand, therapeutic work is a frequently applied short-term arrangement for sick-listed employees in the Netherlands. It is part of the re-integration

process and involves a gradual build-up of workload and working hours. On the other hand, therapeutic work is being applied in many countries, using a range of different terms for more or less the same intervention: partial or part-time sick leave, adaptation in working hours, graded work exposure, and partial or therapeutic work resumption [40,41].

### Implications for research and practice

Up to now, research attention has been predominantly directed at evaluating RTW programs, and occupational health care at guiding cancer survivors in vocational rehabilitation. However, there is a lack of both scientific and professional support for the majority of the survivors, i.e., those who are able to continue working long term after diagnosis. Intervention programs should be developed and implemented to accomplish sustained employability and to prevent a negative change in employment status of occupationally active cancer survivors. Moreover, special attention should be given, both in research and in practice, to self-perceived work ability of survivors, beyond their initial RTW.

### Conclusions

Cancer survivors ‘continuously working’ are better off, regarding functioning, health and QoL, than those who are not able to work. However, in occupationally active cancer survivors, one should monitor those with low self-perceived work ability, because they have an increased risk to discontinue their work. Such a negative change in employment status

has shown to deteriorate health and QoL, to levels even lower than cancer survivors 'continuously not working'.

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