Summary
Over the last decades, the incidence of cancer has grown. Fortunately, due to advances made in medicine, e.g., screening programs and improvement of treatment modalities, the number of cancer survivors has increased as well. Simultaneously, the number of cancer survivors of working age has grown. In the Netherlands, the majority of cancer survivors of working age succeeds in return to work (RTW) prior to the maximum term of 24 months sick leave, but still, each year, over 4,200 sick-listed workers with a diagnosis of cancer have to apply for a work disability benefit. These work disability claims are processed by the Social Security Agency, for which insurance physicians (IPs) assess functional abilities and their sustainability. At times this can be difficult in cancer survivors, as IPs may find it hard to assess symptoms, such as distress, pain or fatigue. Data provided by the Netherlands Cancer Registry, related to the incidence and prevalence of cancer, indicate that the number of cancer survivors of working age will continue to grow over the coming years. Consequently, the number of cancer survivors that need to apply for a work disability benefit is expected to increase as well.

As cancer survivors are at risk for job loss, unemployment, and work disability, this thesis addresses work participation of these survivors at 24-month sick leave and beyond. In cancer survivors, work participation, next to providing an income, may help to regain self-confidence, overcome side-effects and lead the way back to former life. Therefore, there is a need to enhance work participation of cancer survivors on long-term sick leave (first objective). Simultaneously, there is a need to support IPs in assessing work disability claims of cancer survivors (second objective). These objectives were addressed by the identification of predictive factors for cancer-related fatigue (CRF) and work ability in cancer survivors on long-term sick leave. Specifically, CRF and work ability were studied, as both topics relate to work participation in cancer survivors. That is, CRF is a very common symptom in cancer survivors that can negatively influence all aspects of functioning, including working life, and may last a long time. Likewise, work ability in cancer survivors can be reduced due to side-effects of treatment, that may also last for several years or even be permanent. Knowledge of predictors of CRF and work ability in cancer survivors on long-term sick leave may help to identify those at risk for work disability, and support cancer survivors in vocational rehabilitation and RTW. Next,
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it may support IPs in assessing work disability claims of cancer survivors, enhance uniformity in these assessments and add to the quality of care.

In order to meet the two objectives, the following research questions were posed:

Question 1: Which factors are known to predict RTW in cancer survivors on long-term sick leave?

Question 2: Which factors are associated with work disability in cancer survivors at 24-month sick leave?

Question 3: Which factors predict CRF and work ability in cancer survivors at long-term follow-up, after the assessment of work disability?

Question 4: Which factors do IPs consider in assessing CRF and abilities in cancer survivors at 24-month sick leave?

The first research question is addressed in Chapter 2, in which a systematic review on predictors of RTW and employment in cancer survivors is presented. The objective of this study was to provide an overview of the prognostic factors for RTW and employment of cancer survivors. Longitudinal prospective cohort studies were selected if the population consisted of cancer patients between 18 and 65 years of age, with RTW, employment or equivalent concepts as main outcome measure, studying at least one prognostic factor. The methodological quality of the included studies and level of evidence for each prognostic factor were assessed. Twenty-eight cohort studies met the inclusion criteria. Heavy work and chemotherapy were negatively associated with RTW, whereas less invasive surgery was positively associated with RTW. Also, breast cancer survivors had the greatest chance to RTW. Old age, low education and low income were negatively associated with employment.

The second research question is addressed in chapter 3 and 4. In Chapter 3, the results of a quantitative secondary data analysis describing prognostic factors of work disability at 24-month sick leave in employed cancer survivors are presented. The study targeted factors present at short-term sick leave, i.e., 10 months. Timely knowledge of prognostic factors of work disability may support cancer survivors in their trajectory of vocational rehabilitation. A cohort of sick-listed employed cancer survivors was followed for 24 months. Included participants were aged between 20
and 63 years. Data were collected, using questionnaires, at 10 months after reporting sick. The level of work disability was assessed by an IP and a labour expert at 24-month sick leave. Univariate and multiple logistic regression analyses were performed. Analysis showed that, at 10-month sick leave, negative perception of health care providers on cancer survivors’ work ability and little experienced influence on RTW, both as reported by respondents, were associated with increased risk for work disability at 24 months.

In Chapter 4, the results of a cross-sectional study on factors associated with work disability in employed cancer survivors at 24-month sick leave are presented. Identification of factors associated with work disability in cancer survivors on long-term sick leave may support these survivors in choosing effective measures to facilitate vocational rehabilitation and RTW. Therefore, this study aimed to disclose factors associated with work disability in cancer survivors at 24-month sick leave. The study population consisted of employed sick-listed cancer survivors, aged between 18 and 64 years. They received a questionnaire at 24-month sick leave, the maximum period of sick leave allowed by Dutch social security legislation. Data were linked with the outcome of work disability assessments, as performed by the Dutch Social Security Agency. A hierarchical multivariate logistic regression analysis was performed to identify factors associated with work disability. At 24-month sick leave, increased risk for work disability was associated with Dutch nationality, higher education, hormone therapy, metastatic disease, high level of sickness impact, and low work ability.

Chapter 5 targets the third research question, in which the results of a prospective cohort study on predictive factors for CRF and work ability in cancer survivors beyond 24-month sick leave are discussed. The aim of this study was to identify prognostic factors related to both CRF and work ability in cancer survivors on long-term sick leave. Participants were between 18 and 64 years of age, had a first diagnosis of cancer, applied for a work disability benefit, and approached a 24-month sick leave term. Questionnaire data with a baseline measurement at 24-month sick leave with a follow-up measurement after 12 months, and register data of the Dutch Social Security Agency, were used. Univariate and multivariate linear regression analyses were applied to identify predictors. A higher level of fatigue
was associated with being divorced or widowed, a higher level of sickness impact, having depressive symptoms, and working in health care. A lower level of fatigue was associated with having received chemotherapy and lower fatigue at baseline. A higher score on work ability was associated with having received chemotherapy, better global health and better work ability at baseline. A lower work ability was associated with being principal wage earner, uncertainty related to being free of disease, a higher level of sickness impact, and higher level of wage loss.

In Chapter 6, the results of a study describing the mediating role of coping between self-reported health complaints and functional limitations, self-assessed work ability and work status of long-term sick-listed cancer survivors are presented. The purpose was to investigate the possible mediating role of active and passive coping between self-reported health complaints and functional limitations, as assessed by an IP, self-assessed work ability, and work status in cancer survivors on long-term sick leave. Validated questionnaires were used for self-reported health complaints, work ability and work status. The functional limitations of the respondents were transformed into scales for mental and physical limitations, and limitations in working hours. Using Lisrel, a structural model was tested, in which only for active coping a mediating role was found.

Finally, in Chapter 7, the fourth research question was addressed. In this chapter, the results of a qualitative study, that describes IPs’ perspectives related to the work disability assessment of cancer survivors, are discussed. Work disability assessment of cancer survivors is a complex decision making process. In the Netherlands, IPs play a key role in assessing work disability of cancer survivors on long-term sick leave. In this study, the aspects IPs consider in assessing work disability of cancer survivors and their experiences related to the use of guidelines are described. The study also addresses IPs’ needs related to the use of a prediction rule that targets to support work disability assessments in cancer survivors. A total of 29 IPs participated in this qualitative study. Three consecutive focus group interviews were held, using a predetermined topic list. The interviews were recorded, transcribed, and then independently analysed using standard procedures of thematic analysis. The IPs felt responsible for correct assessment of cancer survivors’ work disability, in which predominantly medical factors were investigated. Next, non-medical factors
related to the person, work and/or social environment were considered. Guideline adherence, e.g., to the guidelines on colorectal cancer and breast cancer, proved to be diverse. Related to the use of a prediction rule, its influence on communication with other stakeholders was addressed as an important issue. Furthermore, IPs thought a prediction rule should be valid, reliable and easy to use.

In Chapter 8, the main findings of the separate studies are discussed and linked in order to meet the two objectives of the thesis, i.e., to both enhance work participation of cancer survivors and support IPs in assessing work disability of cancer survivors. Results related to the research questions show that factors, such as job demands, health condition, RTW expectations and support from other stakeholders, are factors associated with work participation of cancer survivors. Some of the identified factors, e.g., poor health, older age, RTW expectations, or low education, seem generic, applicable to all sick-listed workers, irrespective of diagnosis. However, in the work disability assessment of cancer survivors, IPs initially seem to address disease-related aspects, and next question aspects of role functioning, in order to decide on functional abilities and their durability. A diagnosis of cancer may come along with a wide range of limitations in functional abilities, depending on site, stage, side-effects of treatment, and course of the disease. Therefore, next to generic factors that relate to work participation, IPs should specifically question disease-related factors, in which the use of evidence-based guidelines may be supportive. Related to the course of fatigue and work ability beyond 24-month sick leave, socio-demographics, health characteristics and job demands showed to be relevant predictive factors. Based on this information, a prediction rule that targets work ability in cancer survivors beyond 24-month sick leave may support the choice of initiating a vocational rehabilitation trajectory and/or plan a future reassessment.

**IMPLICATIONS FOR RESEARCH, PRACTICE AND POLICY**

Results of this thesis stress the need for large scale RTW intervention studies in cancer survivors. Also, researchers should make an effort to converge the
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design of studies, and consider using uniform outcome measures. Next, validation
and development of prediction rules in insurance medicine need more attention,
and research on vocational rehabilitation in cancer survivors should also address
unemployed workers. During the first year of sick leave, early identification of
factors associated with work participation may support a timely and adequate
vocational rehabilitation of cancer survivors. Knowledge of these factors is also
a necessary condition to, at later stage, assess work disability claims of cancer
survivors correctly and judge durability of functional abilities. Related to work dis-
ability assessments in cancer survivors, the use of guidelines, prediction rules and
continuing education of all IPs should be advocated. It may enhance uniformity of
assessments and add to the quality of care. The consequence of using a prediction
rule that targets work ability, would be to develop a policy that offers vocational
rehabilitation for those in need for support. Cancer survivors may benefit if, in
clinical medicine, more attention is given to their working life.